



BA Group

50 SPEERS ROAD PROPOSED RESIDENTIAL DEVELOPMENT VERSION 2 UPDATED TRAFFIC IMPACT STUDY

Town of Oakville

Prepared For: Helberg Properties Limited

February 2024



© BA Consulting Group Ltd.
95 St Clair Avenue West, Suite
1000 Toronto, ON M4V 1N6
www.bagroup.com

February 28, 2024

Paul Barrette

Manager - Planning, Current Planning - West District
Planning Services
Town of Oakville

RE: Responses to Town and Region Comments, Proposed Development at 50 Speers Road, Oakville, Halton Region

Dear Paul,

BA Group has been retained by Helberg Properties Limited to provide transportation consulting services related to a development proposal for 330 purpose-built residential rental units on a site municipally known as 50 Speers Road (“the site”), in the Town of Oakville (“the Town”), in the Region of Halton (“the Region”). The site is located on the south side of Speers Road and is bounded by the two-way Speers Service Road (“Service Road”) that connects to Speers Road to the north, a multi-unit residential development to the east, a parking lot to the west, and single-family homes along Bartose Drive and Oakwood Public School to the south. The development proposal includes the demolition of the existing residential building and the construction of a new residential building with 330 purpose-built residential rental units.

BA Group’s Traffic Impact Study (TIS) has been updated to respond to the Town and Region comments and prepared as part of the **Official Plan Amendment (OPA) and Zoning By-law Amendment (ZBA)** application being submitted to the Town of Oakville.

The attached letter provides BA Group’s responses to the Town and Region transportation-related comments provided on March 14, 2023, for the First Submission of the Official Plan Amendment (OPA) and Zoning By-law Amendment (ZBA) application to the Town for the redevelopment of 50 Speers Road.

We trust that the following information is satisfactory.

Sincerely,

BA Consulting Group Ltd.



Deanna Green, MSc. P.Eng.
Senior Associate

TOWN OF OAKVILLE COMMENTS

1. Planning Services, Current Planner

Comment 5. Site Access: The subject site does not have access to a full moves signalized intersection. The Town's transportation engineer (Syed Rizvi) has been in contact with BA Group regarding potential improvements to Speers Road, which could improve operation of the existing shared access, and improve safety sightlines, which was a concern raised by the public at the statutory public meeting. Please updated the TIA to investigate these measures. Any recommended improvements will need to be reviewed by staff then detailed in a future recommendation report.

Response:

BA Group's February 2024 Updated Traffic Impact Study (TIS) has been revised to include further analysis for left-turning vehicles at the Site access driveways along Speers Road. In addition, an analysis of possible options for potential improvements to Speers Road was undertaken that considered the following: 1) the existing turning movements at the existing "Service Road", 2) the existing constraints associated with the adjacent properties and 3) the available right-of-way. Based on this analysis, modifications to the west Service Road intersection with Speers Road, that will improve the level of safety for left-turning vehicles travelling in/out of the Service Road, are being recommended and proposed by the developer. The proposed modifications include restricting movements to right-in/ right-out only at the west access on Speers Road. An unsignalized access with full movements permitted, would be maintained at the east intersection of the Service Road with Speers Road. The level of safety related to left-turning vehicle movements from the Site and from the neighbouring 30 and 80 Speers Road properties, would be improved by ensuring that all left turns occur at the east Service Road intersection on Speers Road, which has the optimal geometry to accommodate left turns.

The updated traffic analysis demonstrates that all left turns can be accommodated at the east Service Road intersection can be found in Section 9.0 of the BA Group's February 2024 Updated Traffic Impact Study (TIS). A plan that illustrates the proposed modifications to the west intersection to restrict movements to right-in right-out is provided in Appendix K.

It is noted that options for making the Service Road one-way were also considered as part of BA Group's assessment. However, based on BA Group's review of the operational needs, it was concluded that the Service Road must remain two-way in order to appropriately accommodate the various service vehicles e.g. garbage trucks coming to/from the site and adjacent buildings. Two-way traffic is also required to ensure vehicles can access the east Service Road intersection which is where left-turn movements are recommended to be accommodated.



Comment 6. Transit-Supportive Development: The subject site is in proximity to the Oakville GO station, as well as five (5) local Oakville Transit routes. Given this accessibility, the location of the subject land within a growth area, as well as Halton Region and Town transportation objectives, the TDM strategy is particularly important. In addition to the measures outlined in the TIS additional TDM measures should be considered: For example:

- a. Communicate to tenants that discounted transit passes are available for customers as part of the low-income transit (SPLIT pass) through Halton Region. In addition, other incentives include kids under 12, ride free, the \$20 freedom pass for youth for unlimited rides after 4 PM and on weekends, seniors ride free on Mondays, as well as free (100% discount) Oakville Transit co-fare trips when transferring between Oakville Transit and the Oakville GO (see presto / GO Transit). This information could be made available to tenants, to incentivize transit use.
- b. Given the proposed reduction in parking, consider including car-share parking / providing this service for tenant use, as an alternative to owning an automobile. The car share parking space(s) could be provided in visually prominent and accessible location.
- c. If the provided tenant parking is being charged separately from the unit, consider a cost of parking which exceeds or equals equivalent transit fare(s).

Response:

BA Group's February 2024 Updated Traffic Impact Study (TIS) has been revised to include the provision of information to tenants to incentivize transit use and one at-grade car-share space near the main entrance. In addition, the developer has committed to considering that the cost of renting a monthly vehicle parking pass in the building could be equal to, or greater than, the cost of a monthly transit pass. Please see Section 7.0 of the revised BA Group report.

Comment 8. Public / Council Input: Council directed that analysis of the following matters of interest to Council be included as part of the recommendation report:

- a. review and provide an evidence-based analysis of the proposed reduction of the minimum parking ratio and identify an appropriate minimum amount of dedicated visitor parking.
- ...c. review transportation considerations, including a complete assessment of the transportation study, turning movements from Speers Road and within the 'service road', potential improvements to Speers Road and/or the 'service road', and impact on area road and intersection capacity.

Response:

Since the first submission, changes to the proposed parking supply have been made. Section 4.0 of the BA Group February 2024 Updated Traffic Impact Study (TIS), outlines the proposed changes as part of a revised



parking assessment. The primary change to the proposed parking strategy is that separate parking rates are proposed for resident parking and dedicated visitor parking.

Application of the Town's Zoning By-law 2014-014 requires a minimum of **270 resident parking spaces (0.82 spaces/unit)** and a minimum resident visitor supply of **82 spaces (0.25 spaces/unit)**. The proposed resident parking supply of **280 spaces (0.85 spaces/unit)** exceeds the minimum Zoning By-law requirements by 10 spaces. The proposed resident visitor parking supply of **50 spaces (0.15 spaces/unit)** is 32 spaces less than required by the Zoning By-law. The report includes justification for the proposed resident visitor parking reduction.

With respect to the comment pertaining to reviewing potential improvements to Speers Road, as noted above, the revised application now includes recommended and proposed modifications to the west intersection of the Service Road that would restrict access to right-in/ right-out only. Full moves would be retained at the east intersection and all left turns to/from the Site would be accommodated at the east access of the Service Road at Speers Road. The proposed improvements will improve the level of safety at the Service Road intersections. The revised BA Group February 2024 Updated Traffic Impact Study (TIS) has been revised accordingly.

3. Development Services, Development Engineer

General Comments

Comment 1. Please confirm with the roads and corridors group if a road widening is required. If so, the ESA will need to be reviewed for land conveyance purposes. Please contact Vince Blosser for additional info.

Response:

A road widening of Speers Road, in the vicinity of the Site, will not be required as part of the safety-related improvements proposed as part of the development proposal. The revised development proposal includes a modification to the Speers Road "Service Road" to restrict the west intersection to right-in/ right-out only. This will improve the level of safety as left-turning conflicts will be eliminated at the west access as all left turns to/from the Site will occur at the east access on Speers Road, which has appropriate road geometry for accommodating left turns.



5. Transportation Services, Transportation Engineer

General Comments

Updated TIS Scope of Work

Comment. In February 2022, Metrolinx advised the Town of Oakville that the Kerr Street Grade Separation has been deferred indefinitely. At this time, there is no projected construction start date and no confirmation that the grade separation and widening of Kerr Street and intersection improvements will be proceeding or whether interim or alternative measures (such as the closure of the level crossing) may be required by the Province. Therefore, the 50 Speers Road Transportation Analysis needs to be updated to review and analyze the transportation impacts of the subject application based on potential conditions in the horizon years of 2026 and 2031.

The following scenarios are to be included in the updated TIS:

1. Grade separation, road widening, intersection improvements, turning lanes, and active transportation infrastructure in place by 2026 and 2031.
2. Grade separation and associated improvements deferred beyond 2031 and 2036.

Response:

The traffic analysis within BA Group's February 2024 Updated Traffic Impact Study (TIS), has been updated to include the following scenarios:

- 1) Grade separation, road widening, intersection improvements, turning lanes, and active transportation infrastructure in place by 2026 and 2031.
- 2) Grade separation and associated improvements **deferred beyond 2031 and 2036.**

The revised analysis can be found in Section 9.0 of BA Group's attached February 2024 report. As per the findings of that analysis, it was determined that the impacts of the Site are small and can be accommodated in all the scenarios. The future grade separation and improvements to Kerr Street are therefore not required to accommodate the Site.

Transportation Planning

Comment 1. Site Access – Reference TIS Section-1, the access to the site is proposed with a new driveway that connects to the existing two access points (west access & east access) at Speers Road. The subject lands do not have access to a signalized full moves intersection, nor is one planned due to the proximity to the Speers Rd. / Kerr St. signalized intersection. It is noted that under the existing conditions delays related to north bound left-turning movement, and west bound left-turning movement is observed during site visit and reported in TIS. It is expected that with future growth planned within study area the traffic volumes would increase on Speers Road corridor. The proposed density increase will also increase the number of trips to and from the subject lands. As a result, the left-turning drivers in future will experience increase in delay and encounter safety issues while finding gaps on Speers Road.



To address access the foregoing, and the related issue raised during P&D council meeting by the Council and public, the TIS is required to be updated to:

- a) Propose mitigation measures including adding a two-way left turn lane (TWLTL) on section of Speers Road in front of the 50 Speers Road property. The engineering roadway drawing of the section of Speers Road are provided to the BA Group through email by the undersigned.
- b) Review sightlines of the existing access configuration.
- c) Investigate whether the crescent should be modified to a one-way configuration.
- d) Investigate whether the existing transit stop adjacent to the western leg of the crescent should be shifted to within the crescent to improve sightlines while a transit vehicle is parked picking up passengers.
- e) Any other options to improve safety and turning movements.

Response:

As discussed with Town staff, based on a review of the Town's planned road widening projects, the Town's current design to upgrade/widen the Speers Road/Kerr Street intersection does not include any scope for modifying Speers Road in front of the 50 Speers Road property. As a result, the installation of a two-way left-turn lane would require a road widening, and a two-way left-turn lane on Speers Road cannot be accommodated at this time. In an effort to improve sightlines however, the development proposal now includes a plan to modify the Service Road adjacent to the Site by restricting the west intersection with Speers Road to right-in/ right-out only. Full access is proposed to be maintained at the east Service Road intersection with Speers Road. In order to improve the level of safety, all left turns to/from the Site will therefore be directed to use the east intersection where they can be appropriately accommodated.

The sightline evaluation at the proposed points of access on Speers Road has been updated and sightline diagrams have been provided in Appendix J of BA Group's February 2024 Updated Traffic Impact Study (TIS). The evaluation confirmed that sightlines are appropriate at both the east and west access driveways on Speers Road.

As part of BA Group's review of options to improve the level of safety for left-turning vehicles, it was determined that the Service Road needs to remain as a two-way operation in order to accommodate service vehicles such as garbage trucks. Moreover, the recommended restriction of the west intersection to right-in/right-out necessitates the Service Road to remain two-way in order to ensure travellers can access the east intersection to make left turns.

The location of the existing transit stop has been reviewed. In reviewing this comment it is our understanding that the concern over the existing bus stop location is the potential for a bus stopping at the existing stop blocking the view of outbound motorists trying to make a left turn from the west Service Road Driveway onto Speers Road. Therefore in light of the proposed modifications to eliminate left turns from the west intersection, the issue of buses blocking sightlines for outbound drivers is no longer applicable. As such, it is recommended that the existing transit stop remain in the current location as moving it further east would only serve to reduce the sight distance available for outbound left-turning vehicles at the east driveway, which is the most desirable location for accommodating left turns.

Comment 2. Site Trip Generation and Proposed Parking Supply Ratio – The site plan drawing shows 9 townhouses (TH's) attached to the high rise building on the plan, the applicant should confirm the ITE Trip Generation LUC applied to calculate the trips generation and parking demand calculation for the TH component of the proposed plan.

Response:

The “townhouse” units labelled in the application are not townhouses per the definition of a Townhouse. A townhouse generally has a front door with independent access. Rather, the proposed “townhouse” units are actually a unit within the building that have an exterior at-grade patio area. And while each “townhouse” unit includes an exterior patio entrance, the main front door entrance for each unit is through the building’s common lobby. As such the “townhouses” within the plan are actually consistent with the characteristics of the other multi-bedroom residential units being proposed for the Site. Thus for these reasons, the consistent vehicle trip rates parking rates have been considered for all 330 proposed residential units, inclusive of the 13 grade related units.

Comment 3. Parking Plan – Reference section-5 of the TIS report there is deficiency of 26 parking spaces at the proposed site. Considering the mixed land use plan, and existing site requirement, the applicant should add parking spaces required as per zoning by-law and submit the parking plan for review and comments by transportation planning.

Response:

BA Group’s February 2024 Updated Traffic Impact Study (TIS) includes a revised parking assessment (Section 4.0) that proposes separate parking rates for resident parking and dedicated visitor parking. Application of the Town’s Zoning By-law 2014-014 requires a minimum of **270 resident parking spaces (0.82 spaces/unit)** and a minimum resident visitor supply of **82 spaces (0.25 spaces/unit)**. The proposed resident parking supply of **280 spaces (0.85 spaces/unit)** exceeds the minimum Zoning By-law requirements for resident parking by 10 spaces. The proposed resident visitor parking supply of **50 spaces (0.15 spaces/unit)** is 32 spaces less than required by the Zoning By-law, however as per Section 4.0 of BA Group’s February 2024 Updated Traffic Impact Study (TIS), the proposed visitor parking supply rate of 0.15 spaces per unit is consistent with the observed visitor parking demand at comparable buildings. Therefore the proposed visitor parking supply is appropriate.

Comment 4. Visitor Parking Plan - The underground parking level drawing shows that there is no separation provided between visitor and resident parking area. For the safety and security of the building residents, the applicant should update the underground parking plan to show a barrier/security gate to separate the visitor from resident parking. The revised parking plan should be resubmitted for review and comments by Transportation Planning.



Response:

The updated site plan drawings illustrate a clear separation between visitor parking and resident parking. All visitor parking is proposed to be provided on P1, with the exception of 2 visitor spaces to be provided at-grade.

HALTON REGION COMMENTS

Waste Management

Turning Radius

Comment. Halton Region requires a minimum 13 metre turning radius from center line. A 13 metre center line turning radius is not indicated on any plans. Please confirm the minimum turning radius has been met. Please submit a detailed vehicle traffic plan to clarify the turning radius, length of the head-on approach (minimum 18 metre), and the length the truck will be required to reverse. Additionally, please also note the turning radius on an “auto turn” plan or the site plan.

Please note a flashing light with signs and a warning system must be implemented to alert drivers coming from the underground garage when the collection vehicle is backing out of the loading space to exit the area. The Owner should provide a response to the above.

Response:

As discussed with the Region during a meeting on January 23, 2024, a 13 metre turning radius can be achieved for garbage trucks entering and exiting the proposed the loading along the outer edge of the vehicle turning envelope. This arrangement was confirmed through an updated vehicular manoeuvring analysis undertaken by BA Group. The turning radius of 13 metres has been included and annotated on the updated vehicle manoeuvring diagrams as requested.

Additionally, the plans have been updated to include annotation of the required 18 metre long ‘head-on approach’. This is illustrated on the figure (SPR-01) provided in Appendix C of BA Group’s February 2024 Updated Traffic Impact Study (TIS). Note that the proposed 18 metre head-on approach includes a portion (4.5 metres) of the east-west site driveway adjacent to the loading area that leads to parking ramp. The use of a portion of the adjacent private driveway for the 18 metre head-on area is appropriate in this instance based on the following:

- sufficient space within the 18m head-on length will still be available to manoeuvre the truck back and forth within the loading area while collecting waste bins;
- the driveway adjacent to the loading area is not a continuous road (it only provides access to the underground parking) and as such the waste collection operations will not conflict with any significant traffic; and



- increased safety measures are proposed in the Site plan to mitigate the conflict between the loading area and parking ramp, namely convex mirrors are proposed at the intersection of the parking ramp (allowing vehicles to be seen), and a warning system with flashing lights and signs is proposed to alert drivers exiting from the below-grade parking facility when the collection vehicle is backing out of the loading space to exit the area.

Lastly, it is confirmed that the maximum distance that a garbage truck would need to reverse along the private Site driveway is 7.0 metres. This is illustrated in Appendix C of BA Group's February 2024 Updated Traffic Impact Study (TIS).

Vertical Clearance – Shared Loading

Comment. The plans indicate where the collection point will be located which appears to be internal to the building. The loading area indicated that a 7.5 metres overhead clearance is required. It is confirmed there will be a 7.5 metres overhead clearance in the loading area. Please submit a scaled drawing indicating how the bins will be configured including dimensions, grade, waste receptacle placement, and proposed doors. Please note this should be shown in the staging area. The Owner should consider and provide a response to the following:

- Please confirm that there is sufficient space for a Front End collection truck and a side Loader collection truck to operate safely.
- Occupants of the vehicle must be able to open both doors and exit the vehicle, and be able to walk the perimeter of the vehicle unhindered. Ensure there is sufficient space to accommodate the length of the truck with the forks extended to carry out waste collection of all waste receptacles.
- The vertical clearance required for loading Regional collection vehicles is 7.5 metres. The required loading area width is 6 metres.

Response:

As illustrated in the vehicle maneuvering diagrams (VMD's) in Appendix C of BA Group's February 2024 Updated Traffic Impact Study (TIS), there is sufficient space for either a front-end collection truck or a side loader collection truck to operate effectively within the proposed loading area. The VMD's also include an illustration of the location of the waste bin arrangement on collection day. Notably it is proposed that full bins would be located along the west wall of the loading area when the truck arrives thus providing space along the east wall to accommodate the vehicle manoeuvre. The bins would then be emptied and the empty bins would be shifted to the east wall to facilitate the reversing / exit manoeuvre of the waste collection truck.

The loading area will permit occupants of the vehicle to open both doors and exit the vehicle and walk the perimeter of the vehicle unhindered. There is sufficient space to accommodate the length of the truck with the forks extended to carry out waste collection of all waste receptacles.

The loading area meets the Region's requirements with a vertical clearance of 7.5 metres and a loading area width of 6 metres.

TABLE OF CONTENTS

Executive Summary	9
1.0 INTRODUCTION	12
1.1 Existing Site Context	12
1.2 Development Proposal	12
1.3 Study Scope	16
2.0 POLICY & PLANNING CONTEXT	17
2.1 Relevant Policies of the Town of Oakville Official Plan – Livable Oakville	18
2.1.1 Livable Oakville – Growth Areas – Kerr Village	18
2.1.2 The Plan for Kerr Village (2009)	19
2.1.3 Summary	20
3.0 TRANSPORTATION CONTEXT	23
3.1 Area Road Network	24
3.1.1 Existing Area Road Network	24
3.1.2 Planned Road Network Improvements	27
3.2 Area Transit Network	29
3.2.1 Existing Transit Network	29
3.2.2 Planned Transit Network Improvements	32
3.3 Area Cycling Network	33
3.3.1 Existing Cycling Network	33
3.3.2 Future Area Cycling Network Improvements	33
3.4 Area Pedestrian Context	35
4.0 VEHICLE PARKING CONSIDERATIONS	37
4.1 Updates Since Previous Submission	37
4.2 Zoning By-law Requirements	37
4.3 Proposed Parking Supply	38
4.4 Adequacy of Proposed Visitor Parking Supply	38
4.4.1 Transportation Planning Principles	38
4.4.2 Existing and Evolving Transportation Context	39
4.4.3 Approved Reduced Resident Visitor Parking Rates	39
4.4.4 Proxy Site Observed Visitor Parking Demand	41
4.4.5 Existing Site - Observed Parking Demand	42
4.4.6 Proposed Transportation Demand Management Measures	42
4.5 Proposed Parking Strategy	42
4.5.1 Summary of Proposed Parking Supply	43



4.5.2	Accessible Parking.....	44
5.0	BICYCLE PARKING CONSIDERATIONS.....	44
5.1	Zoning By-Law Requirements	45
5.2	Proposed Bicycle Parking Supply	45
6.0	LOADING CONSIDERATIONS.....	46
6.1	Zoning By-law Requirements	46
6.2	Proposed Loading Facilities	46
7.0	TRANSPORTATION DEMAND MANAGEMENT (TDM)	48
7.1	TDM Objectives	48
7.2	Proposed TDM Strategies.....	48
7.2.1	Reduced Parking Supply	48
7.2.2	Summary of Proposed TDM Strategies	49
8.0	TRAVEL DEMAND FORECASTS	51
8.1	Existing Traffic Volumes	51
8.2	Horizon Years	53
8.3	Background Traffic Volumes	53
8.3.1	Corridor Growth.....	53
8.3.2	Background Developments.....	53
8.3.3	Future Background Traffic	56
8.4	Site Traffic Volumes	59
8.4.1	Existing Site Traffic	59
8.4.2	Trip Generation	59
8.4.3	Total Site Vehicle Trip Forecast.....	60
8.4.4	Trip Distribution and Assignment.....	61
8.5	Future Total Traffic Volumes.....	61
9.0	UPDATED TRAFFIC OPERATIONS ANALYSIS	67
9.1	Study Area Intersections.....	67
9.2	Analysis Methodology and Assumptions	67
9.2.1	Intersection Capacity Analysis Methodology	67
9.2.2	Kerr Street Grade Separation Project Deferred.....	68
9.2.3	Overview of Traffic Analysis Scenarios.....	70
9.2.4	Safety-Related Improvements at Speers Road / Service Road Accesses	70
9.3	Traffic Analysis Summary	71
9.4	Signalized Intersection Analysis	71
9.4.1	Scenario #1 – All Planned Improvements Completed by 2026 and 2031	71
9.4.2	Scenario #2 – No Improvements in Place by 2026 and 2031	75



9.5	Unsignalized Intersection Analysis	80
9.5.1	Scenario #1 – All Planned Improvements in Place by 2026 and 2031	80
9.5.2	Scenario #2 – No Improvements in Place by the 2026 and 2031 Horizon	81
9.6	Traffic Signal Assessment on Speers Road	84
10.0	SAFETY ANALYSIS	85
10.1	Left-turn lane assessment.....	85
10.2	Sight Distance (From Speers Road Service Road)	86
10.3	Queuing Analysis	87
10.3.1	Scenario #1 Queuing Analysis.....	87
10.3.2	Scenario #2 Queuing Analysis.....	88
11.0	CONCLUSIONS AND RECOMMENDATIONS	93

LIST OF TABLES

Table 1	Development Proposal.....	13
Table 2	Existing Area Road Network.....	24
Table 3	Existing Area Transit Network.....	30
Table 4	Zoning By-law 2014-014 - Minimum Parking Requirements	37
Table 5	Proposed Parking Supply	38
Table 6	Area Approved Reduced Visitor Parking Supply Ratios	40
Table 7	Approved Reduced Visitor Parking Supply Ratios with Similar Transit Connections.....	40
Table 8	Visitor Parking Demand Studies - Proxies.....	41
Table 9	Summary of Visitor Parking Ratios	42
Table 10	Existing Residential Building Parking Demand (Rent Roll Data).....	42
Table 11	Proposed Parking Supply	43
Table 12	Zoning By-law 2014-014: Accessible Parking Requirements.....	44
Table 13	Zoning By-law 2014-014 - Minimum Bicycle Parking Requirements.....	45
Table 14	Summary of Parking Supply and Requirements.....	49
Table 15	TDM Strategies	49
Table 16	Existing Traffic Count Summary	51
Table 17	Summary of Background Developments	56
Table 18	Proxy Residential Vehicle Trip Generation Rate Review.....	59
Table 19	Residential Mode Share (TTS 2016)	60
Table 20	Vehicle Trip Generation	60
Table 21	Site Trip Distribution.....	61



Table 22	Lane Configuration Comparison	69
Table 23	Kerr Street / Speers Road Capacity Analysis Results	72
Table 24	Speers Road / Cross Avenue Capacity Analysis Results	73
Table 25	Kerr Street / Shepherd Road Capacity Analysis Results	74
Table 26	Kerr Street / Stewart Street Capacity Analysis Results	75
Table 27	Kerr Street / Speers Road Capacity Analysis Results	76
Table 28	Speers Road / Cross Avenue Capacity Analysis Results	77
Table 29	Kerr Street / Shepherd Road Capacity Analysis Results	78
Table 30	Kerr Street / Stewart Street Capacity Analysis Results	79
Table 31	Unsignalized Intersections Capacity Analysis Results	80
Table 32	Unsignalized Intersections Capacity Analysis Results	82
Table 33	Traffic Signal Warrants (2031): Speers Road/ Speers Service Road (East Access)	84
Table 34	TAC Minimum Sight Distance Requirements	86
Table 35	Queueing Analysis Summary – Scenario 1	90
Table 36	Queueing Analysis Summary – Scenario 2	92



LIST OF FIGURES

Figure 1:	Site Location	14
Figure 2:	Development Proposal.....	15
Figure 3:	Major Transit Station Areas (MTSA) near Oakville GO Station	21
Figure 4:	Kerr Village Growth Area	22
Figure 5:	Existing Area Road Network.....	25
Figure 6:	Existing Area Road Lane Configuration and Traffic Control	26
Figure 7:	Future Area Road Lane Configuration and Traffic Control	28
Figure 8:	Existing and Future Area Transit Network	31
Figure 9:	Existing and Future Area Cycling Network	34
Figure 10:	Existing and Future Area Pedestrian Network	36
Figure 11:	Existing Traffic Volumes	52
Figure 12:	Location of Background Development	54
Figure 13:	Background Development Traffic Volumes	55
Figure 14:	2026 Future Background Traffic Volumes	57
Figure 15:	2031 Future Background Traffic Volumes	58
Figure 16:	Existing Site Traffic Volumes to be Removed.....	62
Figure 17:	New Site Residential Traffic Volumes.....	63
Figure 18:	Net New Site Traffic Volumes	64
Figure 19:	2026 Future Total Traffic Volumes.....	65
Figure 20:	2031 Future Total Traffic Volumes.....	66



TABLE OF APPENDICES

Appendix A	Terms of Reference
Appendix B	Reduced Scale Architectural Drawings
Appendix C	Vehicle Manoeuvring Diagrams
Appendix D	Turning Movement Counts
Appendix E	Corridor Growth Analysis
Appendix F	TTS Data Queries
Appendix G	Existing Traffic Signal Timings
Appendix H	Synchro Worksheets
Appendix I	OTM Book 12 Excerpts
Appendix J	Sight Distance Assessment
Appendix K	Functional Design and Pavement Marking & Signage Plan



EXECUTIVE SUMMARY

BA Group was retained by Helberg Properties Limited to provide transportation consulting services related to a development proposal for 330 purpose-built residential rental units on a site municipally known as 50 Speers Road (“the site”), in the Town of Oakville (“the Town”), in the Region of Halton (“the Region”). The site is located on the south side of Speers Road and is bounded by the two-way Speers Service Road (“Service Road”) that connects to Speers Road to the north, a multi-unit residential development to the east, a parking lot to the west, and single-family homes along Bartose Drive and Oakwood Public School to the south. The site is currently occupied by a 7-storey residential building with 59 units. This Traffic Impact Study (TIS) has been updated to respond to Town and Region comments and prepared as part of the **Official Plan Amendment (OPA) and Zoning By-law Amendment (ZBA)** application being submitted to the Town of Oakville.

Development Proposal

The development proposal includes the demolition of the existing residential building and the construction of a new residential building with 330 purpose-built residential rental units. It is expected that site will most likely be build-out by 2027.

Site access is proposed with a new driveway that connects to the existing Service Road at the front of the building, with 2 existing access points along the Service Road at Speers Road. In order to improve the level of safety for left-turning vehicles travelling in/out of the Service Road at Speers Road, the updated site plan includes modifications to the west Service Road intersection with Speers Road that restricts movements to right-in/ right-out only. An unsignalized access with full movements permitted, would be maintained at the east intersection of the Service Road with Speers Road.

Vehicle parking for the site is to be provided within a new 3-level below-grade parking facility. One car-share space will be provided at-grade.

Area Transportation Context

The site is currently served by 5 local surface bus routes operated by Oakville Transit that provide connections to the higher-order GO Transit System. There are bus stops adjacent to the site on Speers Road (just west of the site and directly across the street on the north side of the road). The Oakville GO Station is located only 750 metres from the site.

A number of cycling infrastructure improvements are planned within the vicinity of the site. On-road cycling lanes are proposed along Speers Road (west of Cross Avenue), Kerr Street (north of Speers Road), Queen Mary Drive and Cross Avenue. On-road signed cycling routes are proposed on Kerr Street (south of Speers Road), Stewart Street, Maurice Drive and Speers Road (east of Cross Avenue). Multi-use trails on Dorval Drive are to be extended. In addition, a future grade-separated crossing is proposed at the intersection of Speers Road and Kerr Street.

The site is located in midtown Oakville which provides access to a number of commercial and employment uses within a reasonable walking distance. All public streets in the site vicinity (including Speers Road, Kerr Street, Bartos Drive, Shepherd Road and Prince Charles Drive) have continuous sidewalks on both sides of the roadway. Pedestrian connectivity between the site and Oakwood Public School will be provided through the property adjacent to the site (80 Speers Road) and the existing connection to the sidewalk along Bartos Drive. Both Speers Road and Kerr Street provide strategic connections within the Town of Oakville, connecting to key roads within the Town and Region. The Queen Elizabeth Way (QEW)/Highway 403 is less



than 2 km from the site. The proximity of the QEW will provide convenient access for vehicles travelling to and from the site.

Vehicle Parking Considerations

Since the first submission, changes to the proposed parking supply have been made. The primary change to the proposed parking strategy is that separate parking rates are proposed for resident parking and dedicated visitor parking. The updated application of the Town's Zoning By-law 2014-014 requires a minimum of 270 resident parking spaces (0.82 spaces/unit) and a minimum resident visitor supply of 82 spaces (0.25 spaces/unit). The proposed resident parking supply of 280 spaces (0.85 spaces/unit) exceeds the minimum Zoning By-law requirements by 10 spaces. The proposed resident visitor parking supply of 50 spaces (0.15 spaces/unit) is 32 spaces less than required by the Zoning By-law. The proposed parking supply is appropriated based on several factors such as the area transportation context, the proximity of the Oakville GO station (only 750 m from the site), consideration for Transportation Demand Management, parking demand surveys and recent parking approvals.

Bicycle Parking Considerations

The site is subject to the minimum bicycle parking requirements of the Town of Oakville Zoning By-law 2014-014. Application of the minimum bicycle parking requirements results in a requirement for 330 bicycle parking spaces, including 248 long-term spaces and 82 visitor spaces. The bicycle parking supply includes a total of 330 spaces and meets the requirements of the Zoning By-law.

Loading Considerations

The Town's Zoning By-law 2014-014, requires that the minimum dimensions of a loading space are: 3.5 m width, 12.0 m length and 4.2 m vertical clearance. A total of one loading space is proposed at-grade to accommodate the servicing needs of the residential development. The proposed loading facilities are appropriate will meet the practical needs of the site.

Transportation Demand Management Plan

The Transportation Demand Management (TDM) Plan strives to reduce automobile use through an on-going strategy that supports and promotes the use of non-auto transportation modes. Proposed TDM strategies include a reduced parking supply with "unbundled" parking, active transportation facilities (pedestrian connection, bike parking and bike repair station) and travel mode information packages. The TDM Plan has also been updated to include the provision of information to tenants to better incentivize transit use and one at-grade car-share space near the main entrance. In addition, the developer has committed to reviewing the cost of renting a monthly vehicle parking pass in the building that could be equal to, or greater than, the cost of a monthly transit pass.

Travel Demand

The TTS travel data demonstrates that the site study area has an auto driver mode share in the order of 57% for morning outbound and 64% for afternoon inbound home-based trips, during the peak travel periods. Non-auto trips (i.e. transit, walking and cycling) account for approximately 29% of all home-based trips made in the morning outbound and 28% in the afternoon inbound, during the peak travel periods. The proposed development is anticipated to generate in the order of **80 and 95 two-way vehicle trips**, during the weekday morning and afternoon peak hours, respectively. In consideration of the existing trips generated by the site, the development is forecasted to have a net impact of approximately **60 two-way vehicle trips**, during both the weekday morning and afternoon peak hours.



Traffic Operations Analysis

The traffic operations analysis was undertaken during the weekday morning and afternoon street peak hours for existing conditions and the horizons of 2026 and 2031. As per the Town's request, the following two scenarios were considered as part of the updated traffic analysis:

1. Grade separation, road widening, intersection improvement, turning lanes, and active transportation infrastructure **in place** by 2026 and 2031 horizon years.
2. Grade separation and associated improvement **deferred** beyond the 2031 horizon year.

As per the findings of the updated analysis, it was determined that the impacts of the site are modest and can be accommodated in both future scenarios. The future grade separation and improvements to Kerr Street are not required to accommodate the site. Overall, area signalized intersections operate well under existing conditions, with volume to capacity (v/c) ratios of less than 1.0 for all movements. Considering future traffic conditions with redevelopment of the site and the planned road network improvements at the Kerr Street / Speers Road intersection, all signalized intersections will continue to operate acceptably with (v/c) ratios of less than 1.0 for all movements in the future horizon years.

Traffic operations at all unsignalized intersections within the study area are at acceptable level of service under all scenarios, without the need for road improvements or mitigation measures. It is however noted that the intersection of Speers Service Road (East Access) / Speers Road, in the 2031 future total traffic condition, is expected to experience minor delays (approximately 53 seconds) for northbound left-turning vehicles during the morning peak hour. This delay is however deemed acceptable and expected in an urban environment at an unsignalized intersection during peak periods of travel. The delay for northbound left-turning vehicles may also be less due to gaps created by the nearby traffic signal at Kerr Street.

Road Safety Analysis

The traffic analysis for this study indicates that there are expected to be a future total maximum of 25 westbound left-turning vehicles from Speers Road to the east Service Road access, during the peak hours of the day. The level of safety related to left-turning vehicle movements from the site and from the neighbouring 30 and 80 Speers Road properties, would be improved by ensuring that all left turns occur at the east Service Road intersection on Speers Road, which has the optimal geometry to accommodate left turns. The sight distance for the two existing access points on the Service Road at Speers Road was evaluated based on Transportation Association of Canada (TAC) design criteria and confirmed that the access points meet the minimum sight distance requirements.

An analysis of the existing and projected future vehicle queues was undertaken at all signalized intersections in order to confirm that queues would be acceptably accommodated under the study horizon years. The results of the queuing analysis indicate that the development proposal is expected to have negligible impacts on intersection queuing in the study area. As a result, there are no safety-related concerns in relation to the development and intersection queuing in the study area.

Overall Conclusion

Based on the foregoing, the proposed development can be acceptably accommodated on the existing and future transportation network.



1.0 INTRODUCTION

BA Group was retained by Helberg Properties Limited to provide transportation consulting services related to a development proposal for 330 purpose-built residential rental units on a site municipally known as 50 Speers Road (“the site”), in the Town of Oakville (“the Town”), in the Region of Halton (“the Region”). The site is located on the south side of Speers Road and is bounded by the two-way Service Road that connects to Speers Road to the north, a multi-unit residential development to the east, a parking lot to the west, and single-family homes along Bartose Drive and Oakwood Public School to the south. The site is currently occupied by a 7-storey residential building with 59 units. The site location is illustrated in **Figure 1**.

This Traffic Impact Study has been updated as part of the **Official Plan Amendment (OPA) and Zoning By-law Amendment (ZBA)** application being submitted to the Town of Oakville. The terms of reference for the study was reviewed and approved by the Town of Oakville and is attached in **Appendix A**.

1.1 EXISTING SITE CONTEXT

The site is currently occupied by a 7-storey residential building with 59 units. The existing parking supply for the building includes a total of 67 spaces (39 below-grade spaces and 28 at-grade spaces). Vehicle access to the site is currently provided by a private driveway in front of the building that connects to the Service Road with two points of access to Speers Road.

1.2 DEVELOPMENT PROPOSAL

The development proposal includes the demolition of the existing 7-storey residential building and the construction of a new residential building with 330 purpose-built residential rental units. It is expected that site will most likely be build-out by 2027.






Site access is proposed with a new driveway that connects to the existing Service Road at the front of the building, with 2 existing access points along the Service Road at Speers Road. In order to improve the level of safety for left-turning vehicles travelling in/out of the Service Road at Speers Road, the updated site plan includes modifications to the west Service Road intersection with Speers Road that restricts movements to right-in/ right-out only. An unsignalized access with full movements permitted, would be maintained at the east intersection of the Service Road with Speers Road. The level of safety related to left-turning vehicle movements from the site and from the neighbouring 30 and 80 Speers Road properties, would be improved by ensuring that all left turns occur at the east Service Road intersection on Speers Road, which has the optimal geometry to accommodate left turns.

Vehicle parking for the site is to be provided within a new 3-level below-grade parking facility. One car-share space will be provided at-grade.

The development statistics for the site are summarized in **Table 1** while the development proposal for the site is illustrated in **Figure 2**. Reduced scale architectural ground floor and parking level plans are provided in **Appendix B**.



TABLE 1 DEVELOPMENT PROPOSAL

Use		Proposed	
 3-	Residential Rental Units	Studio	31 units
		1-bedroom	144 units
		2-bedroom	132 units
		3-bedroom	23 units
		Total	330 units
	Vehicle Parking spaces	Resident	280 spaces (0.85 spaces/unit)
		Non-Resident	50 spaces (0.15 spaces/unit)
		Total	330 spaces
	Car Share	Total	1 space²
	Bicycle Parking Spaces	Long Term (Resident)	248 spaces
		Short Term (Resident Visitor)	82 spaces
		Total	330 spaces
	Loading Facilities	One loading space	
	Site Access	Access to the pick-up/drop-off area, loading facility and ramp connection to the below-grade parking facility to be provided via a new private driveway that connects to the existing Service Road that connects to Speers Road (one right-in/right-out access on Speers Road and one full access on Speers Road).	

Notes:

1. Site statistics based on site plans prepared by BDP Quadrangle Architects dated February 2024.
2. Car share space is included within the count of the 280 resident spaces.



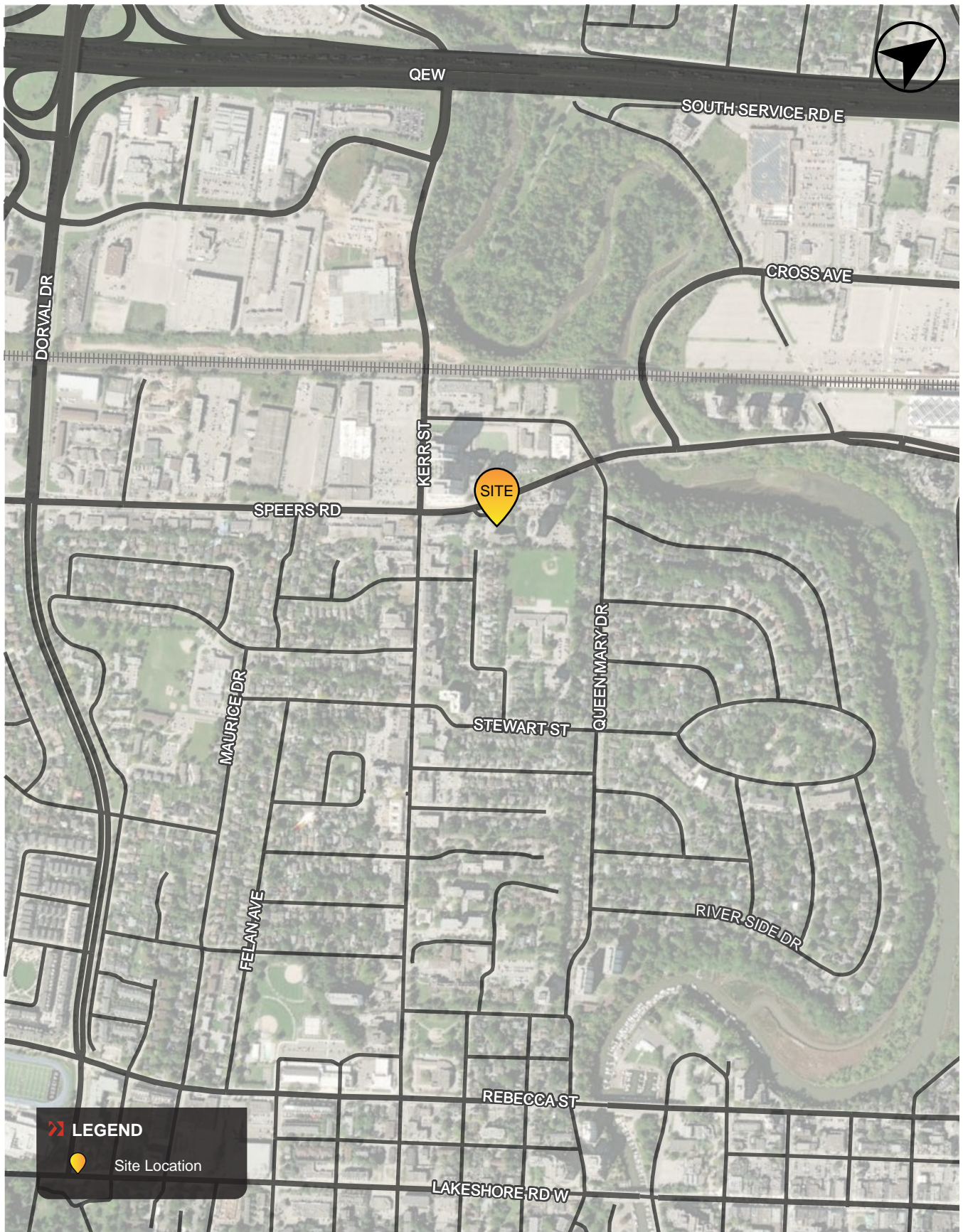


FIGURE 1 SITE LOCATION

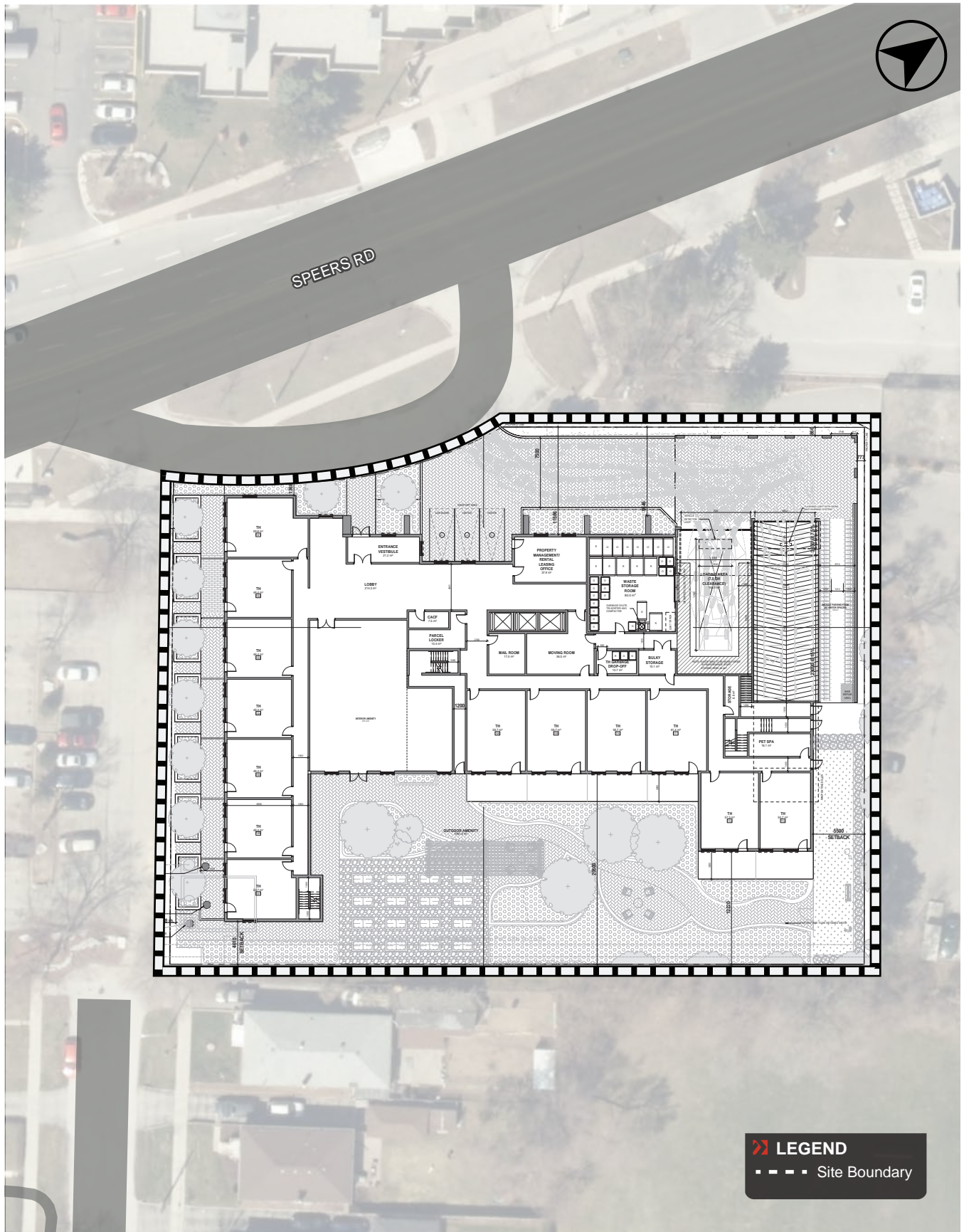


FIGURE 2 DEVELOPMENT PROPOSAL

1.3 STUDY SCOPE

The study scope is outlined below.

Transportation Context

- A description of the existing transportation context with consideration for the area road network, transit system and active transportation facilities.
- A description of any future transportation changes and/or improvements to the area context such as transit improvements and other non-automobile dependent travel options.

Development Proposal

- A summary of the proposed development.
- An overview of the site and the area-wide transportation system that facilitates a shift towards non-automobile travel for prospective residents and visitors, while still being able to meet the practical and operational needs of the proposed development plan.
- A review of the transportation elements of the proposed development plan that includes vehicle access and circulation, loading and parking facilities.

Transportation Demand Management Framework

- An overview of potential Transportation Demand Management (TDM) measures and initiatives that are being considered to encourage prospective residents and visitors to use more active and sustainable modes of transportation.

Site Plan

- A review of the adequacy of the vehicle and bicycle parking supply.
- A review of the adequacy of the loading space provisions.
- A review of the functionality and appropriateness of the proposed vehicle, pedestrian and cycling facilities incorporated into the site plan, including loading/garbage collection facility arrangements.

Travel Demand Forecasting

- An assessment of the existing travel patterns and traffic volumes in the study area, during the key weekday morning and afternoon peak hours.
- A comprehensive review of future growth that may occur in the area, including corridor growth and consideration for a number of other area development projects.
- An assessment of the multi-modal trip generation potential of the proposed development.

Traffic Operations Review

- A review of traffic operations at intersections in the area, under existing and future conditions, including an assessment of the operational impacts of the proposed development.
- An assessment of any mitigative measures to accommodate the development traffic.

The findings of this review are summarized in the following sections.



2.0 POLICY & PLANNING CONTEXT

The **Provincial Policy Statement** (PPS 2020) is issued under the authority of Section 3 of the Planning Act. It provides direction on matters of provincial interest related to land use planning and development, and promotes the provincial “policy-led” planning system.

With respect to transportation systems, Part V of the PPS, through the Policies in Section 1.6.7, promote maintaining and improving connectivity within and among transportation systems and modes (1.6.7.3) as well as a land use pattern, density and mix of uses that minimize the length and number of vehicle trips and support the development of viable choices and plans for public transit and other alternative transportation modes, including commuter rail and bus (1.6.7.4).

In addition, the PPS in Policy 1.6.8.3 indicates that planning authorities shall not permit development in planned corridors that could preclude or negatively affect the use of the corridor for the purpose(s) for which it was identified.

The **Growth Plan for the Greater Golden Horseshoe** (2019) provides a framework for implementing the Government of Ontario’s vision for building stronger, prosperous communities within the Greater Golden Horseshoe by better managing growth.

The Plan directs growth within the Greater Golden Horseshoe area to the existing urban areas in order to make better use of land and infrastructure. Concentrating intensification in these areas provides a focus for a transit and infrastructure investment to support growth.

The Growth Plan supports a transportation system that exhibits connectivity amongst modes, a balance of modal choices for users of the system ensuring walking, cycling and transit are promoted, sustainability (i.e., economical and environmentally appropriate), multi-modal choices for all trip types to satisfy their travel needs, and is safe. Furthermore, the Growth Plan directs Transportation Demand Management (TDM) policies to be adopted by municipalities towards reducing trip distance and time and increasing modal share to alternatives to the automobile.

The location of the proposed development demonstrates the characteristics of an area within a Major Transit Station Area (MTSA). The Growth Plan for the Greater Golden Horseshoe (2020) defines the Major Transit Station Areas (MTSAs) that are within a 500 to 800-metre radius of a transit station (i.e. a 10-minute walking distance). The proposed development is 750 metres (approximately a 10-minute walk) away from the Oakville GO Station (a higher order transit station). As shown in **Figure 3**, the site is just inside the 800-metre radius of a major transit station and is a reasonable walking distance of the Oakville GO Station.

The policies of the Growth Plan support transportation systems as follows:

- Connectivity amongst travel modes;
- Provide travel mode choices for all trip types and promotes walking, cycling and transit;
- Promotes sustainability (i.e. travel that is economical and environmentally appropriate);
- Consideration for safety related to all travel modes;
- Adopt Transportation Demand Management (TDM) strategies to reduce trip distances & travel time and shift travel mode shares away from single occupant automobile trips;



- Highlight the importance of planning for the integration of active transportation within the existing and planned street network and within development projects;
- Prioritize intensification and higher densities in strategic growth areas to support the efficient use of land, infrastructure and transit viability;
- Consider the provision of higher density housing that provides access to transit and other amenities.

2.1 RELEVANT POLICIES OF THE TOWN OF OAKVILLE OFFICIAL PLAN – LIVABLE OAKVILLE

2.1.1 Livable Oakville – Growth Areas – Kerr Village

The Upper Kerr Village District is envisioned as a higher density, transit-supportive, mixed use area. This district will include gateway features, urban park with pedestrian midblock connections and establish a mix of commercial and residential uses. Within Livable Oakville, Part E – Growth Areas, Kerr Village, there are a number of relevant policies that support the intensification of the Upper Kerr Village and directly consider the mobility needs and requirements, supporting land use policies (internalization of trip making), and phasing necessary to fulfill those goals and objectives and that have been incorporated into the Draft OPA document.

Policy 23.2.2 states that:

Objectives

Enhance the mobility of all users with the provision of transit priority measures and increase levels of service through the development process by:

- a) promoting pedestrian and cycling-oriented mixed use development, with improved connections to the Downtown as well as the GO train station and proposed employment hub in Midtown Oakville;*
- b) improving circulation, connections and access for cyclists, pedestrians and public transit; and,*
- c) increasing efficiencies for alternate modes of transportation by encouraging compact urban form.*

Policy 23.3.1 states in part that:

Development Concept

Upper Kerr Village District

The Upper Kerr Village District will become a transit-supportive and mixed use area. Higher density forms of development are permitted to achieve the critical mass required for enhanced transit.



Policy 23.4.1 states that:

Functional Policies

Transportation

a) The Town will introduce transit service improvements at an early stage in the development of Upper Kerr Village District. As the revitalization of this district evolves it will be serviced by the extension of improved transit levels of service, including transit priority measures and infrastructure required to create an efficient and attractive transit environment.

b) Through the development process, attractive transit environments are encouraged to include transit passenger amenities, minimal surface parking, and other travel demand management strategies to encourage transit ridership.

d) Bicycle facilities are encouraged throughout Kerr Village with the appropriate signage and infrastructure such as bicycle racks and bicycle lockers.

e) The feasibility of creating a new or improved east-west pedestrian/cycling connection across Sixteen Mile Creek in the general area of the QEW/Speers Road shall be investigated by the Town.

f) The redevelopment of Upper Kerr Village District shall anticipate the westerly extension of Shepherd Road and the northerly extension of St. Augustine Drive, with regard for potential redevelopment of adjacent lands.

2.1.2 The Plan for Kerr Village (2009)

The *Plan for Kerr Village (2009)* provides a framework of land use designations and policy tools to guide the revitalization of the Kerr Village community.

Within *The Plan for Kerr Village (2009)* there are seven considerations relating to revitalization:

- Effectively using existing infrastructure such as roads, water and wastewater services;
- Providing a wide range of housing choices closer to amenities, increasing convenience and reducing travel time;
- Improving infrastructure such as sidewalks and streets;
- Supporting new public assets such as parks, open space, civic buildings, libraries and community centres, as well as programs and services;
- Protecting the environment;
- Promoting the demand for walking and cycling;
- Promoting the demand for transit by improving levels of transit service, reducing the use of the private automobile and relieving traffic and congestion; and,
- Accommodating growth in appropriate places and curbing sprawl.



2.1.3 Summary

Given that the site is proposed to provide new high density residential rental units within walking distance of the Oakville GO Station, it satisfies the objectives of the Growth Plan for a MTSA area. In addition to the aforementioned points, the proposed development is within the Kerr Village Growth area (illustrated in **Figure 4**) that will be revitalized as a vibrant business core and cultural area, and will create new opportunities for sustainable growth by supporting and promoting higher density developments in the area. The densification target of the Kerr Village Growth Plan aligns with the targets set in the Growth Plan.

The development proposal fulfills a number of transportation-related policy directions by proposing to redevelop in proximity of a major transit corridor, with intensification and density of housing that will permit and encourage the efficient use of land, infrastructure and transit viability. The proposed development also satisfies the criteria to reduce the reliance on single occupant vehicle trips by proposing a TDM Plan.





P:\8013\02 - 50 Speers Road\Graphics\Adobe\Ds\8013-02_Figures for Review_February 2024.indd

Aerial maps provided courtesy of Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, the GIS User Community and/or Google Earth/Maps.

FIGURE 3 MAJOR TRANSIT STATION AREAS (MTSA) NEAR OAKVILLE GO STATION

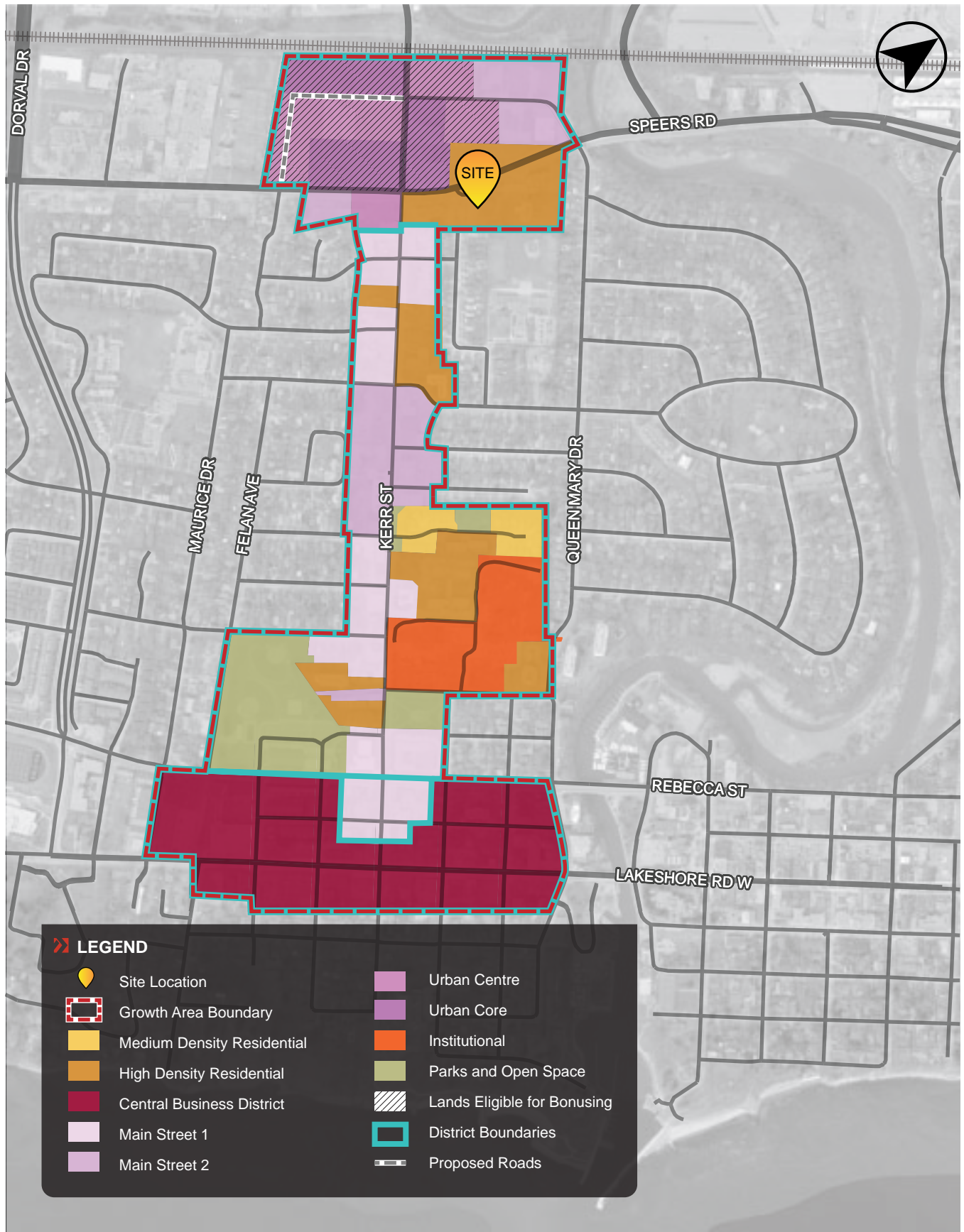


FIGURE 4 KERR VILLAGE GROWTH AREA

3.0 TRANSPORTATION CONTEXT

A number of transportation network improvements are planned or underway within the vicinity of the site, that will significantly alter the way area residents and visitors are able to travel. Most significantly, these improvements will facilitate a shift from predominantly automobile-based travel to more sustainable modes of travel, including transit, cycling and walking.

A summary of the key transportation network improvements that are planned or underway within the vicinity of the site includes the following:

- Lakeshore West Line (LW) GO Regional Express Rail (GO RER) high-order transit;
- Trafalgar Bus Rapid Transit (BRT); and
- Improved cycling connections outlined in the Town of Oakville Active Transportation Master Plan

The following sections provide a detailed discussion of the existing transportation context of the site and the above-noted network improvements.



3.1 AREA ROAD NETWORK

3.1.1 Existing Area Road Network

A description of the existing area road network is provided in **Table 2.**

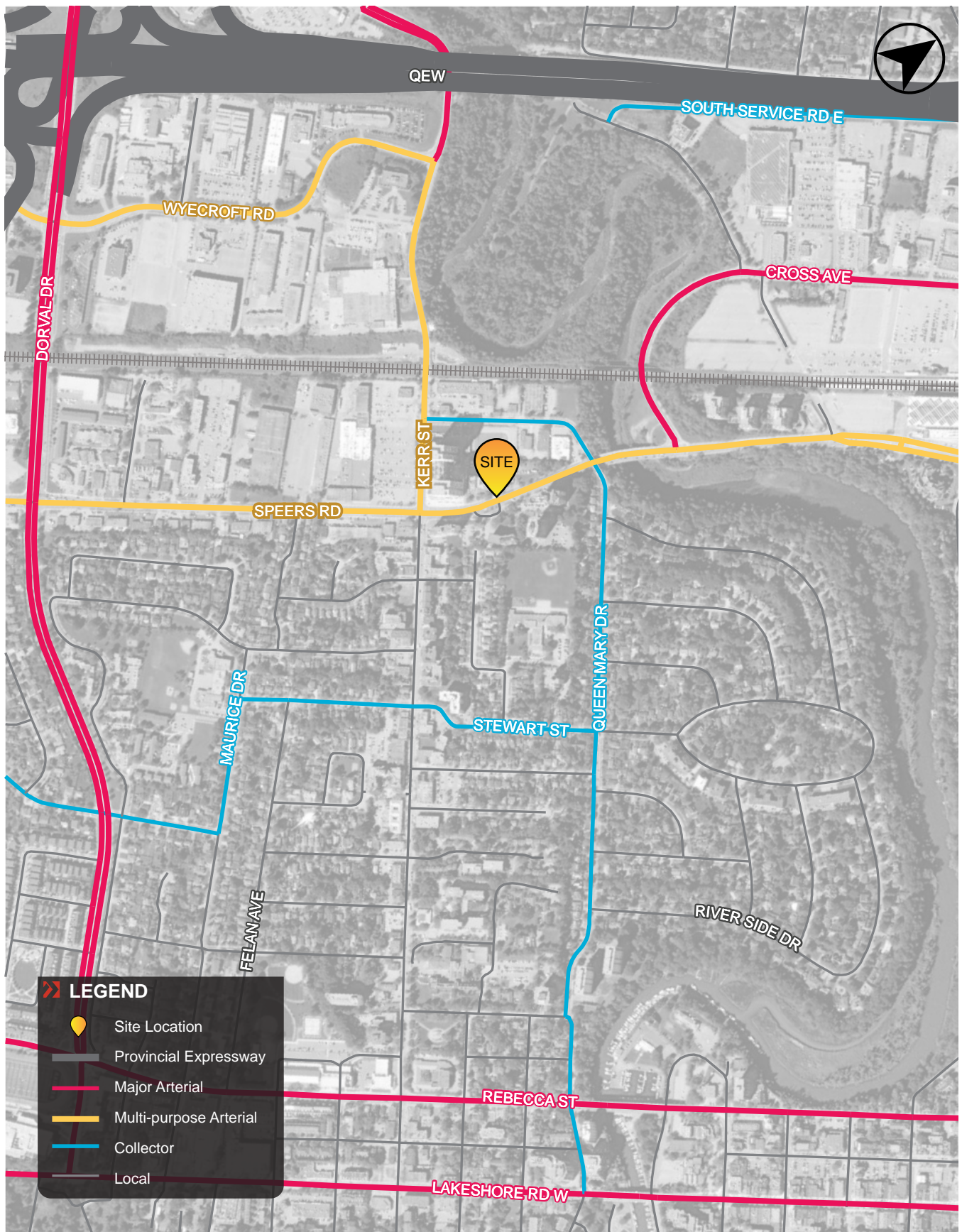
Both Speers Road and Kerr Street are Town of Oakville streets and are both considered Major Transportation Corridors according to the Livable Oakville Urban Structure. Both corridors provide strategic connections within the Town of Oakville, connecting to other key Town of Oakville Major Transportation corridors as well as Regional Roads.

The Queen Elizabeth Way (QEW)/Highway 403 is outside of the traffic analysis study area, but it is noted that the nearest Highway 403 ramp terminals, that provide both eastbound and westbound access to the highway, are less than 2 km from the site. The proximity of the QEW will provide convenient access for vehicles travelling to and from the site.

TABLE 2 EXISTING AREA ROAD NETWORK

Roadway	Description
Minor Arterials	
Speers Road	Speers Road is an east-west minor arterial road under the jurisdiction of the Town of Oakville. In the vicinity of the site, Speers Road has a 4-lane cross-section, with 2 lanes of travel in each direction and dedicated turning lanes at key intersections. The posted speed limit for this section of Speers Road is 60 km/h.
Kerr Street	Kerr Street is a north-south minor arterial road under the jurisdiction of the Town of Oakville. In the vicinity of the site, Kerr Street has a 4-lane cross-section, with 2 lanes of travel in each direction and dedicated turning lanes at key intersections. The posted speed limit for this section of Kerr Street is 50 km/h.
Collectors	
Queen Mary Drive	Queen Mary Drive is a north-south collector road under the jurisdiction of the Town of Oakville. Queen Mary Drive continues as Shepherd Road, north of Speers Road. In the vicinity of the site, Kerr Street has a 2-lane cross-section, with 1 lane of travel in each direction. The posted speed limit for this section of Queen Mary Drive is 50 km/h.
Steward Street	Steward Street is an east-west collector road under the jurisdiction of the Town of Oakville. In the vicinity of the site, Kerr Street has a 2-lane cross-section, with 1 lane of travel in each direction. The posted speed limit for this section of Steward Street is 50 km/h.
Local Roads	
Bartos Drive	Bartos Drive is a north-south local road under the jurisdiction of the Town of Oakville and extends from Stewart Street in the south. Bartos Drive consists of a 2-lane cross-section with 1 lane of travel in each direction. The posted speed limit is 40 km/h.
Prince Charles Drive	Prince Charles Drive is an east-west local road under the jurisdiction of the Town of Oakville and extends from St Augustine Drive in the west and Bartos Drive in the east. Prince Charles Drive consists of a 2-lane cross-section with 1 lane of travel in each direction. The posted speed limit is 50 km/h.

The existing area road network is illustrated in **Figure 5**. The existing area road lane configuration and traffic control are illustrated in **Figure 6**.



LEGEND







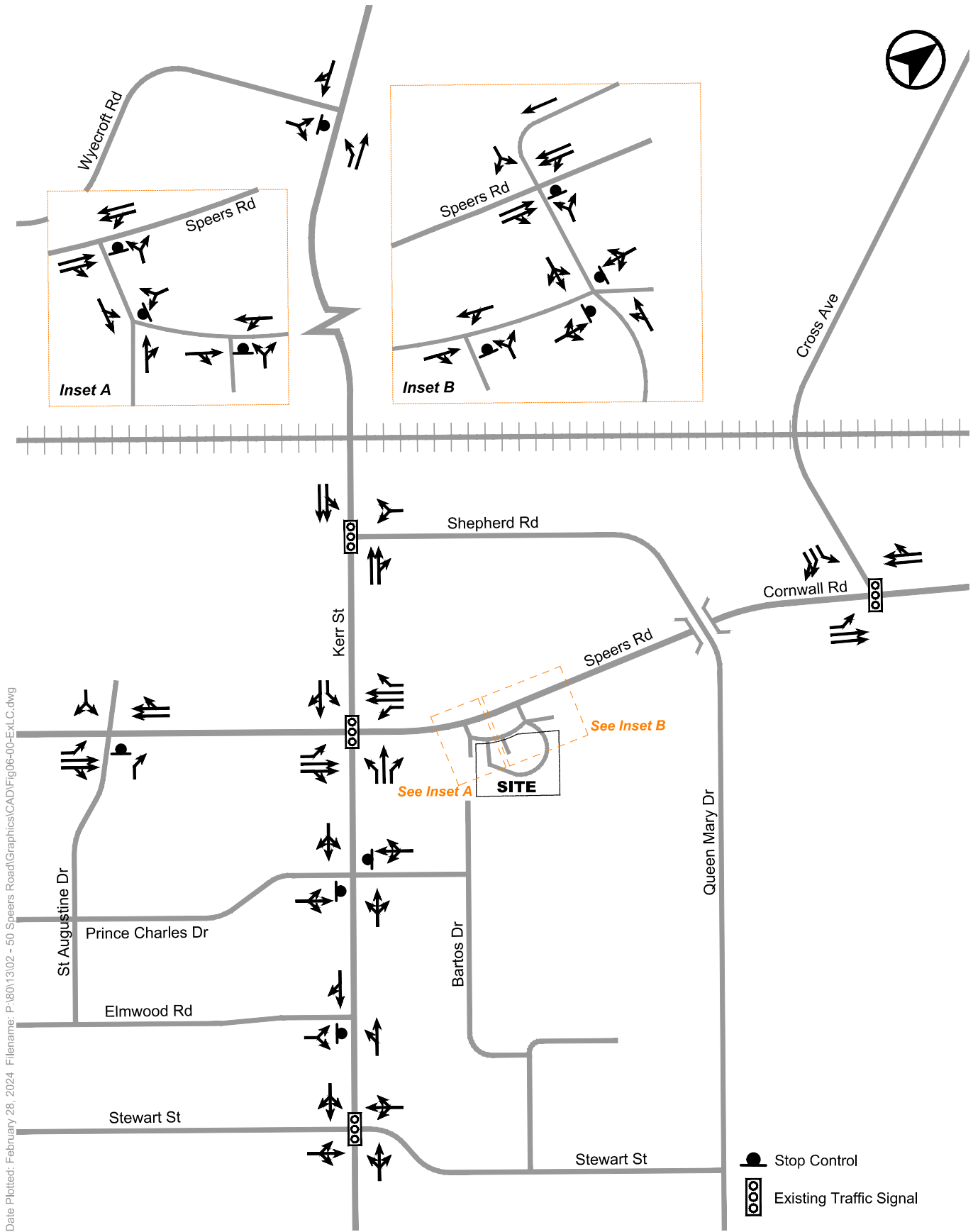
-  Site Location
-  Provincial Expressway
-  Major Arterial
-  Multi-purpose Arterial
-  Collector
-  Local

FIGURE 5 EXISTING AREA ROAD NETWORK



Date Plotted: February 28, 2024 Filename: P:\801\13102 - 50 Speers Road\Graphics\CAD\Fig06-00-ExLC.dwg

FIGURE 6 EXISTING AREA ROAD LANE CONFIGURATION AND TRAFFIC CONTROL

3.1.2 Planned Road Network Improvements

As part of the 2009 Kerr Village Transportation Assessment, the 2009 Speers Road Environmental Study Report and the Kerr Street Grade Separation Proposed Road Improvements, improvements in the immediate vicinity of the site area were identified for implementation in conjunction with development (intensification) and regional rail service upgrades within the Kerr Village Growth Area:

- Speers Road was identified as requiring an eastbound right-turn lane, in addition to the current lane configurations;
- Speers Road was identified as requiring bicycle lanes long its length to east of Kerr Street;
- Kerr Street was identified with dual southbound left-turn lanes at Speers Road and a dedicated southbound through lane and a dedicated southbound right-turn lane; and
- Given the potential future grade separation planned for Kerr Street, Kerr will have two through lanes in each direction plus left and right-turn lanes at Shepherd Road.

As the timing for the future Kerr Street underpass at the railway project has a deferred timeline, for the purpose of this study, it was assumed that grade separation would occur beyond the study horizon year.

Speers Road is also identified:

- As a Priority Transit Corridor (Mobility Management Strategy – Halton Region);
- With Transit in semi-exclusive/exclusive right-of-way (Transportation Master Plan – Halton Region); and
- As a Multi-purpose Arterial (Liveable Oakville).

It is important to note that the development of the site will have no impact on the existing Service Road along the north boundary of the site that connects to Speers Road. As such, the development of the site will have no impact on the Town's future ability to widen Speers Boulevard.

These improvements and designations were identified within the context of the planned intensification associated with the overall Kerr Village Growth Area. The future area road lane configuration and traffic control is illustrated in **Figure 7**.



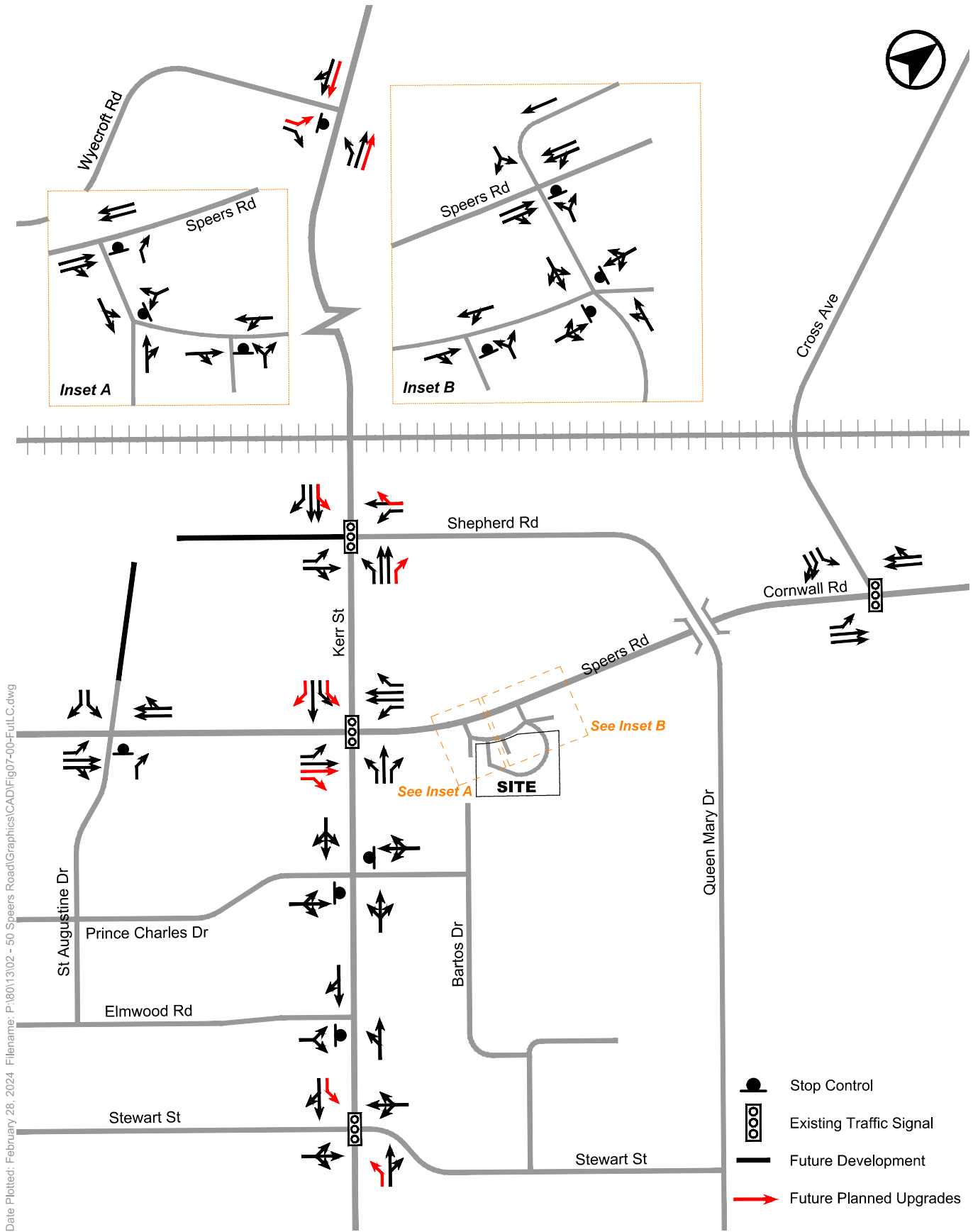


FIGURE 7 FUTURE AREA ROAD LANE CONFIGURATION AND TRAFFIC CONTROL

3.2 AREA TRANSIT NETWORK

3.2.1 Existing Transit Network

The site is currently served by local surface bus routes operated by Oakville Transit. Specifically, the site is currently serviced by 5 regular bus routes which collectively provide local connections to the higher-order GO Transit System. A detailed overview of the existing area transit network is summarized in **Table 3** and illustrated in **Figure 8**.

The site is in the enviable position of being at the convergence of 5 Oakville Transit routes that all lead to the Oakville GO Station. There are bus stops directly adjacent to the site on Speers Road (just west of the site and directly across the street on the north side of the road).

For transit trips facilitating commuting to the Oakville GO station, the combined headways of all 5 routes produce effective headways that result in only minutes between routes arriving at the Speers and Kerr intersection. Commuting connections to GO Transit Rail and bus service is centralized at the Oakville GO Station in Mid-town (only 750 metres to the east) for convenient transfers. For transit trips destined to other areas of the Town, the Speers and Kerr junction is an extremely convenient focal point that offers residents, guests/visitors, retail patrons and employees a high degree of accessibility.

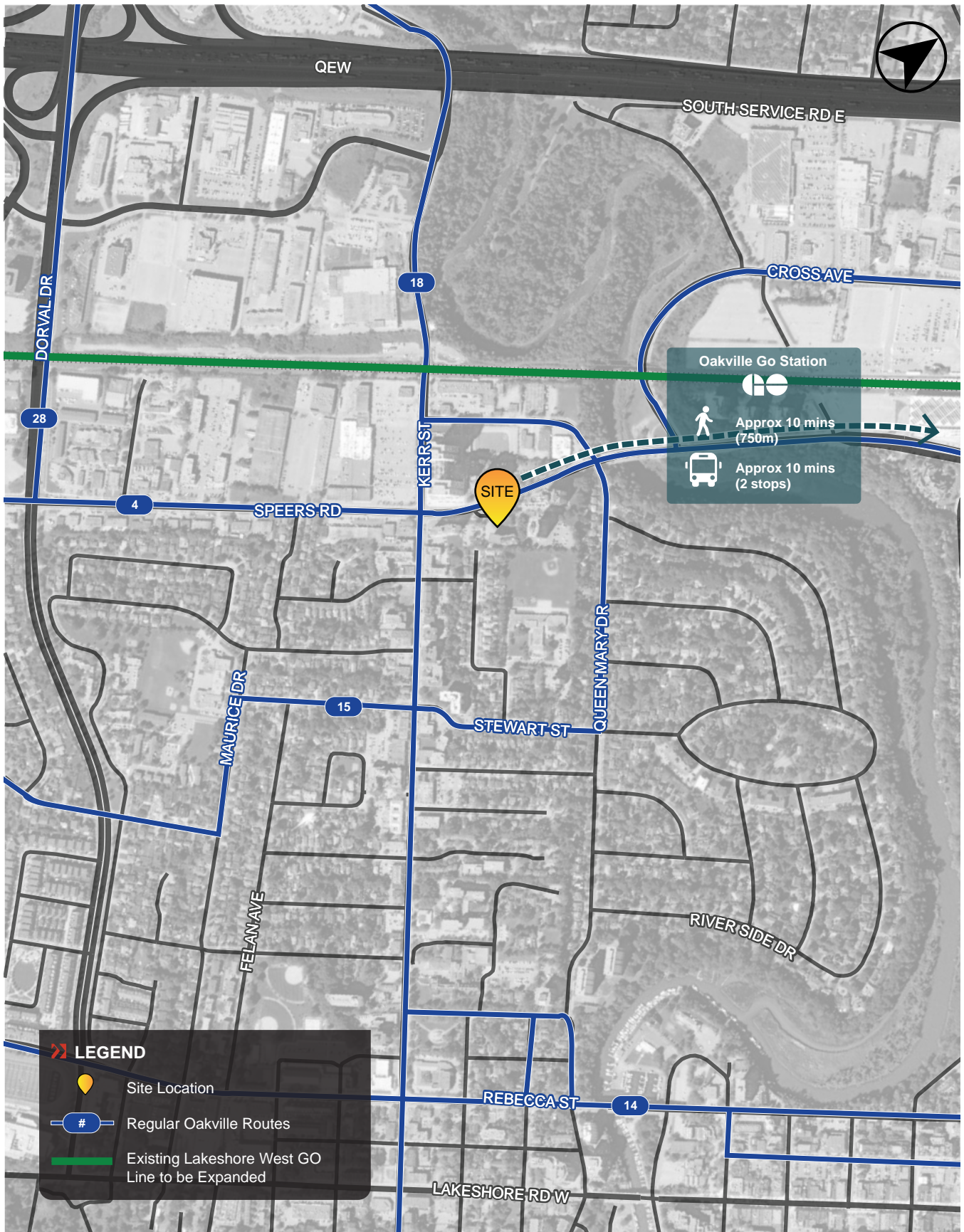
In addition to the regular transit service offered by Oakville Transit, an Accessibility Service referred to as Care-A-Van is provided that offers door-to-door service for anyone unable to use conventional transit service. This service has flexible hours and is offered 7 days a week.



TABLE 3 EXISTING AREA TRANSIT NETWORK

Route	Headway (peak periods)	Closest Stop Location	Description
4 Speers - Cornwall	Approx. 30 min.	Speers Road / Kerr Street (adjacent to site)	The 4 Speers - Cornwall bus route generally operates in an east-west direction along Cornwall Road between Bronte GO Station and Clarkson GO Station. Key stops include: Bronte GO, Oakville GO and Clarkson GO (Lakeshore West GO Line).
14 & 14A Lakeshore West	Approx. 15 min.	Speers Road / Kerr Street (adjacent to site)	The 14 & 14A Lakeshore West bus route generally operates in an east-west direction, between Appleby GO Station and Oakville GO Station. The 14 Lakeshore West bus runs along Great Lakes Boulevard while the 14A bus runs along Burloak Drive. Key stops include: Oakville GO (Lakeshore West GO Line), South Oakville Centre, RioCan Centre, Appleby GO (Lakeshore West GO Line).
15 Bridge	Approx. 30 min.	Speers Road / Kerr Street (adjacent to site)	The 15 Bridge bus route generally operates in an east-west direction between South Oakville Centre, Bronte Road and Rebecca Street, and Oakville GO Station. Key stops include: Oakville GO (Lakeshore West GO Line), and South Oakville Centre.
18 Glen Abbey South	Approx. 30 min.	Speers Road / Kerr Street (adjacent to site)	The 18 Glen Abbey South generally operates in an east-west direction, between Bronte GO Station and Oakville GO Station, along Abbeywood Drive, Pilgrims Way and Kerr Street. Key stops include: Bronte GO and Oakville GO (Lakeshore West GO Line)
28 Glen Abbey North	Approx. 30 min.	Speers Road / Kerr Street (adjacent to site)	The 28 Glen Abbey North generally operates in an east-west direction, between Bronte GO Station and Oakville GO Station, along Glenn Abbey Gate and Dorval Drive. Key stops include: Bronte GO and Oakville GO (Lakeshore West GO Line)
Oakville GO	-	Trafalgar Road / Cornwall Road (750 m or 10 mins walk)	The site is in the enviable position of being at the convergence of 5 Oakville Transit routes that all lead to the Oakville GO Station. Commuting connections to GO Transit Rail and bus service is centralized at the Oakville GO Station in Mid-town for convenient transfers. Key Routes include: Lakeshore West GO Line





P:\8013\02 - 50 Speers Road\Graphics\Adobe\Ds\8013-02_Figures for Review_February 2024.indd

Aerial maps provided courtesy of Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, the GIS User Community and/or Google Earth/Maps.

FIGURE 8 EXISTING AND FUTURE AREA TRANSIT NETWORK

3.2.2 Planned Transit Network Improvements

Lakeshore West GO Line Service Expansion

The Lakeshore West line is an existing GO Rail line that currently provides two-way, all-day service 7 days a week between Toronto and Aldershot. It also provides weekday rush-hour service from Hamilton to Toronto in the morning and back in the afternoon. Metrolinx has proposed expanded service characteristics to include 15-minute service or better frequencies, both-ways, throughout the day between Toronto and Aldershot, in addition to a 7-day a week, hourly service between Toronto and Hamilton. Oakville Transit will look to expand the hours of service and increase frequency of service to facilitate efficient and reliable connectivity with the rail line.

Trafalgar Road Rapid Transit – BRT

In both Halton Region's and Metrolinx's Transportation Master Plans, Trafalgar Road has been identified as a rapid transit corridor to feature an exclusive BRT service between Midtown Oakville and Highway 407. The idea behind BRT is to provide a dedicated lane for buses, allowing for faster, more reliable and more frequent transit service. The Trafalgar Road BRT will form a critical link for businesses and residents along the Trafalgar corridor. The systems also includes a major connection at the existing Uptown Oakville transit hub, and will provide connections with the future Dundas Street BRT, as well as the future Highway 407 Transitway, and improved GO Rail services.

In a December 2021 Planning and Development meeting, Oakville's Town Council included the Trafalgar Road BRT in its top seven priority projects indicating that the Town of Oakville is working closely with Metrolinx to support this initiative, and will continue to request Halton Region install High Occupancy Vehicle (HOV) lanes on the route until the BRT is built.

Dundas Street Rapid Transit – BRT

Dundas Street is a major east-west corridor in the GHTA, linking Toronto, Mississauga, and Halton Region. A 48 kilometre exclusive BRT service has been proposed on Dundas Street from Highway 6 in the City of Hamilton to Kipling Transit Hub in Toronto. Rapid transit connections will be provided at the Bloor-Danforth Subway in Toronto, the Milton GO Rail line, and the proposed Hurontario LRT in Brampton/Mississauga. Within the Town of Oakville, access to the Dundas Street BRT will be provided along various stops within the Town, as well as a major connection at the Uptown Oakville Transit Hub (Trafalgar Road / Dundas Street – Upper Middle Road intersection).

Oakville Mobility Hub

With the Big Move, Metrolinx established goals to implement Transit Mobility Hubs throughout the GHTA. Metrolinx defines a mobility hub as a place with significant amounts/connections to existing and/or planned transit. Through the Big Move, Midtown Oakville was identified as a major mobility hub which will act as a node for many incoming transit projects.



3.3 AREA CYCLING NETWORK

3.3.1 Existing Cycling Network

In the vicinity of the site there are presently no existing dedicated cycling facilities along either Speers Road or Kerr Street. The nearest cycling infrastructure are cycling lanes along Rebecca Street and Lakeshore Road West, approximately 1.2 kilometers south of the site, multi-use trails on Dorval Drive, approximately 800 metres west of the site, and multi-use trails within Sixteen Mile Creek park, approximately 350 metres east of the site.

These cycling connections provide opportunities for residents and visitors of the site and surrounding area to travel using active forms of transportation.

The existing and future area cycling network is illustrated in **Figure 9**.

3.3.2 Future Area Cycling Network Improvements

In the vicinity of the site, there a number of planned connections and improvements have been identified by the Town of Oakville and have been addressed through the *Oakville Active Transportation Master Plan (ATMP)* (2009), a policy document that outlines proposed cycling infrastructure improvements in Oakville over a twenty-year period implemented in two phases.

A number of cycling infrastructure improvements are planned within the vicinity of the site. On-road cycling lanes are proposed along Speers Road (west of Cross Avenue), Kerr Street (north of Speers Road), Queen Mary Drive and Cross Avenue. On-road signed cycling routes are proposed on Kerr Street (south of Speers Road), Stewart Street, Maurice Drive and Speers Road (east of Cross Avenue). Multi-use trails on Dorval Drive are to be extended. In addition, a potential future grade-separated crossing is proposed at the intersection of Speers Road and Kerr Street.

The existing and future area cycling network is illustrated in **Figure 9**.





P:\80113\02 - 50 Speers Road\Graphics\Adobe\Ds\8013-02_Figures for Review_February 2024.indd

Aerial maps provided courtesy of: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, the GIS User Community and/or Google Earth/Maps.

FIGURE 9 EXISTING AND FUTURE AREA CYCLING NETWORK

3.4 AREA PEDESTRIAN CONTEXT

The site is located in midtown Oakville and is situated northeast of the intersection of Speers Road and Kerr Street, which affords access to a number of commercial and employment uses within a reasonable walking distance.

At key locations near the site, there are many opportunities for pedestrians to cross at traffic signals and travel within the wider transportation network. All public streets in the site vicinity (including Speers Road, Kerr Street, Bartos Drive, Shepherd Road, and Prince Charles Drive) have continuous sidewalks on both sides of the roadway.

Pedestrian connectivity between the site and Oakwood Public School will be provided through the property adjacent to the site (80 Speers Road) and the existing connection to the sidewalk along Bartos Drive. A new walkway on the site will provide connectivity to the existing sidewalk on the east side of Bartos Drive.

Pedestrians can cross Speers Road at the existing pedestrian signal at Kerr Street (approximately 100 metres from the site). Pedestrian crosswalks are provided at all signalized intersections in the site vicinity, as well as at all-way stop controlled intersections.

The site is also located 400 metres (approximately a 6-minute walk) from Sixteen Mile Creek Park providing access to an off-road trail system. In addition, a future grade-separated crossing is proposed at the intersection of Speers Road and Kerr Street.

Figure 10 illustrates the area pedestrian context.



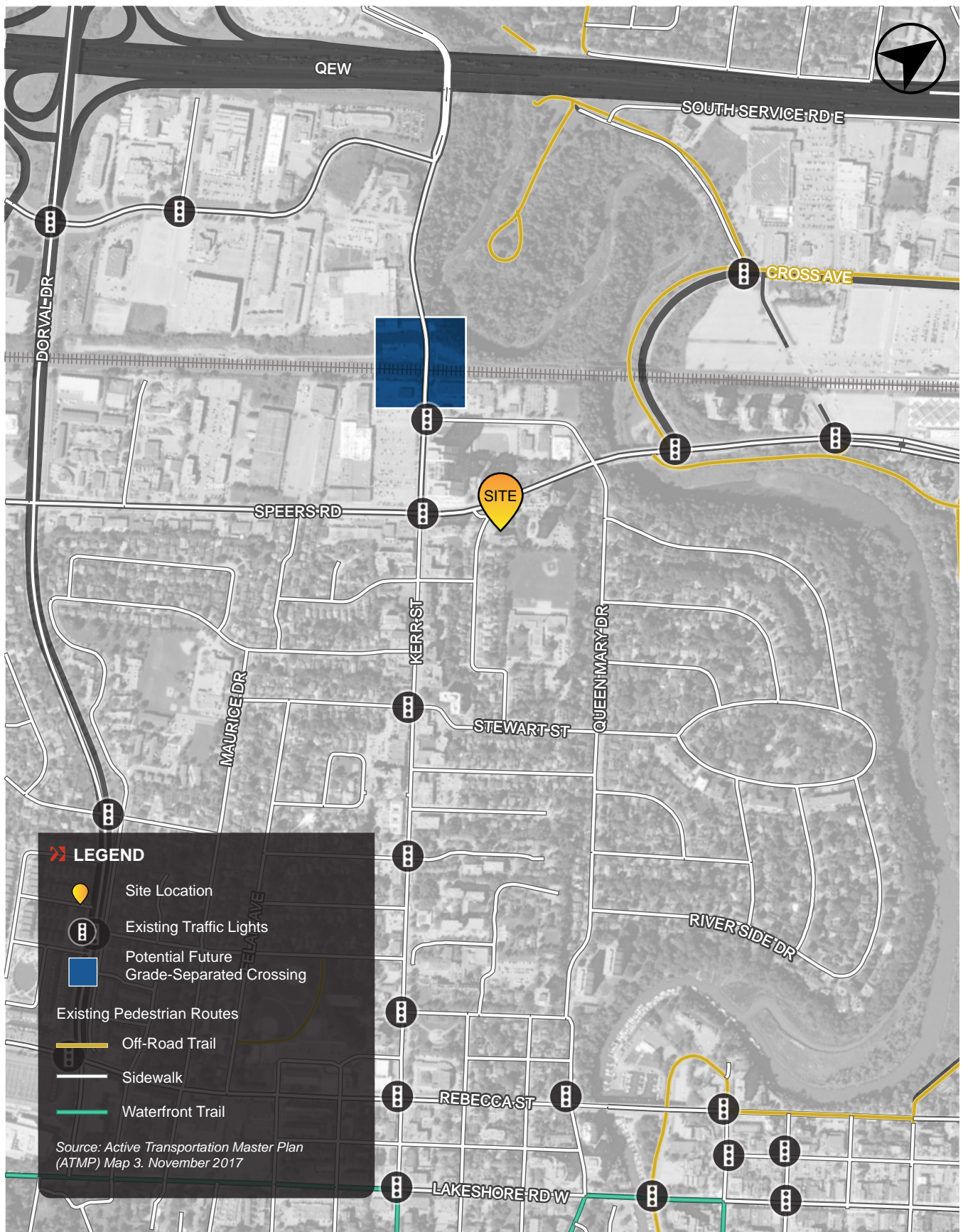


FIGURE 10 EXISTING & FUTURE AREA PEDESTRIAN NETWORK

4.0 VEHICLE PARKING CONSIDERATIONS

4.1 UPDATES SINCE PREVIOUS SUBMISSION

Since the first submission, changes to the proposed parking supply have been made. The primary change to the proposed parking strategy is that separate parking rates are proposed for resident parking and dedicated visitor parking. The updated application of the Town’s Zoning By-law 2014-014 requires a minimum of 270 resident parking spaces (0.82 spaces/unit) and a minimum resident visitor supply of 82 spaces (0.25 spaces/unit). The proposed resident parking supply of 280 spaces (0.85 spaces/unit) exceeds the minimum Zoning By-law requirements by 10 spaces. The proposed resident visitor parking supply of 50 spaces (0.15 spaces/unit) is 32 spaces less than required by the Zoning By-law. The following sections provide further details regarding the parking strategy and justification for the proposed resident visitor parking reduction.

4.2 ZONING BY-LAW REQUIREMENTS

The prevailing Zoning By-law for the site for parking supply requirements is the Town of Oakville’s Zoning By-law 2014-014. As shown in **Table 4**, the application of Zoning By-law 2014-014 parking standards to the site results in a total parking requirement of 352 spaces, inclusive of 270 resident spaces and 82 visitor spaces. This results in a total parking supply ratio for the site of 1.07 spaces per unit, with an effective resident rate of 0.82 spaces per unit.

TABLE 4 ZONING BY-LAW 2014-014 - MINIMUM PARKING REQUIREMENTS

Apartment Building	Description	Number of Units	Zoning By-law Minimum Parking Rate (spaces/unit)	Minimum Spaces Required
Residential units with NFA <75 m ²	Resident	285	0.75 ²	214
	Resident Visitor		0.25	71
Sub-total			1.0	285
Residential units with NFA ≥75 m ²	Resident	45	1.25 ³	56
	Resident Visitor		0.25	11
	Sub-Total			1.5
Total Resident		330	0.82	270
Total Resident Visitor			0.25	82
SITE TOTAL		330	1.07	352

Notes:

1. Site statistics based on site plans prepared by BDP Quadrangle Architects dated February 2024.
2. Assumed that as Zoning 2014-014 requires a total of 1.0 spaces/unit that 0.75 is assigned to residents and 0.25 is assigned to visitors.
3. As per Zoning By-law 2014-014 (Table 5.2.1) “Of the total number of parking spaces required (1.5 spaces/unit), 0.25 of the parking spaces required per dwelling shall be designated as visitor parking”.
4. As per Zoning By-law 2014-014 (Section 5.1.5), should the calculation of the number of parking spaces required end in a fraction, the “the minimum number of spaces shall be increased to the next highest whole number if the fraction is greater than 0.25.”
5. For the purpose of the parking calculations, NFA = GFA.



4.3 PROPOSED PARKING SUPPLY

The proposed parking supply for the site is summarized in **Table 5** and is based on a resident rate of 0.85 spaces per unit and a resident visitor rate of 0.15 spaces per unit. The total proposed parking supply includes 330 spaces, inclusive of 280 resident spaces and 50 resident visitor spaces.

TABLE 5 PROPOSED PARKING SUPPLY

Description	Number of Units	Proposed Parking Rate (spaces/unit)	Proposed Number of Spaces
Resident	330	0.85	280 ²
Resident Visitor		0.15	50
Site Total		1.0	330

Notes:

1. Site statistics based on site plans prepared by BDP Quadrangle Architects dated February 2024.
2. Resident parking supply includes 1 car share space at-grade.

4.4 ADEQUACY OF PROPOSED VISITOR PARKING SUPPLY

Resident visitor parking standards outlined in Zoning By-law 2014-014 could be considered to overstate the parking needs of a residential building in an area well served by transit. There is a broad range of parking supply and demand associated with residential buildings across the town of Oakville. Generally, parking demands have been declining over recent years in response to the changing demographics and economic factors. The availability of existing and future travel alternatives available within the vicinity of the site, reduces the need for visitors of the site to use a car on a day-to-day basis.

The following provides an overview of the contextual factors that influence resident visitor parking demand at residential buildings in the site area:

- Transportation planning principles;
- Existing and evolving transportation context;
- Recent reduced visitor parking supply ratio approvals;
- Proxy sites observed visitor parking demands; and
- Proposed TDM measures for the site.

4.4.1 Transportation Planning Principles

A reduction in resident visitor parking is consistent with the Town of Oakville's *Livable Oakville Plan* policies which support focused urban growth connected by public transportation systems and reduced auto dependency. A reduced parking supply is also consistent with the Provincial Growth Plan, *A Place to Grow: Growth Plan for the Greater Golden Horseshoe*, and the *Provincial Policy Statement* ("PPS"), which prioritize developments that promote active transportation and in areas with strong connections to transit.



Providing a parking supply well beyond the needs of a building encourages auto trips. In consideration of the broader overall transportation network, one of the most effective and direct ways to induce changes in travel behaviour and reduce automobile use, is to reduce the amount of vehicle parking provided, particularly in transit accessible and central areas of the town. While the consideration and implementation of various TDM initiatives has been proposed as a part of the development plan (detailed in **Section 7.0**), these are more effectively implemented in tandem with an appropriate vehicle parking supply. Providing a limited amount of parking is a direct incentive for visitors to use sustainable transportation.

4.4.2 Existing and Evolving Transportation Context

The location of the site will afford future residents and visitors with numerous options for transportation that will eliminate the need to park on-site. The complete transportation context is provided in **Section 3.0**.

The site is well-located relative to existing higher order and surface transit routes and is currently serviced by 5 regular bus routes which collectively provide local connections to the higher-order GO Transit System. The nearest bus stops to the site are currently located directly adjacent to the site on the south side of Speers Road and directly across from the site on the north side of Speers Road. The site is also located within approximately 750 metres of Oakville GO Station.

The site's position relative to the above-noted sustainable transportation infrastructure is highly supportive of the adoption of resident visitor parking standards that are lower than the prevailing Zoning by-law requirements. Future upgrades in the surrounding transportation network are also supportive of a reduced resident visitor parking standard, including the Lakeshore West GO RER and Trafalgar BRT. The Lakeshore West GO Line service expansion will provide 15-minute service or better frequencies, both ways throughout the day. Oakville GO Station is approximately 750 metres from the site and Oakville Transit is looking to expand its frequency of service to facilitate efficient and reliable connectivity to the rail line. The Trafalgar bus rapid transit (BRT) will form a critical link for residences along the Trafalgar corridor, allowing for faster and more frequent transit service. The site is approximately 1.0 kilometer west from Trafalgar Road.

4.4.3 Approved Reduced Resident Visitor Parking Rates

It is proposed to provide a resident visitor parking rate of 0.15 spaces per unit. It is noted that visitor parking standards in areas with high levels of transit accessibility, such as the site, have been approved at rates below the Zoning By-law 2014 standards, setting a new precedent. Such approvals have been secured through municipal councils, the former Ontario Municipal Board, the Local Planning Appeal Tribunal (LPAT), and the Committee of Adjustment (CoA).

A selection of examples of such condominium buildings where reduced overall visitor parking supplies have been approved by the municipality, or other processes, in other transit accessible areas, is provided in **Table 6** and **Table 7**. The examples are from residential condominiums in Oakville and developments with a similar transportation context as the site.



TABLE 6 AREA APPROVED REDUCED VISITOR PARKING SUPPLY RATIOS

Address	Major Intersection	Visitor Parking Ratio Applied	Permission Through
70 Old Mill Road (Block 2)	Cornwall Road / Trafalgar Road	0.15 spaces per unit	Site-Specific By-law 2022-047
2264, 2274 and 2320 Trafalgar Road (Town's Former Public Works Site)	Oak Park Boulevard / Trafalgar Road	0.15 spaces per unit	Site-Specific By-law 2021-021
194-266 Lakeshore Road	Lakeshore Road East / Trafalgar Road	0.19 spaces per unit	Site Specific By-law 0281-2015 Town By-law Exception C4-59
1005 Dundas St / 3033 Eighth Line	Dundas Street East / Eighth Line	0.12 spaces per unit	CoA Decision CAV.147/2021

TABLE 7 APPROVED REDUCED VISITOR PARKING SUPPLY RATIOS WITH SIMILAR TRANSIT CONNECTIONS

Address	Nearest Transit Station (Distance)	Visitor Parking Ratio Applied	Permission Through
81 Robinson Street	Hamilton GO Centre Station (600m / 7min walk)	0.13 spaces per unit	City of Hamilton Site-Specific By-law 14-118
5365 Dundas Street West (Phase 2 & Phase 3)	Kipling GO Station (600m / 7min walk)	0.10 spaces per unit ¹	City of Toronto Site Specific By-law 1268-2018
24-64 Elm Drive	Cooksville GO Station (1.4km / 18min walk)	0.15 spaces per unit	City of Mississauga Site-Specific By-law 0154-2016 City By-law Exception RA5-46
3560, 3580, 3600 Lake Shore Boulevard West	Long Branch GO Station (1.2km / 16min walk)	0.15 spaces per unit	City of Toronto Site Specific By-law 1723-2013
3560 St. Clair Avenue East	Scarborough GO Station (750m / 9min walk)	0.15 spaces per unit	City of Toronto Site Specific By-law 1671-2013
2035 Kennedy Road	Agincourt GO Station (1.5km / 19min walk)	0.17 spaces per unit	City of Toronto Site Specific By-law 1092-2019(LPAT)

Notes:

1. Provided residential parking is inclusive of visitor parking.
2. Parking ratio was provided in LPAT approved plans dated June 11, 2019.

The approved visitor parking supply ratios outlined in **Table 6** and **Table 7** range from 0.10 spaces per unit to 0.19 spaces per unit.



4.4.4 Proxy Site Observed Visitor Parking Demand

In order to assess the visitor parking demand at other similar buildings in the area, BA Group conducted evening and overnight visitor parking surveys at several residential locations within the Town of Oakville.

Parking demand surveys were conducted at 2379 Central Park Drive, 216 Oak Park, White Oaks Apartments (1297 Marlborough Court & 1360 White Oaks Boulevard), and 1229 Marlborough Court, between October 9th, 2013, and October 28th, 2019 as a means to understand demand, given the evolving transit context and shift towards more urban conditions of the site.

TABLE 8 VISITOR PARKING DEMAND STUDIES - PROXIES

Address (Major Intersection)	Study Date	Peak Hour	Site Description	Visitor Parking	
				Demand (spaces)	Ratio (spaces / unit)
2379 Central Park Dr ¹ (Dundas St E / Sixth Line)	Tues, Nov. 27, 2018	6:00 a.m.	301 Units / 68 Visitor Parking Spaces	20	0.07
	Sat, Dec. 1, 2018	6:00 a.m.		31	0.10
	Sun, Dec. 2, 2018	6:00 a.m.		30	0.10
216 Oak Park ² (Trafalgar Rd / Glenashton Dr)	Tues, Nov. 27, 2018	5:30 p.m.	213 Units / 38 Visitor Parking Spaces	30	0.14
	Sat, Dec. 1, 2018	1:30 .m.		29	0.14
	Sun, Dec. 2, 2018	2:30 p.m.		29	0.14
1297 Marlborough Crt & 1360 White Oaks Blvd ³ (Trafalgar Rd / Upper Middle Rd E)	Fri, Oct. 25, 2019	3:00 a.m.	263 Units / 56 Visitor Parking Spaces	35	0.13
	Fri, Oct. 25, 2019	9:00 p.m.		42	0.16
	Sat, Oct. 26, 2019	3:00 a.m.		34	0.13
	Sat, Oct. 26, 2019	9:00 p.m.		33	0.13
	Mon, Oct. 28, 2019	9:00 p.m.		35	0.13
1229 Marlborough Crt ⁴ (Trafalgar Rd / Queen Elizabeth Way)	Wed, Oct. 9, 2013	3:00 a.m.	227 Units / 329 Parking Spaces	7	0.03
	Thurs, Oct. 10, 2013	3:00 a.m.		9	0.04

Notes:

1. The surveys were undertaken from 6:00 a.m. to 5:30 p.m. with 30 minute interval counts.
2. Visitor parking spaces surveyed were undertaken from 6:00 a.m. to 5:30 p.m. with 30 minute interval counts.
3. The surveys were undertaken from 2:00 p.m. to 9:00 p.m. with 30 minute interval counts, and 3:00 a.m. spot counts.
4. The surveys were undertaken at 3:00 a.m. (spot counts).

Table 8 outlines that the overall visitor parking demand at the proxy sites are in the range of 0.03 and 0.16 spaces per unit. A summary of the observed / recorded ranges outlined within this section are provided in **Table 9**.



4.5 PROPOSED PARKING STRATEGY

4.5.1 Summary of Proposed Parking Supply

The primary change to the proposed parking strategy is that separate parking rates are now proposed for resident parking and dedicated visitor parking.

The proposed parking supply for the site is summarized in **Table 11** and is based on a resident rate of 0.85 spaces per unit and a resident visitor rate of 0.15. The total proposed parking supply includes 330 spaces, inclusive of 280 resident spaces and 50 resident visitor spaces. The proposed resident parking supply (0.85 spaces/unit) exceeds the minimum requirements (0.82 spaces/unit) of Zoning By-law 2014-014 by 10 spaces while the proposed resident visitor parking supply of 50 spaces (0.15 spaces/unit) is 32 spaces less than required by the Zoning By-law.

The resident parking will be provided in the below-grade parking facility, with the exception of 1 resident carshare space to be provide at-grade. The resident visitor spaces will be provided below-grade on P1, with the exception of 2 resident visitor spaces that will be provided at-grade. The resident visitor parking on P1 will be physically separated from the secure resident parking.

TABLE 11 PROPOSED PARKING SUPPLY

Description	Number of Units	Proposed Parking Rate (spaces/unit)	Proposed Number of Spaces
Resident	330	0.85	280 ²
Resident Visitor		0.15	50
Site Total		1.0	330

Notes:

1. Site statistics based on site plans prepared by BDP Quadrangle Architects dated February 2024.
2. Resident parking supply includes 1 car share space at-grade.

The proposed parking supply is appropriate for the following reasons:

- The proposed resident parking supply slightly exceeds the minimum requirements of the Zoning By-law;
- The proposed resident visitor parking rate is slightly below the minimum requirements of the Zoning By-law well but is within the range of the observed / recorded for resident visitor parking reduction approvals;
- The availability of excellent transit service in the area, including the proximity of the Oakville GO Station (750 metres away from the site) and adjacent local bus routes, support the proposed parking rates for the site, through the provision of convenient and sustainable travel options;
- Recent reduced resident visitor parking supply ratio approvals for buildings in the surrounding area and with similar transit connections, suggest that the proposed resident visitor parking rate is reasonable;



- The site is well-situated close to various land uses that support shorter travel distances that are easily made by walking, cycling or transit, as opposed to the private automobile;
- Proposed Transportation Demand Management Plan for the site that includes the provision of a bicycle repair station and a bicycle parking supply that meets the Zoning By-law requirements and provision of on-site communication / information to generate awareness of sustainable modes of travel in the site vicinity; and
- Transportation planning principles.

The proposed parking supply will meet the practical requirements of the site and will promote the use of non-auto modes of travel.

4.5.2 Accessible Parking

The Town of Oakville Zoning By-law 2014-014 requires that accessible spaces be provided for non-resident visitor uses at a minimum rate of 4% of the total number of visitor parking spaces, for a visitor parking supply within the range of 26 to 100 spaces. Furthermore, the By-law states that where there are an even number of total accessible parking spaces, an equal number of Type 'A' and Type 'B' spaces must be provided. The two types of spaces must adhere to the following dimensions:

- Type A space: 5.7 metres (length) x 3.65 metres (width)
- Type B space: 5.7 metres (length) x 2.7 metres (width)

Both types must include a 1.5-metre pedestrian aisle adjacent to the accessible space. The proposed parking supply for the site includes 330 spaces, inclusive of 280 resident spaces and 50 resident visitor spaces. As summarized in **Table 12**, the Zoning By-law would require a minimum of 2 accessible parking spaces for non-residents.

TABLE 12 ZONING BY-LAW 2014-014: ACCESSIBLE PARKING REQUIREMENTS

Non-residential Parking Supply	Range	Minimum Rate	Minimum Requirement	Type Allocation
50 spaces	26 - 100 spaces	4% of total visitor parking supply	2 spaces	1 Type A 1 Type B

Notes:

1. Site statistics based on site plans prepared by BDP Quadrangle Architects dated February 2024.
2. Accessible parking rates as per Town of Oakville Zoning By-law 2014-014 Table 5.3.1 & Table 5.3.2

The development plans illustrate a total of 3 accessible parking spaces, inclusive of 2 accessible visitor spaces and 1 accessible resident space, which exceeds the minimum requirements. The proposed accessible parking supply complies with the Zoning By-law dimensional requirements. Furthermore, accessible parking spaces are proposed to be provided within the below-grade parking facilities and will be located in proximity to the elevator cores.

The proposed accessible parking supply meets the requirements of Zoning By-law 2014-014 requirements and will meet the practical needs of the site.



- The site is well-situated close to various land uses that support shorter travel distances that are easily made by walking, cycling or transit, as opposed to the private automobile;
- Proposed Transportation Demand Management Plan for the site that includes the provision of a bicycle repair station and a bicycle parking supply that meets the Zoning By-law requirements and provision of on-site communication / information to generate awareness of sustainable modes of travel in the site vicinity; and
- Transportation planning principles.

The proposed parking supply will meet the practical requirements of the site and will promote the use of non-auto modes of travel.

4.5.2 Accessible Parking

The Town of Oakville Zoning By-law 2014-014 requires that accessible spaces be provided for non-resident visitor uses at a minimum rate of 4% of the total number of visitor parking spaces, for a visitor parking supply within the range of 26 to 100 spaces. Furthermore, the By-law states that where there are an even number of total accessible parking spaces, an equal number of Type 'A' and Type 'B' spaces must be provided. The two types of spaces must adhere to the following dimensions:

- Type A space: 5.7 metres (length) x 3.65 metres (width)
- Type B space: 5.7 metres (length) x 2.7 metres (width)

Both types must include a 1.5-metre pedestrian aisle adjacent to the accessible space. The proposed parking supply for the site includes 330 spaces, inclusive of 280 resident spaces and 50 resident visitor spaces. As summarized in **Table 12**, the Zoning By-law would require a minimum of 2 accessible parking spaces for non-residents.

TABLE 12 ZONING BY-LAW 2014-014: ACCESSIBLE PARKING REQUIREMENTS

Non-residential Parking Supply	Range	Minimum Rate	Minimum Requirement	Type Allocation
50 spaces	26 - 100 spaces	4% of total visitor parking supply	2 spaces	1 Type A 1 Type B

Notes:

1. Site statistics based on site plans prepared by BDP Quadrangle Architects dated February 2024.
2. Accessible parking rates as per Town of Oakville Zoning By-law 2014-014 Table 5.3.1 & Table 5.3.2

The development plans illustrate a total of 3 accessible parking spaces, inclusive of 2 accessible visitor spaces and 1 accessible resident space, which exceeds the minimum requirements. The proposed accessible parking supply complies with the Zoning By-law dimensional requirements. Furthermore, accessible parking spaces are proposed to be provided within the below-grade parking facilities and will be located in proximity to the elevator cores.

The proposed accessible parking supply meets the requirements of Zoning By-law 2014-014 requirements and will meet the practical needs of the site.



5.0 BICYCLE PARKING CONSIDERATIONS

5.1 ZONING BY-LAW REQUIREMENTS

The site is subject to the minimum bicycle parking requirements of the Town of Oakville Zoning By-law 2014-014. Application of the minimum bicycle parking requirements based on this Zoning By-law is summarized in **Table 13**.

A total of 330 bicycle parking spaces are required, including 248 spaces located in secure, weather-protected areas for long-term use and 82 spaces located in convenient accessible locations for short-term use.

TABLE 13 ZONING BY-LAW 2014-014 - MINIMUM BICYCLE PARKING REQUIREMENTS

Use	Number of dwelling units	Minimum Parking Rate (spaces/unit)		Minimum # of Bicycle Parking Spaces Required	
		Resident	Visitor	Long-term	Short-term
Apartment Building	330	Resident	0.75	Long-term	248
		Visitor	0.25	Short-term	82
		Total	1.0	--	330

Notes:

1. Site statistics based on site plans prepared by BDP Quadrangle Architects dated February 2024.
2. As per Zoning By-law 2014-014 (Table 5.4.1) "Of the total number of bicycle parking spaces required (1.0 spaces/unit), 0.25 of the bicycle parking spaces required per dwelling shall be designated as visitors bicycle parking".
3. As per Zoning By-law 2014-014 (Section 5.1.5), should the calculation of the number of parking spaces required end in a fraction, the "the minimum number of spaces shall be increased to the next highest whole number if the fraction is greater than 0.25."

5.2 PROPOSED BICYCLE PARKING SUPPLY

The current architectural drawings for the includes 82 short-term spaces and 248 long-term spaces for a total of 330 spaces. The 82 short-term spaces will be provided in a publicly accessible location and the 248 long-term spaces will be provided in the below-grade parking facility. The proposed bicycle parking supply meets the requirements of Zoning By-law 2014-014.

The location of the bicycle parking areas is illustrated in the site plan included in **Appendix B**.



6.0 LOADING CONSIDERATIONS

6.1 ZONING BY-LAW REQUIREMENTS

The Town's Zoning By-law 2014-014, does not include a requirement for a minimum number of loading spaces.

The By-law (Section 5.6) does however require the following:

- The minimum dimensions of a loading space are: 3.5 m width, 12.0 m length and 4.2 m vertical clearance
- A loading space shall abut the building for which the loading space is provided
- A loading space shall be set back 7.5 m from any Residential Zone, except if entirely within a structure.

6.2 PROPOSED LOADING FACILITIES

The proposed loading facilities are located on the ground floor of the building and are accessed from the driveway on the west limits of the site. A total of 1 loading space is proposed for the Site to accommodate the servicing needs of the proposed residential development.

The proposed loading facilities have been designed to accommodate the in/out manoeuvring of the loading space for a Halton Region front loading refuse truck and a single unit (SU) truck (which will undertake both residential moving operations and deliveries to the proposed building). The proposed loading facilities incorporate adequate turnaround area to ensure that refuse collection vehicles can enter/exit the site in a forward motion. Vehicle Manoeuvring Diagrams illustrating the turning movement requirements of these vehicles entering and exiting the site, as well as manoeuvring in and out of the proposed loading space are included in **Appendix C**.

The loading facilities, turnaround area and access to the proposed loading facilities, are designed to accommodate a minimum unencumbered height clearance of 4.4 metres throughout the entire area, with the exception that a minimum height clearance of 7.5 metres is maintained throughout the entire collection point (including the loading and staging area), satisfying the minimum requirements of the Halton Region Waste Collection Standards. A minimum height clearance of 7.5 metres is provided above the entire length of the loading space to enable compacted bulk lift bin collection.

A 13 metre turning radius can be achieved for garbage trucks entering and exiting the proposed the loading along the outer edge of the vehicle turning envelope. This arrangement was confirmed through an updated vehicular manoeuvring analysis undertaken by BA Group. The turning radius of 13 metres has been included and annotated on the updated vehicle manoeuvring diagrams as requested. Additionally, the plans have been updated to include annotation of the required 18 metre long 'head-on approach'. This is illustrated on the figure (SPR-01) provided in **Appendix C**. Note that the proposed 18 metre head-on approach includes a portion (4.5 metres) of the east-west site driveway adjacent to the loading area that leads to parking ramp.



The use of a portion of the adjacent private driveway for the 18 metre head-on area is appropriate in this instance based on the following:

1. sufficient space within the 18m head-on length will still be available to manoeuvre the truck back and forth within the loading area while collecting waste bins;
2. the driveway adjacent to the loading area is not a continuous road (it only provides access to the underground parking) and as such the waste collection operations will not conflict with any significant traffic; and
3. increased safety measures are proposed in the Site plan to mitigate the conflict between the loading area and parking ramp, namely convex mirrors are proposed at the intersection of the parking ramp (allowing vehicles to be seen), and a warning system with flashing lights and signs is proposed to alert drivers exiting from the below-grade parking facility when the collection vehicle is backing out of the loading space to exit the area.

As illustrated in the vehicle maneuvering diagrams (VMD's) in **Appendix C**, there is sufficient space for either a front-end collection truck or a side loader collection truck to operate effectively within the proposed loading area. The VMD's also include an illustration of the location of the waste bin arrangement on collection day. Notably it is proposed that full bins would be located along the west wall of the loading area when the truck arrives thus providing space along the east wall to accommodate the vehicle manoeuvre. The bins would then be emptied and the empty bins would be shifted to the east wall to facilitate the reversing / exit manoeuvre of the waste collection truck. As illustrated in **Appendix C**, the maximum distance that a garbage truck would need to reverse along the private Site driveway is 7.0 metres.

The loading area will permit occupants of the vehicle to open both doors and exit the vehicle and walk the perimeter of the vehicle unhindered. There is sufficient space to accommodate the length of the truck with the forks extended to carry out waste collection of all waste receptacles.

The loading area meets the Region's requirements with a vertical clearance of 7.5 metres and a loading area width of 6 metres.

For the above-noted reasons, the proposed loading facilities are appropriate will meet the practical needs of the site.



7.0 TRANSPORTATION DEMAND MANAGEMENT (TDM)

7.1 TDM OBJECTIVES

The Transportation Demand Management (TDM) Plan strives to reduce automobile use through an on-going strategy that supports and promotes the use of non-auto transportation modes.

The key objective of the TDM Plan is to reduce peak hour single occupant automobile traffic by focusing on four specific policy areas:

1. Encourage the use of alternate travel modes (transit, cycling, walking);
2. Increase vehicle occupancy;
3. Shift travel to off-peak periods; and
4. Reduce vehicle kilometres travelled.

The physical infrastructure components or TDM measures outlined in this Plan (i.e. bicycle parking spaces) will be incorporated into the development design. The implementation of these elements and the associated costs will be the responsibility of the developer. The operational measures of the TDM plan (i.e. travel mode choice information packages) will be implemented by the developer.

7.2 PROPOSED TDM STRATEGIES

The existing and future area context provides for excellent public transit service (the Site is in proximity to the Oakville GO station and 5 local Oakville Transit routes) as well as travel by active transportation. Proposed TDM strategies, including a reduced parking supply with “unbundled” parking, active transportation facilities and travel mode information packages, have been developed to further support the use of non-auto modes of travel. As requested by the Town, additional measures have been added to the TDM Strategy since the previous submission, inclusive of the following:

- Communicate to tenants that discounted transit passes are available for customers as part of the low-income transit (SPLIT pass) through Halton Region. In addition, other incentives include kids under 12, ride free, the \$20 freedom pass for youth for unlimited rides after 4 PM and on weekends, seniors ride free on Mondays, as well as free (100% discount) Oakville Transit co-fare trips when transferring between Oakville Transit and the Oakville GO (see presto / GO Transit). This information will be made available to tenants, to incentivize transit use.
- One car share parking space will be provided at-grade in a visually prominent and accessible location.
- The cost of the tenant parking will be charged separately from the unit, with consideration that the cost of parking could exceed or equals equivalent transit fare.

7.2.1 Reduced Parking Supply

As discussed in Section 4.0, when compared to the minimum requirements of Zoning By-law 2014-014, a reduced parking supply of 330 spaces is being proposed for the site. As shown in **Table 14**, this results in a parking supply decrease of 6%.



TABLE 14 SUMMARY OF PARKING SUPPLY AND REQUIREMENTS

Land Use	Minimum Requirement Zoning By-law 2014-014 (spaces)	Proposed Parking Supply (spaces)
Resident	270	280
Resident Visitor	82	50
Site Total	352	330
<i>Reduction compared to Zoning By-law 2014-014</i>		<i>(-22 spaces) -6%</i>

7.2.2 Summary of Proposed TDM Strategies

Proposed TDM measures for the site are summarized in **Table 15**. The measures being proposed for the site are supportive of alternative transportation modes.

TABLE 15 TDM STRATEGIES

Measure	Description	Cost Estimate	Implementation Strategy
Physical Measures			
Pedestrian Facilities	Provide walkway connection from the new building to the adjacent property & formalize the connection on the west side of the building to provide connectivity to the existing sidewalk on Bartos Drive.	Integrated into overall development cost.	Construct as part of development.
Bicycle Parking	Long and short-term bicycle parking spaces to be provided in accordance Zoning By-law 2014-014.	Integrated into overall development cost.	Construct as part of development.
Bicycle Repair Station	Provide bicycle repair stations in long-term bicycle parking area(s).	Integrated into overall development cost.	Construct as part of development.
Vehicle Parking	Proposed reduced parking supply of 330 spaces is 6% less than the Zoning By-law 2014-014 requirement of 352 spaces.	Integrated into overall development cost.	Construct as part of development.
Car Share	1 Car Share space will be provided at-grade in a visually prominent	Integrated into overall development cost.	Car Share operator to be confirmed at a later time.



Measure	Description	Cost Estimate	Implementation Strategy
	and accessible location.		
Additional Measures			
Travel Mode Information Packages	Implement programs to inform new residents of available travel mode choices and existing mobile apps providing transit information.	To be determined.	Travel mode information packages will be distributed at the rental office.
Unbundled Parking	Charge a separate fee for parking that is additional to the monthly rent.	n/a	The cost of the tenant parking will be charged separately from the unit, with consideration that the cost of parking could exceed or equals equivalent transit fare.
Transit Incentives	Communicate to tenants that discounted transit passes are available for customers as part of the low-income transit (SPLIT pass) through Halton Region. Other incentives include kids under 12, ride free, the \$20 freedom pass for youth for unlimited rides after 4 PM and on weekends, seniors ride free on Mondays, as well as free (100% discount) Oakville Transit co-fare trips when transferring between Oakville Transit and the Oakville GO (see presto / GO Transit). This information will be made available to tenants, to incentivize transit use.	To be determined.	To be implemented at occupancy and during leasing activity.



8.0 TRAVEL DEMAND FORECASTS

8.1 EXISTING TRAFFIC VOLUMES

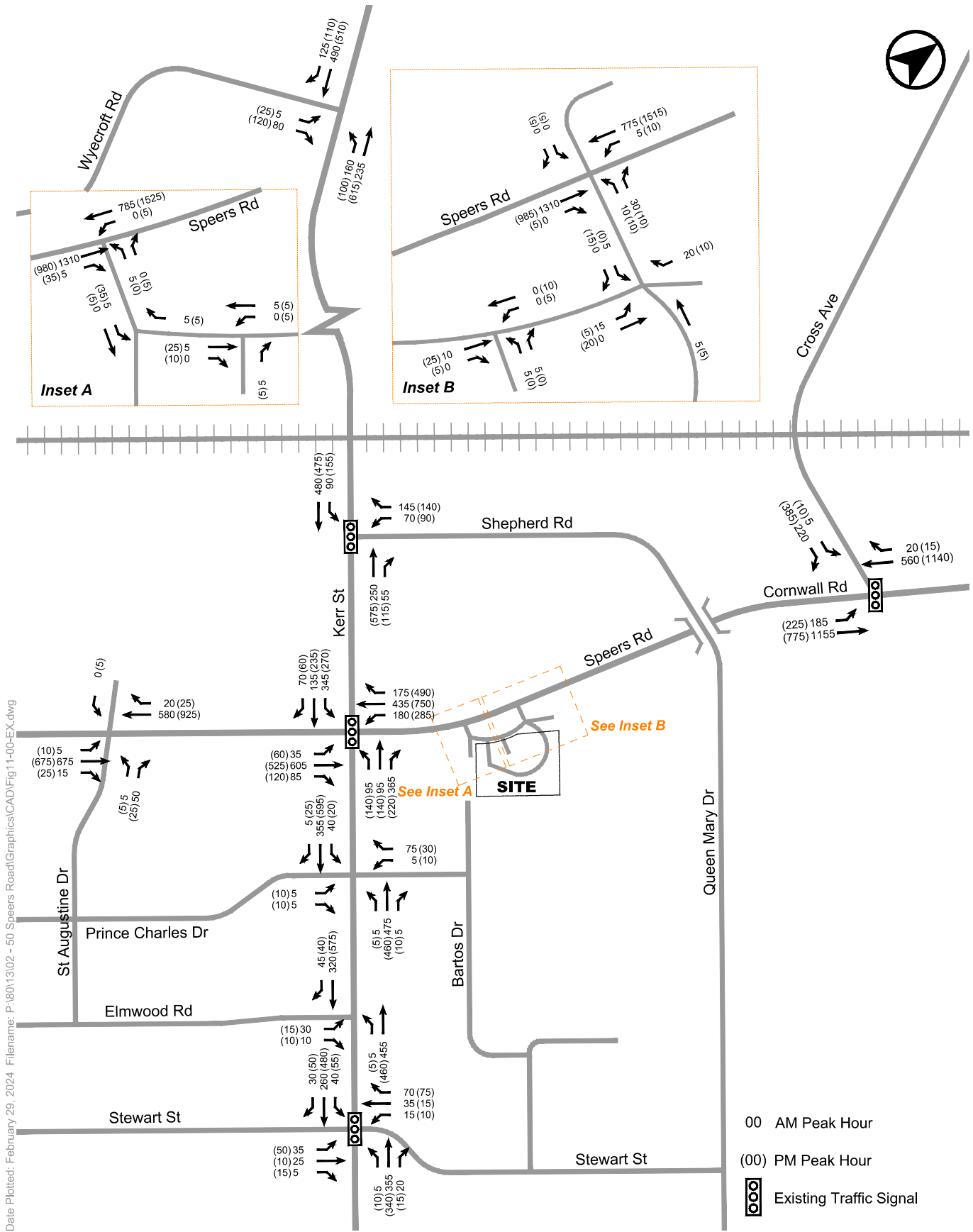
Consistent with the October 2022 BA Group Traffic Impact Study, traffic counts were conducted in November 2021 at all of the intersections being assessed within the study area. These traffic volumes have been adjusted and balanced where necessary in order to account for pre-pandemic traffic conditions on the major corridors. The balanced 2021 turning movement counts have been used as a baseline for existing traffic volumes at the intersections considered for this study. The intersections and sources of survey data used are summarized below in **Table 16**. Existing traffic volumes are illustrated in **Figure 11**.

TABLE 16 EXISTING TRAFFIC COUNT SUMMARY

Intersection	Control Type	Date of Count	Source
Kerr Street / Speers Road	Signalized	Wednesday, Nov 24 th , 2021	Spectrum Traffic Data Inc.
Speers Road / Cross Avenue			
Kerr Street / Sheppard Road			
Kerr Street / Stewart Street			
Kerr Street / Wyecroft Road	Unsignalized		
Prince Charles Drive / Kerr Street			
Elmwood Road / Kerr Street			
Speers Road / St. Augustine Drive			
Speers Road / Speers Service Road (West Access)			
Speers Road / Speers Service Road (East Access)			
Speers Service Road / 80 Speers Site Access			
Speers Service Road / 50 Speers PUDO			
Speers Service Road / Underground Access			
Speers Service Road / PUDO exit / Site Access			

Detailed existing turning movement count for all the intersections are shown in **Appendix D**.





Date Plotted: February 29, 2024 Filename: P:\801\13102 - 50 Speers Road\Graphics\CAD\Fig11-00-EX.dwg

FIGURE 11 EXISTING TRAFFIC VOLUMES

8.2 HORIZON YEARS

The traffic analysis was undertaken for the following horizon years;

- Existing conditions (2022);
- Future background conditions (2026) – with corridor growth and area background development traffic;
- Future total conditions (2026) – at build-out of site and inclusive of site generated traffic;
- Future total conditions (2031) – 5 years beyond build-out with site-generated traffic.

The traffic analysis was completed for a typical weekday for both the morning and afternoon peak periods.

8.3 BACKGROUND TRAFFIC VOLUMES

Traffic growth in the site vicinity has been considered based upon an evaluation of traffic volume changes related to:

- General corridor growth on the area arterial roads (i.e. Speers Road and Kerr Street); and
- Specific area development traffic (i.e. background development traffic);

8.3.1 Corridor Growth

In addition to considering specific allowances for area developments, historic traffic volumes for the weekday morning and afternoon peak hours at several key intersections within the study area were reviewed to determine whether the area has sustained any general growth along the major corridors of Speers Road and Kerr Street. This review suggested that over 8 years (2011 – 2019), there was average growth on Speers Road of 1.3% while Kerr Street recorded negative traffic growth. As a result, a general growth rate of 1.3% was applied on all through movements on both corridors consistent with other BA Group submissions around the study area.

The intersections of Speers Road / Cross Avenue, Kerr Street / Shepherd Road, Kerr Street / Wycroft Road and Kerr Street / Stewart Street, were also reviewed during the weekday morning and afternoon peak hours.

Detailed corridor growth analysis calculations are included in **Appendix E**.

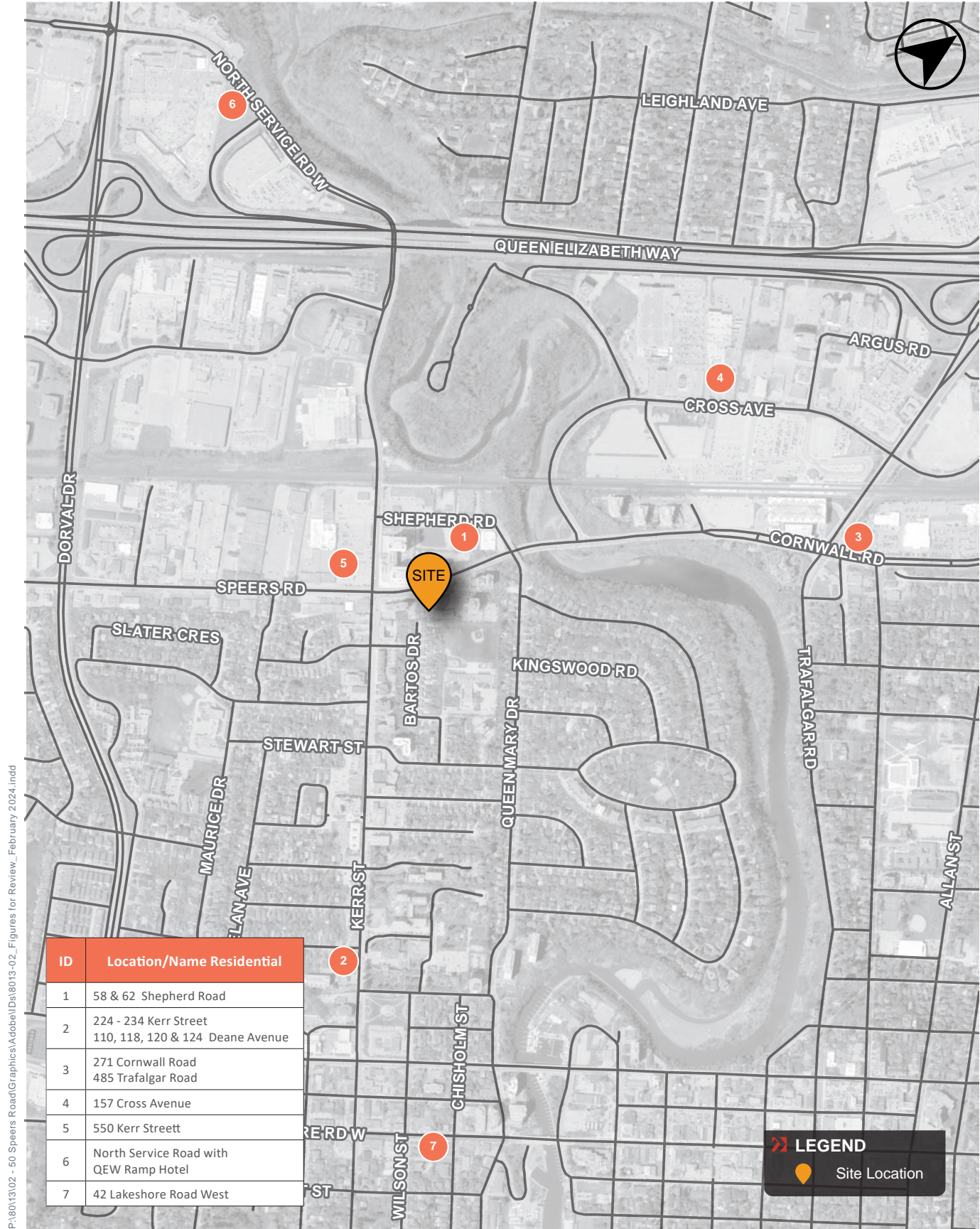
8.3.2 Background Developments

Background traffic includes specific allowances for traffic activity related to development proposals in the area that are either approved but not yet built or are being reviewed by the Town of Oakville.

For the updated traffic analysis, an updated review of the Town of Oakville Development Applications website was conducted for other active development applications in the area. A total of seven developments, including a total of 2,500 residential units and over 12,300 m² GFA of commercial space, were included in the future background traffic forecast. The proposed developments, land uses and their respective sources of transportation study are summarized in **Table 17** and illustrated in **Figure 12**.

The 2031 Background development traffic volumes are illustrated in **Figure 13**.





P:\8013\02 - 50 Speers Road\Graphics\Adobe\Ds\8013-02_Figures for Review_February 2024.indd

Aerial maps provided courtesy of: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, the GIS User Community and/or Google Earth/Maps.

ID	Location/Name Residential
1	58 & 62 Shepherd Road
2	224 - 234 Kerr Street 110, 118, 120 & 124 Deane Avenue
3	271 Cornwall Road 485 Trafalgar Road
4	157 Cross Avenue
5	550 Kerr Street
6	North Service Road with QEW Ramp Hotel
7	42 Lakeshore Road West

LEGEND

- Site Location

FIGURE 12 AREA BACKGROUND DEVELOPMENT

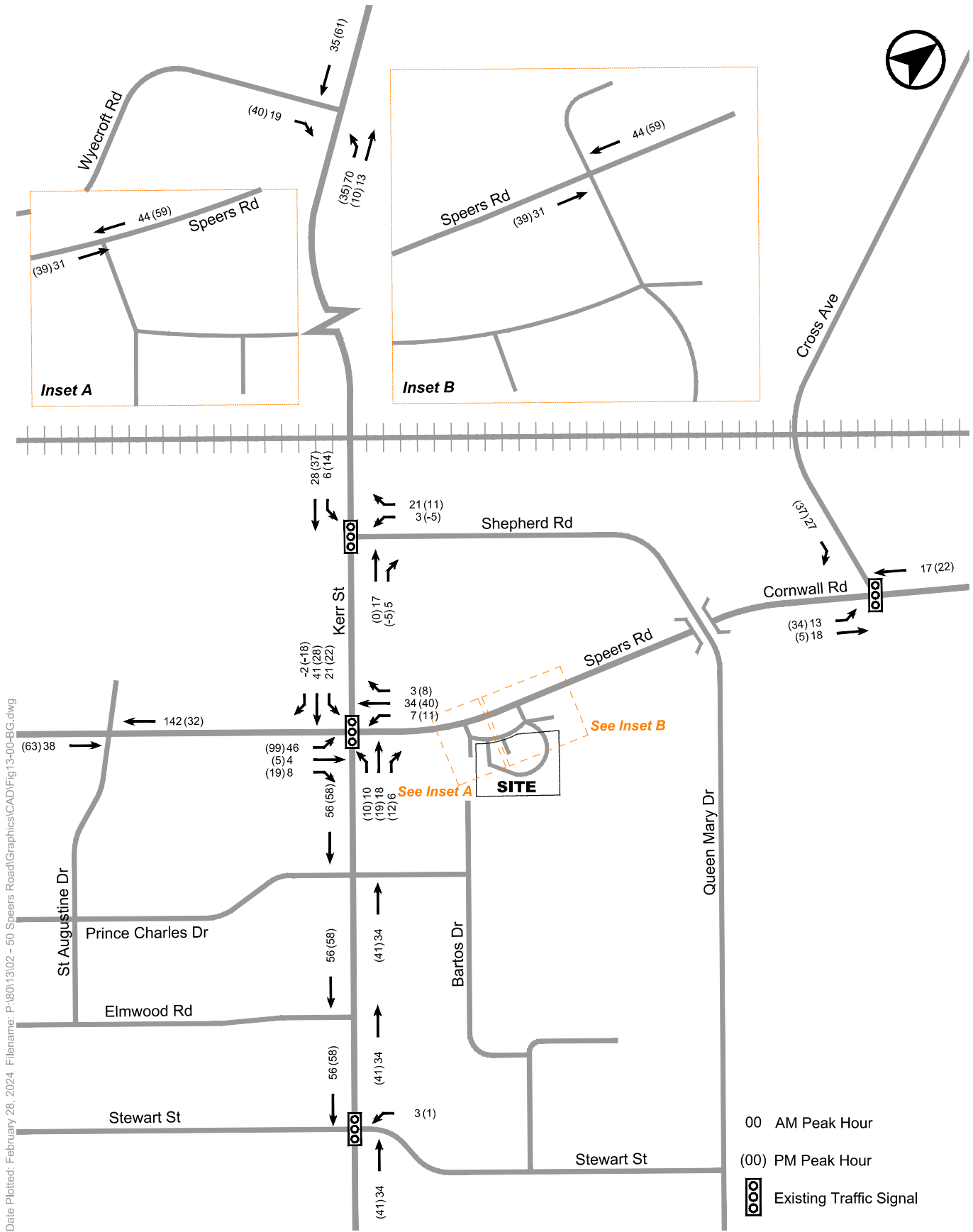


FIGURE 13 BACKGROUND DEVELOPMENT TRAFFIC VOLUMES

Date Plotted: February 28, 2024 Filename: P:\8013\02 - 50 Speers Road\Graphics\CAD\Fig 13-00-BG.dwg

TABLE 17 SUMMARY OF BACKGROUND DEVELOPMENTS

Background Development	Statistics	Transportation Study
58 & 62 Shepherd Road	192 condominium units, 9 live-work units	No TIS
224 - 234 Kerr Street, 110, 118, 120 & 124 Deane Avenue	126 apartment units 399 m ² retail GFA	No TIS
271 Cornwall Road & 485 Trafalgar Road	292 apartment units, 4,065 m ² retail GFA	R.J Burnside., July 2019
157 Cross Avenue	252 condominium units, 289 m ² retail GFA, 579 m ² office GFA	Trans-Plan, January 2019
Upper Kerr Village (550 Kerr Street ¹)	1,372 condominium units, 6,935 m ² retail GFA	BA Group, May 2022
North Service Road with QEW Ramp Hotel	114 hotel rooms	Trans-Plan, May 2020
42 Lakeshore Road West	152 apartment units, 630 m ² commercial retail GFA	LEA Consulting, August 2023

Notes:

1. These stats are based on the 2031 interim phase.

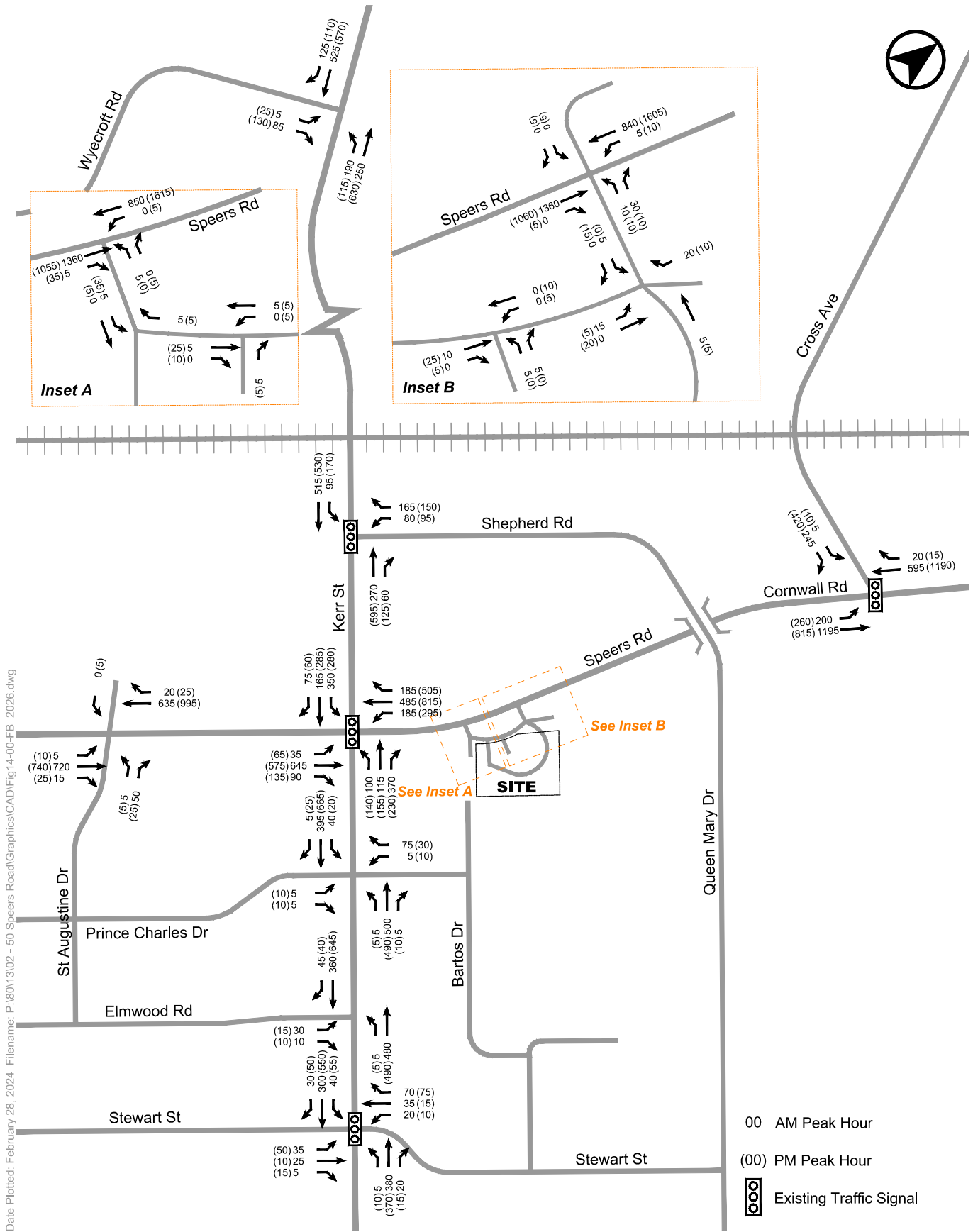
It is worth noting that for background developments with No TIS, the adopted proxy rates were used to generate trips based on the site stats. These trips were then assigned to the network using the trip distribution percentages.

8.3.3 Future Background Traffic

Total future background traffic volumes reflect a combination of existing road network volumes and future area development-related traffic activity.

Future background traffic volumes on the area road network for the weekday morning and afternoon peak hours. The 2026 and 2031 Future Background traffic volumes are illustrated in **Figure 14** and **Figure 15**, respectively.





Date Plotted: February 28, 2024 Filename: P:\801\13102 - 50 Speers Road\Graphics\CAD\Fig14-00-FB_2026.dwg

FIGURE 14 2026 FUTURE BACKGROUND TRAFFIC VOLUMES

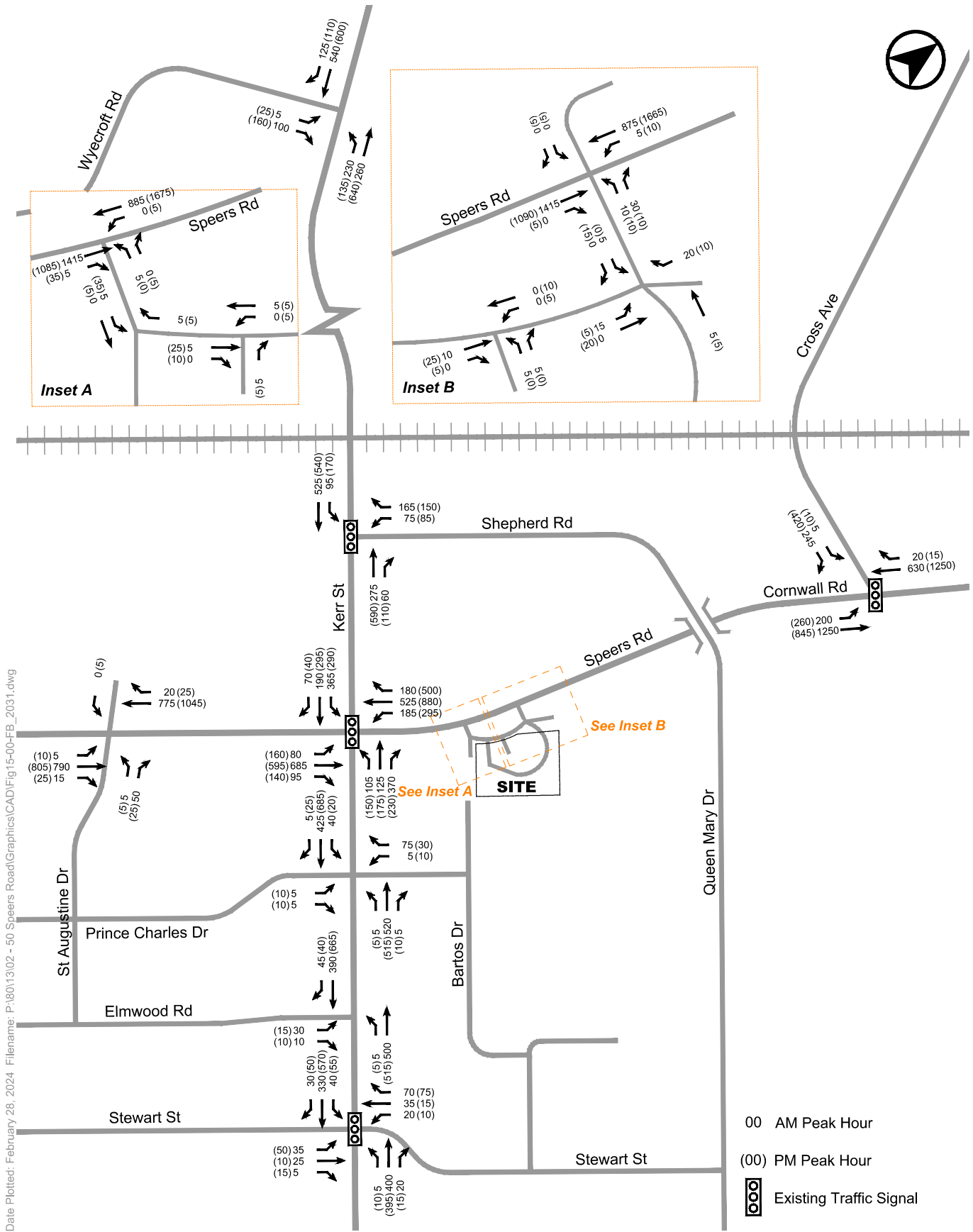


FIGURE 15 2031 FUTURE BACKGROUND TRAFFIC VOLUMES

8.4 SITE TRAFFIC VOLUMES

The impacts of the site on traffic operations in the study area include the removal of traffic associated with the existing 59 residential units and the addition of traffic associated with proposed residential redevelopment with 330 units.

8.4.1 Existing Site Traffic

The existing site generates approximately 20 and 35 two-way vehicle trips during the weekday morning and afternoon peak hours, respectively, split between all of the site accesses. Traffic volumes associated with the existing site that were removed from the network are illustrated in **Figure 16**.

8.4.2 Trip Generation

8.4.2.1 Vehicle Trip Generation

Residential vehicle trip generation was established based upon a review of trip generation rates from the ITE Trip Generation Manual (11th Edition) for General Urban/Suburban settings, as well as proxy trip generation counts of residential developments undertaken by BA Group at comparable sites with similar contexts within the Greater Toronto Area (GTA) and Oakville. The results of the weekday morning and afternoon residential site vehicle traffic volumes are summarized in **Table 18**.

TABLE 18 PROXY RESIDENTIAL VEHICLE TRIP GENERATION RATE REVIEW

Proxy Site Location	Survey Date	Number of Units	AM Peak Hour			PM Peak Hour		
			In	Out	2-Way	In	Out	2-Way
1297 Marlborough Crt & 1360 White Oaks Blvd Oakville	Thu, Sept 26, 2019	266	0.09	0.17	0.26	0.19	0.13	0.32
75-95 Charolais Blvd Brampton	Thu, Aug 29, 2019	574	0.07	0.17	0.24	0.20	0.10	0.29
430 McMurphy Ave S Brampton	Thu, Aug 29, 2019	271	0.04	0.15	0.18	0.12	0.10	0.22
440 McMurphy Ave S Brampton	Thu, Aug 29, 2019	271	0.09	0.17	0.25	0.22	0.13	0.35
210-220 Steeles Ave W Brampton	Thu, Aug 29, 2019	508	0.02	0.17	0.19	0.16	0.07	0.24
	Tue, May 14, 2019		0.04	0.20	0.25	0.15	0.07	0.22
ITE222 – Multifamily Housing (High-Rise) <i>General Urban/Suburban – Not Close to Rail Transit</i>			0.08	0.21	0.29	0.21	0.12	0.33
Adopted Average Vehicle Trip Rate (Including ITE)			0.06	0.18	0.24	0.18	0.10	0.28
Residential Site Vehicle Trips (330 units)			20	60	80	60	35	95

The proposed development is anticipated to generate in the order of **80 and 95 two-way vehicle trips**, during the weekday morning and afternoon peak hours, respectively.



8.4.2.2 Residential Mode Share

Modal share characteristics for resident (home-based) travel during the morning and afternoon peak periods are summarized in **Table 19** and are based on a 2016 Transportation Tomorrow Survey (TTS) data query.

TABLE 19 RESIDENTIAL MODE SHARE (TTS 2016)

Mode	Morning Peak Period Outbound	Afternoon Peak Period Inbound
Auto Driver	57%	64%
Auto Passenger	13%	8%
Transit	21%	17%
Walk	7%	9%
Cycle	1%	2%

Notes:

1. Based on 2016 TTS results for morning (6:00 - 8:59) and afternoon (15:00 - 17:59) peak traffic periods for 2006 GTA Zones 4009, and 4011–4013.
2. Auto passenger trips (includes auto passengers, school bus passengers and taxi passengers).

The TTS travel data demonstrates that site study area has an auto driver mode share in the order of 57% for morning outbound and 64% for afternoon inbound home-based trips, during the peak travel periods. Non-auto trips (i.e. transit, walking and cycling) account for approximately 29% of all home-based trips made in the morning outbound and 28% in the afternoon inbound, during the peak travel periods.

8.4.3 Total Site Vehicle Trip Forecast

Total automobile trips associated with the site are summarized in **Table 20**, including trips associated with residential uses, as well as the removal of trips associated with the existing site.

TABLE 20 VEHICLE TRIP GENERATION

Site	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Adopted Residential Vehicle Trip Generation Rate (per Unit)	0.06	0.18	0.24	0.18	0.10	0.28
Total New Residential Vehicle Trips (330 Units)	20	60	80	60	35	95
Total New Site Trips (number of vehicles)	20	60	80	60	35	95
Existing Site Trips to be Removed	0	-20	-20	-25	-10	-35
Net New Site Traffic Volumes (number of vehicles)	20	40	60	35	25	60

The redevelopment of the site is forecasted to have a net impact of approximately **60 two-way vehicle trips** during both the weekday morning and afternoon peak hours.



8.4.4 Trip Distribution and Assignment

Trip distribution patterns and traffic route assignment were derived from the 2016 Transportation Tomorrow Survey (TTS) for 2006 GTA Zones 4009, and 4011-4013. Queries for residential trips are provided in **Appendix F**. The adopted distribution of inbound and outbound vehicle traffic is presented in **Table 21**.

TABLE 21 SITE TRIP DISTRIBUTION

Directions	Residential	
	Outbound ¹	Inbound ²
To/From East on Highway 403	38%	31%
To/From West on Highway 403	21%	10%
To/From North on Kerr St	7%	9%
To/From South on Kerr St	8%	10%
To/From South on Dorval Dr	6%	2%
To/From East on Speers Rd	8%	16%
To/From West on Speers Rd	4%	12%
To/From West on Wyecroft Rd	4%	5%
To/From South on Queen Mary Dr	4%	5%
Total	100%	100%

Notes:

1. Based upon morning peak period residential outbound trips
2. Based upon afternoon peak period residential inbound trips
3. Based upon afternoon peak period retail outbound trips
4. Based upon afternoon peak period retail inbound trips
5. Based on trips to/from TTS zones 4009 and 4011-4013

Existing trips to be removed are summarized in **Figure 16**. New site trips associated with the residential development are illustrated in **Figure 17** while the net new trips resulting from the redevelopment of the site are illustrated in **Figure 18**.

8.5 FUTURE TOTAL TRAFFIC VOLUMES

Future total traffic volumes during the weekday morning and afternoon peak hours, reflect the sum of future background traffic volumes and new site traffic volumes. The 2026 and 2031 Future Total traffic volumes are illustrated in **Figure 19** and **Figure 20**, respectively.



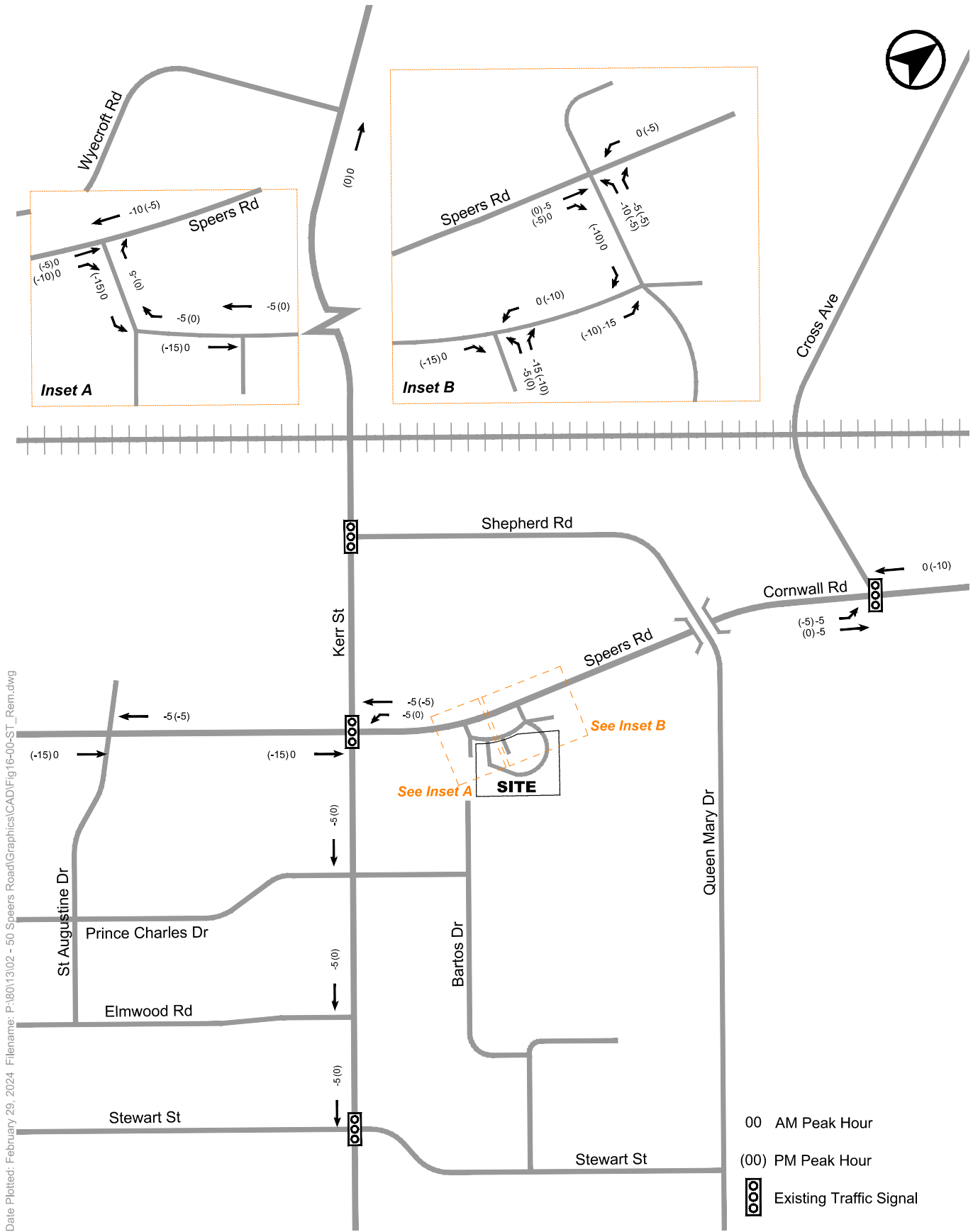


FIGURE 16 EXISTING SITE TRAFFIC VOLUMES TO BE REMOVED

Date Plotted: February 29, 2024 Filename: P:\801\13102 - 50 Speers Road\Graphics\CAD\Fig 16-00-ST_Rem.dwg

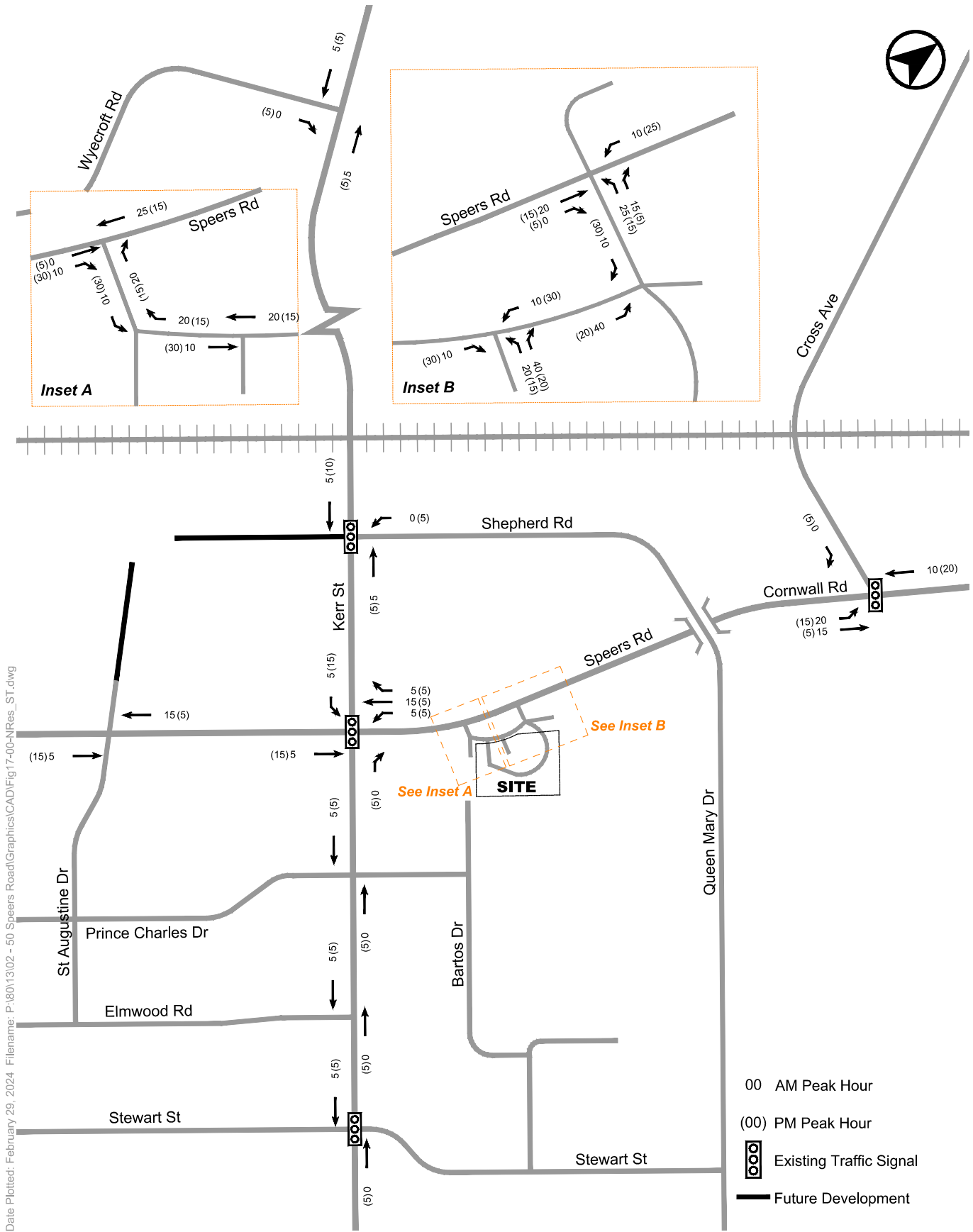


FIGURE 17 NEW RESIDENTIAL SITE TRAFFIC VOLUMES

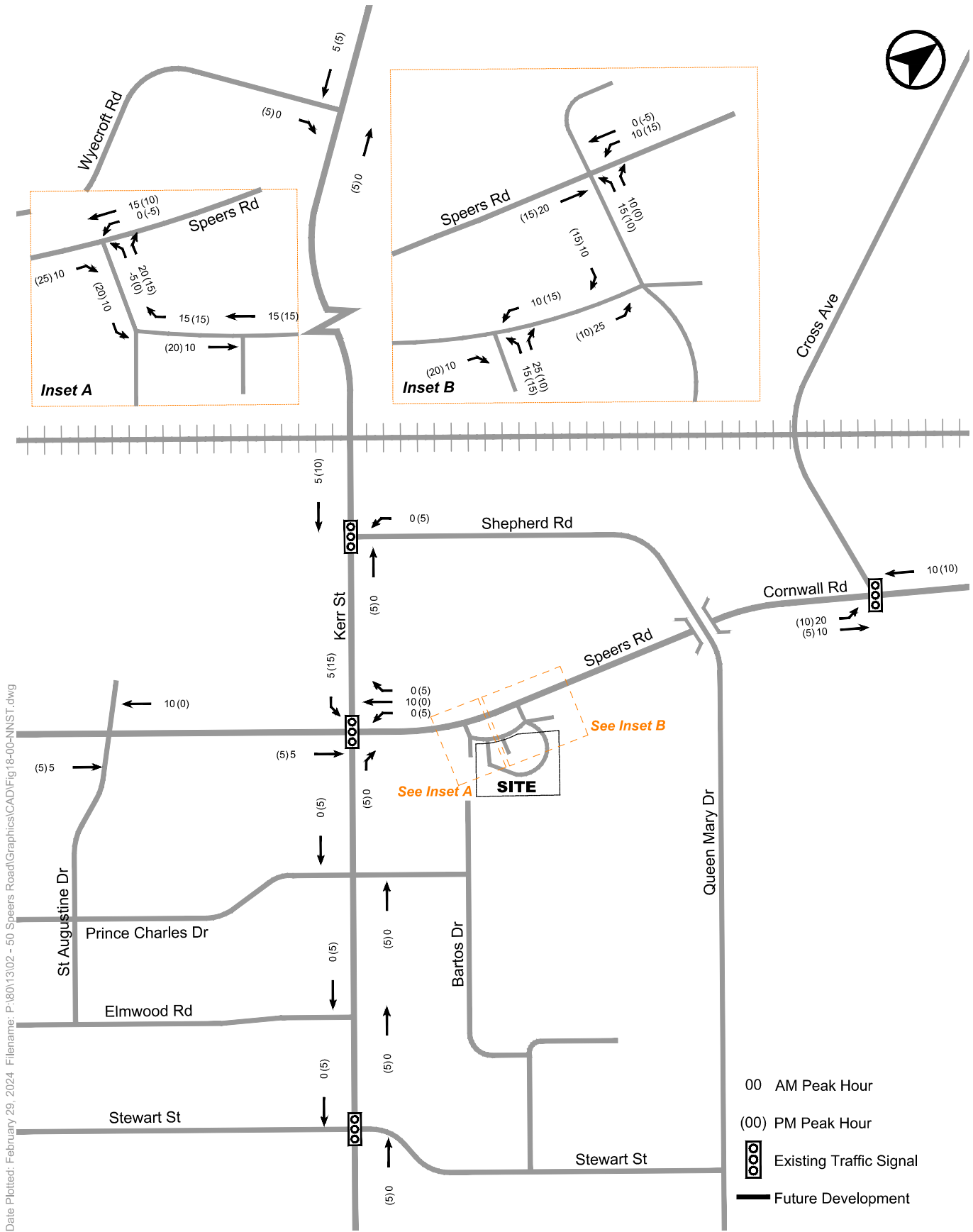


FIGURE 18 NET NEW SITE TRAFFIC VOLUMES

Date Plotted: February 29, 2024 Filename: P:\8013\02 - 50 Speers Road\Graphics\CAD\Fig 18-00-NNST.dwg

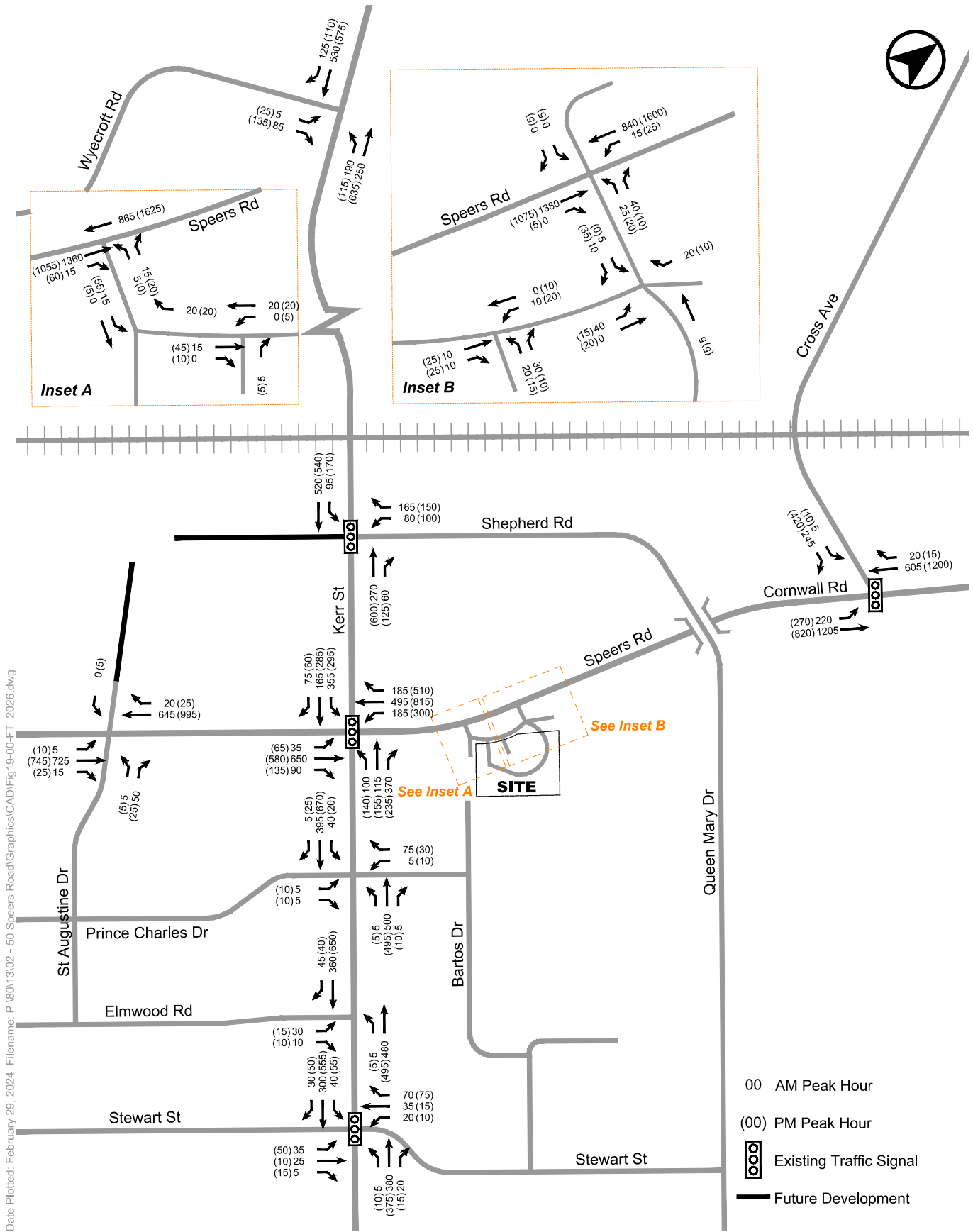
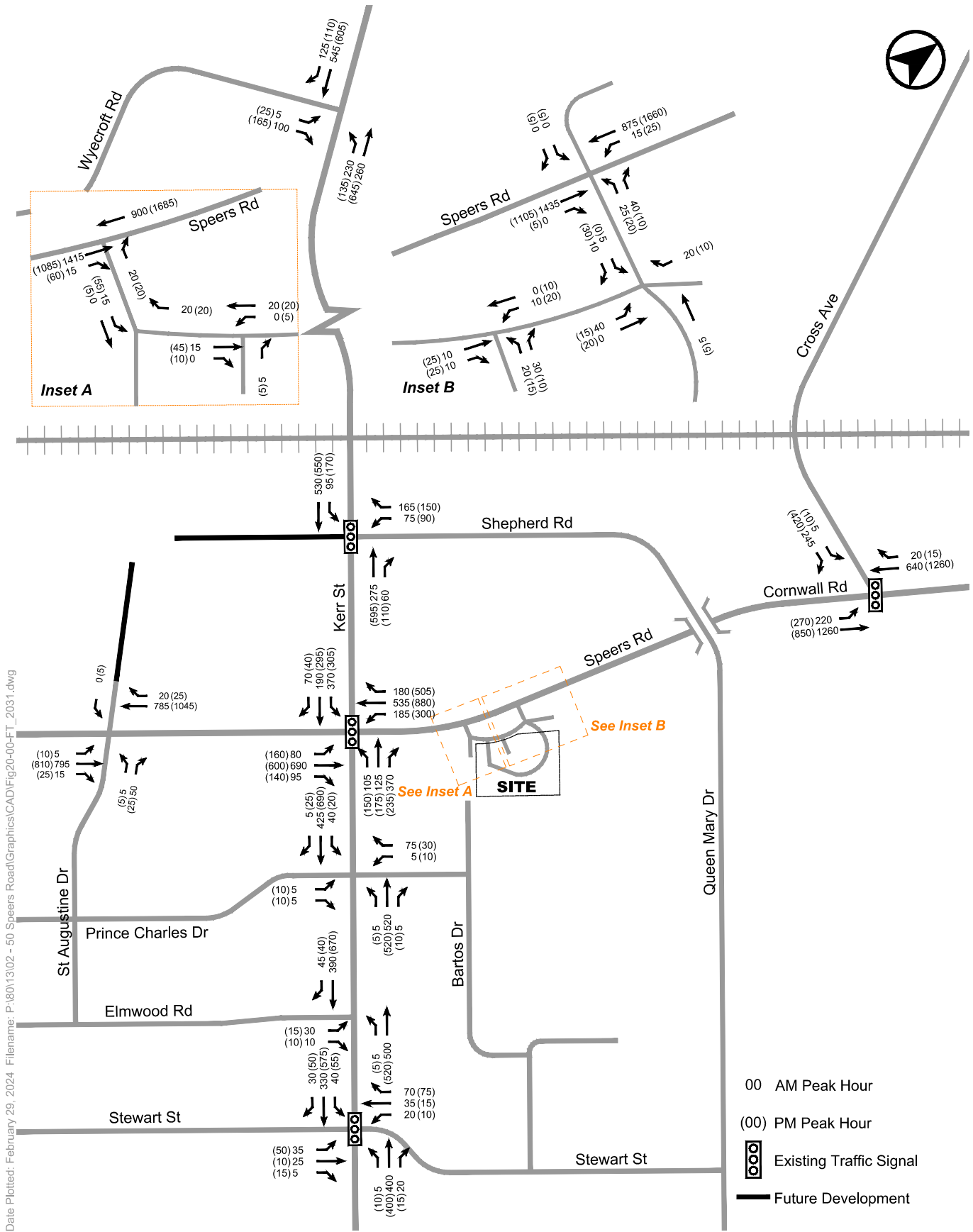


FIGURE 19 FUTURE TOTAL TRAFFIC VOLUMES (2026)

Date Plotted: February 29, 2024 Filename: P:\8013\13102 - 50 Speers Road\Graphics\CAD\Fig19-00-FT_2026.dwg



Date Plotted: February 29, 2024 Filename: P:\801\13102 - 50 Speers Road\Graphics\CAD\Fig20-00-FT_2031.dwg

FIGURE 20 FUTURE TOTAL TRAFFIC VOLUMES (2031)

9.0 UPDATED TRAFFIC OPERATIONS ANALYSIS

The traffic operations analysis has been undertaken during the weekday morning and afternoon street peak hours under the traffic conditions outlined in **Section 8.2** and is consistent with the methodology of BA Group's October 2022 Traffic Impact Study.

9.1 STUDY AREA INTERSECTIONS

Traffic operations and impacts related to the net new traffic volumes generated by the site, have been reviewed at the following area intersections:

Signalized Intersections

- Kerr Street / Speers Road
- Speers Road / Cross Avenue
- Kerr Street / Sheppard Road
- Kerr Street / Stewart Street

Unsignalized Intersections

- Kerr Street / Wyecroft Road
- Kerr Street / Prince Charles Drive
- Kerr Street / Elmwood Road
- St. Augustine Drive / Speers Road
- Speers Service Road (East Access) / Speers Road / 41 Speers Driveways
- Speers Service Road (West Access) / Speers Road
- 80 Speers Parking Lot / Speers Service Road
- 50 Speers PUDO / Speers Service Road
- Speers Service Road / 50 Speers Underground Access
- Speers Service Road / 30 Speers Site Access / 50 Speers PUDO

9.2 ANALYSIS METHODOLOGY AND ASSUMPTIONS

9.2.1 Intersection Capacity Analysis Methodology

Consistent with the October 2022 BA report, the traffic operations analysis has been completed using the Synchro (Version 11) software package following the methodologies outlined in the *Highway Capacity Manual (HCM 2000)*. All other assumptions and traffic signal timings as outlined in the October 2022 BA Group Traffic Impact Study remain valid. Where necessary, traffic signal timing plans have been optimized in future scenarios.

The existing traffic signal timing plans are provided in **Appendix G**.



9.2.2 Kerr Street Grade Separation Project Deferred

A recent announcement from Metrolinx indicates that the proposed Kerr Street Underpass project (grade separation at the existing railway), that was approved after completion of an Environmental Assessment Study, has been indefinitely deferred due to the increased cost estimate of the project.

As a result of the indefinite deferral of this grade separation project, the Town has requested that the following two scenarios be considered as part of the updated traffic analysis:

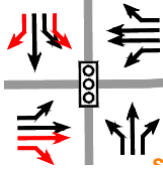
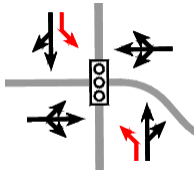
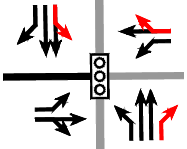

1. Grade separation, road widening, intersection improvement, turning lanes, and active transportation infrastructure **in place** by 2026 and 2031 horizon years.
2. Grade separation and associated improvement **deferred** beyond the 2031 horizon year.

A summary of the planned upgrades considered in Scenario #1 are summarized in **Table 22** and highlighted in red. The planned upgrades are further illustrated in **Figure 7**.

As per the findings of the updated analysis, it was determined that the impacts of the development proposal are minor and can be accommodated in both future scenarios. The future grade separation and improvements to Kerr Street are therefore not required to accommodate the site traffic.



TABLE 22 LANE CONFIGURATION COMPARISON

Location	Future Planned Upgrades Noted in Red
Kerr Street Railway Crossing	Grade separation in Scenario #1 and at-grade crossing remains in Scenario #2.
Kerr Street & Speers Road	
Kerr Street & Stewart Street	
Kerr Street & Sheppard Road	
Kerr Street & Wyecroft Road	



9.2.3 Overview of Traffic Analysis Scenarios

9.2.3.1 Scenario #1 – All Planned Improvements Completed by 2026 and 2031:

This scenario assumed that the grade separation on Kerr Street, road widening along Kerr and Speers Road, including the addition of all dedicated turning lanes and planned active transportation infrastructure, have all been completed by the 2026 future background traffic condition.

9.2.3.2 Scenario #2 – No Improvements by 2026 and 2031:

This scenario assumes that the existing lane configurations at the study area intersections are maintained in the analysis of the future conditions. Therefore, no intersection improvements, road widenings or the grade separation project at Kerr Street, have been included as part of this scenario.

9.2.4 Safety-Related Improvements at Speers Road / Service Road Accesses

The existing road network configuration was assumed for existing conditions, including the east and west points of access at Speers Road / Service Road. The updated traffic analysis has been revised to include further analysis for left-turning vehicles at the site access driveways along Speers Road. In addition, an analysis of possible options for potential improvements to Speers Road was undertaken that considered the following:

- Existing turning movements at the existing Service Road (both east and west points of access);
- Existing constraints associated with the adjacent properties; and
- Available right-of-way.

Based on this analysis, modifications to the west Service Road intersection with Speers Road, that will improve the level of safety for left-turning vehicles travelling in/out of the Service Road, are being recommended and proposed by the developer. The proposed modifications include restricting movements to right-in/ right-out only at the west access on Speers Road. An unsignalized access with full movements permitted, would be maintained at the east intersection of the Service Road with Speers Road. The level of safety related to left-turning vehicle movements from the Site and from the neighbouring 30 and 80 Speers Road properties, would be improved by ensuring that all left turns occur at the east Service Road intersection on Speers Road, which has the optimal geometry to accommodate left turns.

The recommended site access configuration noted above was considered for all future total horizons in the updated traffic analysis. The updated traffic analysis demonstrates that all left turns can be accommodated at the east Service Road intersection. A plan that illustrates the proposed modifications to the west intersection to restrict movements to right-in right-out is provided in **Appendix K**, along with a pavement marking and signage plan. It is noted that options for making the Service Road one-way were also considered as part of BA Group's assessment.

However, based on BA Group's review of the operational needs, it was concluded that the Service Road must remain two-way in order to appropriately accommodate the various service vehicles e.g. garbage trucks coming to/from the site and adjacent buildings. Two-way traffic is also required to ensure vehicles can access the east Service Road intersection which is where left-turn movements are recommended to be accommodated.



9.3 TRAFFIC ANALYSIS SUMMARY

Detailed Synchro analysis worksheets are provided in **Appendix H**. A discussion of the traffic analysis results is provided in the following sections.

9.4 SIGNALIZED INTERSECTION ANALYSIS

9.4.1 Scenario #1 – All Planned Improvements Completed by 2026 and 2031

A summary of the traffic analysis results for the signalized intersections within the study area is provided in the following sections.

9.4.1.1 Kerr Street / Speers Road

The **Kerr Street / Speers Road** intersection operates under traffic signal control with a cycle length of 120 seconds, during the weekday morning and afternoon peak hour. The existing cycle lengths were maintained in all analysis scenarios, with minor adjustments to traffic signal phase splits. A summary of the traffic analysis results for this intersection is provided in **Table 23**.

Under existing traffic conditions, the intersection operates at an acceptable level of service during the weekday morning peak hours with overall v/c ratios of 0.62. The weekday afternoon peak hour has an overall v/c ratio of 0.73.

Under the 2026 future background conditions, with the allowances for specific area developments, along with the intersection upgrades following the planned road network improvements, the intersection operates at an acceptable level of service, during the weekday morning and afternoon peak hours, with overall v/c ratios of 0.51 and 0.68, respectively.

With the addition of site-related traffic, under future total traffic conditions the intersection continues to operate at an acceptable level of service, with the v/c ratios for all movements remaining under 1.0, during the weekday morning and afternoon peak hours, for both the 2026 and the 2031 horizon years.



TABLE 23 KERR STREET / SPEERS ROAD CAPACITY ANALYSIS RESULTS

Movement	Existing Traffic		Future Background (2026)		Future Total (2026)		Future Total (2031)	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
EBL	0.08 (0.18)	B (B)	0.08 (0.20)	B (B)	0.08 (0.20)	B (B)	0.18 (0.50)	B (B)
EBT	-- (--)	-- (--)	0.41 (0.39)	C (C)	0.42 (0.39)	C (C)	0.45 (0.40)	C (C)
EBR	-- (--)	-- (--)	0.06 (0.09)	B (B)	0.06 (0.09)	B (B)	0.06 (0.09)	B (B)
EBTR	0.50 (0.45)	C (C)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
WBL	0.51 (0.68)	B (B)	0.44 (0.64)	B (B)	0.45 (0.65)	B (B)	0.47 (0.66)	B (B)
WBT	0.27 (0.45)	B (C)	0.28 (0.48)	B (C)	0.28 (0.48)	B (C)	0.32 (0.55)	B (C)
WBR	0.12 (0.35)	B (C)	0.13 (0.36)	B (B)	0.13 (0.36)	B (B)	0.13 (0.41)	B (C)
NBL	0.33 (0.55)	D (D)	0.32 (0.57)	D (D)	0.32 (0.57)	D (D)	0.33 (0.63)	D (D)
NBT	0.32 (0.45)	D (D)	0.37 (0.44)	D (D)	0.37 (0.44)	D (D)	0.39 (0.50)	D (D)
NBR	0.67 (0.16)	D (D)	0.70 (0.16)	E (D)	0.71 (0.17)	E (D)	0.73 (0.17)	E (D)
SBL	0.70 (0.68)	C (D)	0.47 (0.41)	C (C)	0.47 (0.44)	C (C)	0.49 (0.47)	C (C)
SBT	-- (--)	-- (--)	0.43 (0.75)	D (D)	0.42 (0.75)	D (D)	0.47 (0.76)	D (D)
SBR	-- (--)	-- (--)	0.05 (0.04)	D (D)	0.05 (0.04)	D (D)	0.05 (0.03)	D (D)
SBTR	0.41 (0.76)	D (D)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
Overall	0.62 (0.73)	C (C)	0.51 (0.68)	C (C)	0.52 (0.69)	C (C)	0.54 (0.71)	C (C)

Notes:

1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour)
2. Blank cells reflect intersection movements that do not exist under the particular scenario.

Based on the foregoing, the traffic generated by the proposed development can be acceptably accommodated at the **Kerr Street / Speers Road** intersection. No mitigation measures or additional improvements are recommended at this intersection.

9.4.1.2 Speers Road / Cross Avenue

The **Speers Road / Cross Avenue** intersection operates under traffic signal control with a cycle length of 140 seconds, during the weekday morning and afternoon peak hour. The existing cycle lengths were maintained in all analysis scenarios, with minor adjustments to traffic signal phase splits. A summary of traffic analysis results for this intersection is provided in **Table 24**.

Under existing traffic conditions, the intersection operates at an acceptable level of service, during the weekday morning peak hours with overall v/c ratios of 0.39. The weekday afternoon peak hour has an overall v/c ratio of 0.60.

Under the 2026 future background conditions, with the allowances for specific area developments, the intersection operates at an acceptable level of service, during the weekday morning and afternoon peak hours, with overall v/c ratios of 0.40 and 0.65, respectively.



With the addition of site-related traffic under future total traffic conditions, the intersection continues to operate at an acceptable level of service, with v/c ratios for all movements remaining under 1.0, during the weekday morning and afternoon peak hours, for both the 2026 and the 2031 horizon years.

TABLE 24 SPEERS ROAD / CROSS AVENUE CAPACITY ANALYSIS RESULTS

Movement	Existing Traffic		Future Background (2026)		Future Total (2026)		Future Total (2031)	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
EBL	0.30 (0.60)	A (A)	0.33 (0.65)	A (B)	0.36 (0.64)	A (B)	0.38 (0.64)	A (C)
EBT	0.40 (0.27)	A (A)	0.41 (0.29)	A (A)	0.41 (0.29)	A (A)	0.43 (0.30)	A (A)
WBTR	0.23 (0.48)	A (B)	0.25 (0.55)	A (B)	0.25 (0.58)	A (B)	0.27 (0.63)	A (B)
SBL	0.04 (0.07)	E (E)	0.04 (0.06)	E (E)	0.04 (0.06)	E (E)	0.04 (0.06)	E (E)
SBR	0.08 (0.42)	E (E)	0.09 (0.56)	E (E)	0.09 (0.57)	E (E)	0.09 (0.59)	E (E)
Overall	0.39 (0.60)	A (B)	0.40 (0.65)	B (B)	0.41 (0.65)	B (C)	0.43 (0.65)	B (C)

Notes:

1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour)

Based on the foregoing, the traffic generated by the proposed development can be acceptably accommodated at the **Speers Road / Cross Avenue** intersection. No mitigation measures or improvements are recommended at this intersection.

9.4.1.3 Kerr Street / Shepherd Road

The **Kerr Street / Shepherd Road** intersection operates under traffic signal control with a cycle length of 86 seconds during the weekday morning and afternoon peak hours. The existing cycle lengths were maintained in all analysis scenarios, with minor adjustments to traffic signal phase splits. A summary of traffic analysis results for this intersection is provided in **Table 25**.

Under existing traffic conditions, the intersection operates at an acceptable level of service, during the weekday morning and afternoon peak hours, with overall v/c ratios of 0.43 and 0.57, respectively.

Under the 2026 future background conditions, with the allowances for specific area developments, along with the change in lane configuration following the planned road network improvements, the intersection operates at an acceptable level of service, during the weekday morning peak hours, with overall v/c ratios of 0.34. The weekday afternoon peak hour has an overall v/c ratio of 0.46.

With the addition of site-related traffic under future total traffic conditions, the intersection continues to operate at an acceptable level of service, with all v/c ratios for all movements remaining under 1.0, during the weekday morning and afternoon peak hours, for both the 2026 and the 2031 horizon years.



TABLE 25 KERR STREET / SHEPHERD ROAD CAPACITY ANALYSIS RESULTS

Movement	Existing Traffic		Future Background (2026)		Future Total (2026)		Future Total (2031)	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
EBL	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	0.46 (0.32)	C (C)
EBTR	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	0.08 (0.05)	C (C)
WBLR	0.30 (0.38)	B (B)	0.42 (0.48)	B (B)	0.42 (0.50)	B (B)	-- (--)	-- (--)
WBL	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	0.36 (0.41)	C (C)
WBTR	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	0.12 (0.12)	B (B)
NBT	-- (--)	-- (--)	0.21 (0.48)	B (B)	0.21 (0.49)	B (B)	0.22 (0.50)	B (B)
NBR	-- (--)	-- (--)	0.04 (0.08)	A (B)	0.04 (0.08)	A (B)	0.04 (0.07)	B (B)
NBL	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	0.19 (0.47)	B (B)
NBTR	0.18 (0.41)	A (A)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
SBL	-- (--)	-- (--)	0.16 (0.34)	A (A)	0.16 (0.34)	A (A)	0.17 (0.37)	A (A)
SBT	-- (--)	-- (--)	0.26 (0.26)	A (A)	0.26 (0.27)	A (A)	0.29 (0.29)	A (A)
SBR	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	0.01 (0.03)	A (A)
SBTL	0.40 (0.56)	A (A)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
Overall	0.43 (0.57)	A (A)	0.34 (0.46)	A (B)	0.34 (0.47)	A (B)	0.36 (0.44)	B (B)

Notes:

1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour)
2. Blank cells reflect intersection movements that do not exist under that particular scenario.

Based on the foregoing, the traffic generated by the proposed development can be acceptably accommodated at the **Kerr Street / Shepherd Road** intersection. No mitigation measures or additional improvements are recommended at this intersection.

9.4.1.4 Kerr Street / Stewart Street

The **Kerr Street / Stewart Street** intersection operates under traffic signal control with a cycle length of 75 seconds, during the weekday morning and afternoon peak hour. The existing cycle lengths were maintained in all analysis scenarios, with minor adjustments to traffic signal phase splits. A summary of traffic analysis results for this intersection is provided in **Table 26**.

Under existing traffic conditions, the intersection operates at an acceptable level of service during the weekday morning peak hours with overall v/c ratios of 0.33. The weekday afternoon peak hour has an overall v/c ratio of 0.52.

Under future background conditions, with the allowances for specific area developments, the intersection operates at an acceptable level of service during the weekday morning and afternoon peak hours with overall v/c ratios of 0.37 and 0.50, respectively.



With the addition of site-related traffic under future total traffic conditions, the intersection continues to operate at an acceptable level of service, with v/c ratios for all movements remaining under 1.0, during the weekday morning and afternoon peak hours, for both the 2026 and the 2031 horizon years.

TABLE 26 KERR STREET / STEWART STREET CAPACITY ANALYSIS RESULTS

Movement	Existing Traffic		Future Background (2026)		Future Total (2026)		Future Total (2031)	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
EBTLR	0.27 (0.29)	C (C)	0.28 (0.29)	C (C)	0.28 (0.29)	C (C)	0.28 (0.29)	C (C)
WBTLR	0.25 (0.15)	C (C)	0.27 (0.15)	C (C)	0.27 (0.15)	C (C)	0.27 (0.15)	C (C)
NBL	-- (--)	-- (--)	0.01 (0.02)	A (A)	0.01 (0.03)	A (A)	0.01 (0.03)	A (A)
NBTR	-- (--)	-- (--)	0.40 (0.38)	A (A)	0.40 (0.39)	A (A)	0.42 (0.41)	A (A)
NBTLR	0.33 (0.32)	A (A)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
SBL	-- (--)	-- (--)	0.07 (0.10)	A (A)	0.07 (0.10)	A (A)	0.07 (0.10)	A (A)
SBTR	-- (--)	-- (--)	0.29 (0.52)	A (A)	0.29 (0.53)	A (A)	0.31 (0.54)	A (A)
SBTLR	0.31 (0.55)	A (A)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
Overall	0.33 (0.52)	A (A)	0.37 (0.50)	B (B)	0.37 (0.50)	B (B)	0.38 (0.51)	B (B)

Notes:

1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour)

Based on the foregoing, the traffic generated by the proposed development can be acceptably accommodated at the **Kerr Street / Stewart Street** intersection. No mitigation measures or improvements are recommended at this intersection.

9.4.2 Scenario #2 – No Improvements in Place by 2026 and 2031

9.4.2.1 Kerr Street / Speers Road

The **Kerr Street / Speers Road** intersection operates under traffic signal control with a cycle length of 120 seconds, during the weekday morning and afternoon peak hour. The existing cycle lengths were maintained in all analysis scenarios, with minor adjustments to traffic signal phase splits. A summary of the traffic analysis results for this intersection is provided in **Table 27**.

Under existing traffic conditions, the intersection operates at an acceptable level of service during the weekday morning peak hours with overall v/c ratios of 0.62. The weekday afternoon peak hour has an overall v/c ratio of 0.73.

Under the 2026 future background conditions, with the allowances for specific area developments, while maintaining the existing lane configurations, the intersection operates at an acceptable level of service, during the weekday morning and afternoon peak hours. with overall v/c ratios of 0.66 and 0.81, respectively.



With the addition of site-related traffic under future total traffic conditions, the intersection continues to operate at an acceptable level of service, with v/c ratios for all movements remaining under 1.0, during the weekday morning and afternoon peak hours, for both the 2026 and the 2031 horizon years.

TABLE 27 KERR STREET / SPEERS ROAD CAPACITY ANALYSIS RESULTS

Movement	Existing Traffic		Future Background (2026)		Future Total (2026)		Future Total (2031)	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
EBL	0.08 (0.18)	B (B)	0.09 (0.22)	B (B)	0.09 (0.22)	B (B)	0.20 (0.53)	B (B)
EBTR	0.50 (0.45)	C (C)	0.54 (0.52)	C (C)	0.55 (0.52)	C (C)	0.59 (0.54)	C (C)
WBL	0.51 (0.68)	B (B)	0.55 (0.77)	B (C)	0.56 (0.78)	B (C)	0.59 (0.78)	C (C)
WBT	0.27 (0.45)	B (C)	0.31 (0.51)	C (C)	0.32 (0.51)	C (C)	0.36 (0.57)	C (C)
WBR	0.12 (0.35)	B (C)	0.13 (0.36)	B (C)	0.13 (0.36)	B (C)	0.13 (0.41)	C (C)
NBL	0.33 (0.55)	D (D)	0.34 (0.60)	D (D)	0.34 (0.60)	D (D)	0.36 (0.65)	D (D)
NBT	0.32 (0.45)	D (D)	0.37 (0.43)	D (D)	0.37 (0.44)	D (D)	0.40 (0.50)	D (D)
NBR	0.67 (0.16)	D (D)	0.70 (0.16)	E (D)	0.70 (0.17)	E (D)	0.73 (0.17)	E (D)
SBL	0.70 (0.68)	C (D)	0.72 (0.70)	C (D)	0.73 (0.73)	D (D)	0.77 (0.81)	D (D)
SBTR	0.41 (0.76)	D (D)	0.48 (0.81)	D (D)	0.48 (0.81)	D (D)	0.51 (0.80)	D (D)
Overall	0.62 (0.73)	C (C)	0.66 (0.81)	C (C)	0.66 (0.82)	C (C)	0.70 (0.83)	C (C)

Notes:

1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour)

Based on the foregoing, the traffic generated by the proposed development can be acceptably accommodated at the **Kerr Street / Speers Road** intersection under the existing lane configurations.

9.4.2.2 Speers Road / Cross Avenue

The **Speers Road / Cross Avenue** intersection operates under traffic signal control with a cycle length of 140 seconds, during the weekday morning and afternoon peak hour. The existing cycle lengths were maintained in all analysis scenarios, with minor adjustments to traffic signal phase splits. A summary of traffic analysis results for this intersection is provided in **Table 28**.

Under existing traffic conditions, the intersection operates at an acceptable level of service, during the weekday morning peak hours with overall v/c ratios of 0.39. The weekday afternoon peak hour has an overall v/c ratio of 0.60.

Under future background conditions, with the allowances for specific area developments, the intersection operates at an acceptable level of service, during the weekday morning and afternoon peak hours with overall v/c ratios of 0.40 and 0.65, respectively.



With the addition of site-related traffic under future total traffic conditions, the intersection continues to operate at an acceptable level of service while maintaining the existing lane configuration, with v/c ratios for all movements remaining under 1.0, during the weekday morning and afternoon peak hours, for both the 2026 and the 2031 horizon years.

TABLE 28 SPEERS ROAD / CROSS AVENUE CAPACITY ANALYSIS RESULTS

Movement	Existing Traffic		Future Background (2026)		Future Total (2026)		Future Total (2031)	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
EBL	0.30 (0.60)	A (A)	0.33 (0.65)	A (B)	0.36 (0.64)	A (B)	0.38 (0.64)	A (C)
EBT	0.40 (0.27)	A (A)	0.41 (0.29)	A (A)	0.41 (0.29)	A (A)	0.43 (0.30)	A (A)
WBTR	0.23 (0.48)	A (B)	0.25 (0.55)	A (B)	0.25 (0.58)	A (B)	0.27 (0.63)	A (B)
SBL	0.04 (0.07)	E (E)	0.04 (0.06)	E (E)	0.04 (0.06)	E (E)	0.04 (0.06)	E (E)
SBR	0.08 (0.42)	E (E)	0.09 (0.56)	E (E)	0.09 (0.57)	E (E)	0.09 (0.59)	E (E)
Overall	0.39 (0.60)	A (B)	0.40 (0.65)	B (B)	0.41 (0.65)	B (C)	0.43 (0.65)	B (C)

Notes:

1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour)

Based on the foregoing, the traffic generated by the proposed development can be acceptably accommodated at the **Speers Road / Cross Avenue** intersection. No mitigation measures or improvements are recommended at this intersection.

9.4.2.3 Kerr Street / Shepherd Road

The **Kerr Street / Shepherd Road** intersection operates under traffic signal control with a cycle length of 86 seconds during the weekday morning and afternoon peak hour. The existing cycle lengths were maintained in all analysis scenarios, with minor adjustment to traffic signal phase splits. A summary of traffic analysis results for this intersection is provided in **Table 29**.

Under existing traffic conditions, the intersection operates at an acceptable level of service, during the weekday morning peak hours with overall v/c ratios of 0.43. The weekday afternoon peak hour has an overall v/c ratio of 0.57.

Under the 2026 future background conditions, with the allowances for specific area developments, the intersection operates at an acceptable level of service, during the weekday morning and afternoon peak hours, with overall v/c ratios of 0.48 and 0.61, respectively.

With the addition of site-related traffic under future total traffic conditions, the intersection continues to operate at an acceptable level of service, with v/c ratios for all movements remaining under 1.0, during the weekday morning and afternoon peak hours, for both the 2026 and the 2031 horizon years.



TABLE 29 KERR STREET / SHEPHERD ROAD CAPACITY ANALYSIS RESULTS

Movement	Existing Traffic		Future Background (2026)		Future Total (2026)		Future Total (2031)	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
EBTLR	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	0.23 (0.14)	B (B)
WBLR	0.30 (0.38)	B (B)	0.37 (0.42)	B (B)	0.37 (0.44)	B (B)	-- (--)	-- (--)
WBTLR	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	0.41 (0.51)	B (B)
NBTR	0.18 (0.41)	A (A)	0.20 (0.41)	A (A)	0.20 (0.41)	A (A)	-- (--)	-- (--)
NBTLR	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	0.30 (0.63)	A (A)
SBTL	0.40 (0.56)	A (A)	0.44 (0.61)	A (A)	0.45 (0.62)	A (A)	-- (--)	-- (--)
SBTLR	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	0.48 (0.67)	A (B)
Overall	0.43 (0.57)	A (A)	0.48 (0.61)	A (A)	0.48 (0.62)	A (A)	0.52 (0.68)	A (B)

Notes:

1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour)
2. Blank cells reflect intersection movements that do not exist under that particular scenario.

Based on the foregoing, the traffic generated by the proposed development can be acceptably accommodated at the **Kerr Street / Shepherd Road** intersection. No mitigation measures or improvements are recommended at this intersection.

9.4.2.4 Kerr Street / Stewart Street

The **Kerr Street / Stewart Street** intersection operates under traffic signal control with a cycle length of 75 seconds, during the weekday morning and afternoon peak hour. The existing cycle lengths were maintained in all analysis scenarios, with minor adjustment to traffic signal phase splits. A summary of traffic analysis results for this intersection is provided in **Table 30**.

Under existing traffic conditions, the intersection operates at an acceptable level of service during the weekday morning peak hours with overall v/c ratios of 0.33. The weekday afternoon peak hour has an overall v/c ratio of 0.52.

Under future background conditions, with the allowances for specific area developments, the intersection operates at an acceptable level of service, during the weekday morning and afternoon peak hours with overall v/c ratios of 0.35 and 0.57, respectively.

With the addition of site-related traffic under future total traffic conditions, the intersection continues to operate at an acceptable level of service, with v/c ratios for all movements remaining under 1.0, during the weekday morning and afternoon peak hours, for both the 2026 and the 2031 horizon years.



TABLE 30 KERR STREET / STEWART STREET CAPACITY ANALYSIS RESULTS

Movement	Existing Traffic		Future Background (2026)		Future Total (2026)		Future Total (2031)	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
EBTLR	0.27 (0.29)	C (C)	0.28 (0.29)	C (C)	0.28 (0.29)	C (C)	0.28 (0.29)	C (C)
WBTLR	0.25 (0.15)	C (C)	0.27 (0.15)	C (C)	0.27 (0.15)	C (C)	0.27 (0.15)	C (C)
NBTLR	0.33 (0.32)	A (A)	0.35 (0.35)	A (A)	0.35 (0.35)	A (A)	0.37 (0.37)	A (A)
SBTLR	0.31 (0.55)	A (A)	0.35 (0.61)	A (A)	0.35 (0.61)	A (A)	0.37 (0.63)	A (A)
Overall	0.33 (0.52)	A (A)	0.35 (0.57)	A (A)	0.35 (0.57)	A (A)	0.37 (0.59)	A (A)

Notes:

1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour)

Based on the foregoing, the traffic generated by the proposed development can be acceptably accommodated at the **Kerr Street / Stewart Street** intersection. No mitigation measures or improvements are recommended at this intersection.



9.5 UNSIGNALIZED INTERSECTION ANALYSIS

9.5.1 Scenario #1 – All Planned Improvements in Place by 2026 and 2031

Traffic operations at all unsignalized intersections within the study area are at an acceptable level of service under all scenarios, without any need for road improvements or mitigation measures. The results of the capacity analysis undertaken at the unsignalized intersections are summarized in **Table 31**.

TABLE 31 UNSIGNALIZED INTERSECTIONS CAPACITY ANALYSIS RESULTS

Intersection / Movement	Existing Traffic Conditions		Future Background Traffic (2026)		Future Total Traffic (2026)		Future Total Traffic (2031)	
	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)
St. Augustine Drive / Speers Road								
EBL	A (A)	8.5 (9.6)	A (A)	8.7 (9.8)	A (A)	8.7 (9.8)	A (A)	9.2 (10.0)
EBT	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
EBTR	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
WBT	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
WBTR	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
NBRL	B (B)	12.4 (13.4)	B (B)	12.9 (14.4)	B (B)	12.9 (14.4)	B (C)	13.8 (15.2)
SBTLR	A (D)	0.0 (33.2)	A (E)	0.0 (39.0)	A (E)	0.0 (39.2)	A (E)	0.0 (43.4)
Kerr Street / Wyecroft Road								
EBL	-- (--)	-- (--)	D (E)	30.8 (35.9)	D (E)	31.0 (36.5)	E (E)	38.3 (43.4)
EBR	-- (--)	-- (--)	B (B)	11.6 (12.4)	B (B)	11.6 (12.6)	B (B)	11.9 (13.4)
EBLR	B (D)	14.9 (25.9)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
NBL	A (A)	9.9 (9.5)	B (B)	10.4 (10.0)	B (B)	10.5 (10.0)	B (B)	11.0 (10.4)
NBT	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
SBT	-- (--)	-- (--)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
SBTR	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
Kerr Street / Prince Charles Drive								
EBTLR	C (C)	18.2 (23.6)	C (C)	17.5 (23.4)	C (C)	17.5 (23.5)	C (C)	18.1 (24.2)
WBTLR	B (C)	13.7 (17.9)	B (C)	13.7 (17.7)	B (C)	13.7 (17.8)	B (C)	14.0 (18.2)
NBTLR	A (A)	0.1 (0.2)	A (A)	0.1 (0.2)	A (A)	0.1 (0.2)	A (A)	0.1 (0.2)
SBTLR	A (A)	1.3 (0.6)	A (A)	1.3 (0.6)	A (A)	1.3 (0.6)	A (A)	1.3 (0.6)
Kerr Street / Elmwood Road								
EBLR	C (C)	16.0 (17.6)	C (C)	15.4 (18.3)	C (C)	15.4 (18.4)	C (C)	15.5 (19.0)
NBTL	A (A)	0.1 (0.2)	A (A)	0.1 (0.2)	A (A)	0.1 (0.2)	A (A)	0.1 (0.2)
SBTR	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
Speers Service Road (West Access) / Speers Road								
EBT	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
EBTR	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)



Intersection / Movement	Existing Traffic Conditions		Future Background Traffic (2026)		Future Total Traffic (2026)		Future Total Traffic (2031)	
	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)
WBT	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
WBTL	A (A)	0.0 (0.2)	A (A)	0.0 (0.2)	-- (--)	-- (--)	-- (--)	-- (--)
NBR	-- (--)	-- (--)	-- (--)	-- (--)	A (A)	9.9 (9.3)	A (A)	9.8 (9.3)
NBLR	E (A)	38.4 (9.9)	E (A)	37.8 (9.2)	-- (--)	-- (--)	-- (--)	-- (--)
Speers Service Road (East Access) / Speers Road / 41 Speers Driveway								
EBT	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
EBTR	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
WBTL	A (A)	0.3 (0.4)	A (A)	0.3 (0.4)	A (A)	1.1 (1.0)	A (A)	1.1 (1.0)
WBT	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
NBTLR	C (D)	24.8 (25.8)	C (C)	23.4 (20.4)	E (D)	40.3 (26.1)	E (D)	44.4 (25.5)
SBTLR	A (E)	0.0 (38.4)	A (D)	0.0 (30.4)	A (D)	0.0 (31.1)	A (D)	0.0 (31.5)

Notes:

1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour)
2. Blank cells reflect intersection movements that do not exist under the particular scenario.
3. Red highlighted locations are the critical east and west intersections of the Service Road with Speers Road.

Based on the foregoing, the proposed development can be accommodated on the future transportation network.

9.5.2 Scenario #2 – No Improvements in Place by the 2026 and 2031 Horizon

The results of the capacity analysis undertaken at the unsignalized intersections are summarized in **Table 32**.

Traffic operations at all unsignalized intersections within the study area are at an acceptable level of service under all scenarios, without any need for road improvements or mitigation measures.

It is however noted that the intersection of **Speers Service Road (East Access) / Speers Road**, in the 2031 future total traffic condition, is expected to experience minor delays (approximately 53 seconds) for northbound left-turning vehicles during the morning peak hour. This delay is however deemed acceptable and expected at an unsignalized intersection during peak periods of travel. The delay for northbound left-turning vehicles may also be less due to gaps created by the nearby traffic signal at Kerr Street.



TABLE 32 UNSIGNALIZED INTERSECTIONS CAPACITY ANALYSIS RESULTS

Intersection / Movement	Existing Traffic Conditions		Future Background Traffic (2026)		Future Total Traffic (2026)		Future Total Traffic (2031)	
	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)
St. Augustine Drive / Speers Road								
EBL	A (A)	8.5 (9.6)	A (A)	8.6 (9.8)	A (A)	8.7 (9.8)	A (A)	9.1 (9.9)
EBT	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
EBTR	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
WBT	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
WBTR	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
NBRL	B (B)	12.4 (13.4)	B (B)	12.8 (14.2)	B (B)	12.8 (14.3)	B (C)	13.8 (15.2)
SBTLR	A (D)	0.0 (33.2)	A (E)	0.0 (38.1)	A (E)	0.0 (38.3)	A (E)	0.0 (42.8)
Kerr Street / Wyecroft Road								
EBLR	B (D)	14.9 (25.9)	C (D)	16.0 (32.5)	C (D)	16.1 (33.6)	C (E)	17.3 (45.1)
NBL	A (A)	9.9 (9.5)	B (A)	10.3 (9.9)	B (A)	10.4 (9.9)	B (B)	10.8 (10.3)
NBT	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
SBTR	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
Kerr Street / Prince Charles Drive								
EBTLR	C (C)	18.2 (23.6)	C (D)	19.2 (26.9)	C (D)	19.2 (27.1)	C (D)	20.0 (28.0)
WBTLR	B (C)	13.7 (17.9)	B (C)	14.1 (19.6)	B (C)	14.1 (19.7)	B (C)	14.4 (20.3)
NBTLR	A (A)	0.1 (0.2)	A (A)	0.1 (0.2)	A (A)	0.1 (0.2)	A (A)	0.1 (0.2)
SBTLR	A (A)	1.3 (0.6)	A (A)	1.3 (0.6)	A (A)	1.3 (0.6)	A (A)	1.3 (0.6)
Kerr Street / Elmwood Road								
EBLR	C (C)	16.0 (17.6)	C (C)	17.0 (19.6)	C (C)	17.0 (19.7)	C (C)	16.2 (20.4)
NBTL	A (A)	0.1 (0.2)	A (A)	0.1 (0.2)	A (A)	0.1 (0.2)	A (A)	0.1 (0.2)
SBTR	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
Speers Service Road (West Access) / Speers Road								
EBT	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
EBTR	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
WBTL	A (A)	0.0 (0.2)	A (A)	0.0 (0.2)	-- (--)	-- (--)	-- (--)	-- (--)
WBT	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
NBLR	E (A)	38.4 (9.9)	E (A)	41.0 (9.8)	-- (--)	-- (--)	-- (--)	-- (--)
NBR	-- (--)	-- (--)	-- (--)	-- (--)	B (A)	11.0 (10.0)	B (A)	11.0 (10.0)
Speers Service Road (East Access) / Speers Road / 41 Speers Driveway								
EBT	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
EBTR	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
WBTL	A (A)	0.3 (0.4)	A (A)	0.3 (0.4)	A (A)	1.1 (1.1)	A (A)	1.1 (1.1)
WBT	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)



Intersection / Movement	Existing Traffic Conditions		Future Background Traffic (2026)		Future Total Traffic (2026)		Future Total Traffic (2031)	
	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)
NBTLR	C (D)	24.8 (25.8)	D (C)	26.4 (24.8)	E (D)	47.5 (34.1)	F (D)	52.5 (33.7)
SBTLR	A (E)	0.0 (38.4)	A (E)	0.0 (37.7)	A (E)	0.0 (39.8)	A (E)	0.0 (41.0)

Notes:

1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour)
2. Blank cells reflect intersection movements that do not exist under the particular scenario.



9.6 TRAFFIC SIGNAL ASSESSMENT ON SPEERS ROAD

In order to determine if a new traffic signal is required on Speers Road as a result of the proposed development, a traffic signal warrant analysis was undertaken based on the Ontario Traffic Manual (OTM) Book 12 methodology (Justification 7). As the west access at Speers Service Road/ Speers Road is recommended to become a right-in/ right-out only, the traffic signal warrant assessment was only undertaken for the east Speers Service Road/ Speers Road intersection.

The results of the traffic signal warrant analysis are summarized in **Table 33**, with the relevant excerpts and detailed analysis provided in **Appendix I**.

A traffic signal is not required at the intersection of east Speers Service Road/ Speers Road, as the traffic signal warrants are only met at **31%** compared to the 120% requirement.

TABLE 33 TRAFFIC SIGNAL WARRANTS (2031): SPEERS ROAD/ SPEERS SERVICE ROAD (EAST ACCESS)

Justification	Description	Minimum Requirement 2 Lane Highways [Restricted Flow] 4-legged	Compliance		
			Sectional		Entire % (≥120) ¹
			Base	Actual Traffic Volumes	
Speers Road & Speers Service Road (East Access)					
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	900	1306	145%	31%
	B. Vehicle volume, along minor streets (average hour)	170	26	15%	
2. Delay to Cross Traffic	A. Vehicle volume, major street (average hour)	900	1280	142%	
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)- left + highest through +peds	75	23	31%	

Notes:

- For existing intersections with future peak hour volumes only, the warrant should be met with 120% (as opposed to 100% for an existing intersection with an 8-hour count estimate).
- Average hourly volumes were derived based on the formula presented in the OTM Book 12.
- AHV = (weekday morning peak hour volumes + weekday afternoon peak hour volumes) ÷ 4
- Relevant OTM excerpts are provided in **Appendix I**. Note that there is an error in Table 21 in OTM Book 12 and confirmed by MTO staff. The base volume required in the table above for 2B is 75 and not 170 as noted in Book 12.
- To be conservative, for 2B it was assumed that there would be 20 pedestrians crossing Speers Road in each of the peak hours.



10.0 SAFETY ANALYSIS

10.1 LEFT-TURN LANE ASSESSMENT

Although westbound vehicles turning left into the Speers Service Road from Speers Road is an existing condition and a dedicated left-turn lane is currently not present, the need for a dedicated left-turn lane was considered as part of the safety analysis.

As discussed with Town staff, based on a review of the Town's planned road widening projects, the Town's current design to upgrade/widen the Speers Road/Kerr Street intersection does not include any scope for modifying Speers Road in front of the 50 Speers Road property. As a result, the installation of a two-way left-turn lane would require a road widening, and a two-way left-turn lane on Speers Road cannot be accommodated at this time. In an effort to improve sightlines however, the development proposal now includes a plan to modify the Service Road adjacent to the Site by restricting the west intersection with Speers Road to right-in/ right-out only. Full access is proposed to be maintained at the east Service Road intersection with Speers Road. In order to improve the level of safety, all left turns to/from the Site will therefore be directed to use the east intersection where they can be appropriately accommodated.

The traffic analysis for this study indicates that there is expected to be a future total maximum of 25 westbound vehicles turning left from Speers Road to the east Speers Service Road, during the peak hours of the day. As Speers Road is a 4-lane road with 2 lanes in each direction, it is likely that westbound left-turning vehicles on Speers Road would remain in the median lane while waiting to turn left, while westbound through vehicles would bypass the left-turning vehicle and travel in the curb lane with very little impact to the westbound through traffic. In addition, the capacity analysis results summarized in **Table 32** indicates that the westbound left-turning movement at the intersection of Speers Road / Speers Service Road (East Access) operates at an acceptable level of service under all scenarios, without the need for road improvements or mitigation measures. Based on the results of the capacity analysis, a westbound left-turn lane into the east site driveways is deemed to not be required.



10.2 SIGHT DISTANCE (FROM SPEERS ROAD SERVICE ROAD)

The sight distance for the two existing access points (east and west) for the site from Speers Service Road to Speers Road has been evaluated based on Transportation Association of Canada (TAC) design criteria. As summarized in **Table 34**, both access points meet the minimum sight distance requirements as outlined in the TAC Manual. The relevant sight distance figures are provided in **Appendix J**.

As vehicles exiting with a left turn from the east Speers Service Road onto Speers Road would need to turn across more than two lanes, the TAC manual requires that an additional 0.5 second time gap for a passenger car be added to the calculation, hence the time gap increases from 7.5 to 8.0 seconds in the assessed scenario.

- Posted Speed = 60 km/h
- V major (design speed) = 70 km/h
- Time gap (tg)= 8 seconds

Substituting parameters into equation 9.9.1 of the TAC manual results in the following intersection sight distance (ISD) requirements:

- $ISD = 0.278 V \text{ major} \times tg$
- $ISD = 0.278 \times 70 \times 8$
- $ISD = 155.68 \text{ m} \approx 160 \text{ m}$

TABLE 34 TAC MINIMUM SIGHT DISTANCE REQUIREMENTS

Speers Service Road to Speers Road	Posted Speed Limit	Design Speed Assumption	Intersection Control	TAC Minimum Sight Distance Required (ISD)	Requirements Satisfied
East Access	60 km/h	70 km/h	Case B1 – Left turn from the minor road	160 m	Yes
West Access	60 km/h	70 km/h	Case B2 – Right turn from the minor road	130 m	Yes



10.3 QUEUING ANALYSIS

An analysis of the existing and projected future vehicle queues was undertaken at all signalized intersections in order to confirm that queues would be acceptably accommodated under the study horizon years. The scenarios identified in Section 9.2.3 and noted below, were assessed as part of the queuing study.

1. Grade separation, road widening, intersection improvement, turning lanes, and active transportation infrastructure **in place** by 2026 and 2031 horizon years.
2. Grade separation and associated improvement **deferred** beyond the 2031 horizon year.

The results of the detailed queuing analysis for Scenario 1 are illustrated in **Table 35**.

10.3.1 Scenario #1 Queuing Analysis

10.3.1.1 Kerr Street / Speers Road

Under existing traffic conditions, the average and 95th percentile queues for all turning movements can be comfortably accommodated within the existing storage lengths, during the morning and afternoon peak hours.

Under the 2026 horizon year future background condition, there is a change in lane configuration due to the planned road network improvements. As a result, some of the newly implemented turning movements have proposed storage lengths that minimize delays to through movements. For example, the EBR turning lane (75 metres of storage), reduces EBT queues, during the morning peak hours for the average and 95th percentile queues, from approximately 68 and 99 metres to 54 and 93 metres, respectively.

Under the future total horizon years (2026 and 2031), the proposed storage lengths for left and right-turning movements are the same as the 2026 future background horizon year. The average and 95th percentile queues can all be comfortably accommodated within the proposed storage lengths during the morning and afternoon peak hours.

10.3.1.2 Speers Road / Cross Avenue

Under existing traffic conditions, the average and 95th percentile queues for all turning movements can be comfortably accommodated within the existing storage lengths, during the morning and afternoon peak hours.

Under the 2026 horizon year future background condition, the average and 95th percentile queues for all turning movements can be comfortably accommodated within the proposed storage lengths, during the morning and afternoon peak hours.

Under the future total horizon years (2026 and 2031), the proposed storage lengths for left-turning movements are the same as the 2026 future background horizon year. The average and 95th percentile queues can all be comfortably accommodated within the proposed storage lengths, during the morning and afternoon peak hours.



10.3.1.3 Kerr Street / Shepherd Road

Under existing traffic conditions, no storage is provided for the left and right-turning movements, during the morning and afternoon peak hours.

Under the 2026 horizon year future background condition, there is a change in lane configuration due to the planned road network improvements along both Kerr Street and Shepherd Road. As a result, some of the newly implemented turning movements have proposed storage lengths that minimize delays to through movements. The average and 95th percentile queues can all be comfortably accommodated within the proposed storage lengths, during the morning and afternoon peak hours.

Under the 2031 future total horizon year with the development of the Upper Kerr Village Site, the proposed storage lengths for both the northbound and southbound left and right-turning movements are all 50 metres. Also, the westbound and eastbound left-turning movements has a proposed storage of 30 metres. The average and 95th percentile queues can all be comfortably accommodated within the proposed storage lengths, during the morning and afternoon peak hours.

10.3.1.4 Kerr Street / Stewart Street

Under existing traffic conditions, no storage is provided for the left and right-turning movements, during the morning and afternoon peak hours.

Under the future total horizon years (2026 and 2031), with the implementation of the northbound and southbound dedicated left-turning lanes as part of the planned future upgrades, with a storage length of 20 metres, the average and 95th percentile queues can all be comfortably accommodated at the intersection, during the morning and afternoon peak hours.

The results of the queuing analysis for Scenario 1 indicate that the development proposal is expected to have negligible impacts on intersection queuing in the study area. As a result, there are no safety-related concerns in relation to the development and intersection queuing in the study area.

10.3.2 Scenario #2 Queuing Analysis

The results of the detailed queuing analysis for Scenario 2 are illustrated in **Table 36**.

10.3.2.1 Kerr Street / Speers Road

Under existing traffic conditions, the average and 95th percentile queues for most turning movements can be comfortably accommodated within the existing storage lengths, during the morning and afternoon peak hours, with the exception of the NBR turning movement. The NBR movement has an existing storage length of 45 metres but the 95th percentile queue length is 58 metres, during the morning peak hour.

Under the 2026 horizon year future background condition, the existing lane configuration is maintained and as a result, the 95th percentile queue for the NBR turning movement increases from 58 to 61 metres, during the



morning peak hour. In addition, the 95th percentile queue for the WBL turning movement, during the afternoon peak hour, extends beyond the 75 metres of available storage with a queue length of 89 metres.

Under the future total horizon years (2026 and 2031), the existing storage lengths are maintained and the NBR turning movement still extends beyond the 45 metres storage in the morning peak hour to 61 metres in the 2026 horizon year and 65 metres in the 2031 horizon year. The WBL turning movement also extend beyond the 75 metres storage in the afternoon peak hour to approximately 93 metres in the 2026 horizon year and 96 metres in the 2031 horizon year. It is noted that these queuing concerns are expected to be present in the future background conditions, even without development of the site and as a result, the site traffic has a negligible impact on the queues in the future.

10.3.2.2 Speers Road / Cross Avenue

Under existing traffic conditions, 2026 horizon year future background and future total horizon years (2026 and 2031), the average and 95th percentile queues for all turning movements can be comfortably accommodated within the existing storage lengths, during the morning and afternoon peak hours. In addition, there are no queuing concerns for any of the through movements at this intersection.

10.3.2.3 Kerr Street / Shepherd Road

Under existing and all future traffic conditions, no storage is provided for the left and right-turning movements during the morning and afternoon peak hours. However, it is noted that there are no queuing concerns at this intersection.

10.3.2.4 Kerr Street / Stewart Street

Under existing and all future traffic conditions, no storage is provided for the left and right-turning movements, during the morning and afternoon peak hours.

Under existing and all future traffic conditions, there may be some queuing concerns related to the southbound movement during the afternoon peak period. However, this is only expected to occur during the busiest time of the peak period i.e. up to approximately 3 times per cycle. It is important to note that the impact of the site traffic on this queue is negligible.

The results of the queuing analysis for Scenario 2 indicate that the development proposal is expected to have negligible impacts on intersection queuing in the study area. As a result, there are no safety-related concerns in relation to the development and intersection queuing in the study area.



TABLE 35 QUEUING ANALYSIS SUMMARY – SCENARIO 1

Movement	Existing			Future Background 2026			Future Total 2026		Future Total 2031	
	50th Queue (metres)	95th Queue (metres)	Existing Storage (metres)	50th Queue (metres)	95th Queue (metres)	Proposed Storage (metres)	50th Queue (metres)	95th Queue (metres)	50th Queue (metres)	95th Queue (metres)
Kerr Street / Speers Road										
EBL	4.0 (6.4)	10.8 (13.6)	105 (105)	3.3 (6.5)	10.2 (14.1)	105 (105)	3.3 (6.5)	10.3 (14.1)	7.8 (16.3)	19.7 (30.7)
EBT	67.6 (62.0)	99.2 (76.4)	-- (--)	54.1 (53.6)	92.8 (69.0)	-- (--)	54.8 (53.8)	93.6 (69.0)	59.7 (54.2)	100.2 (71.6)
EBR	-- (--)	-- (--)	-- (--)	0.0 (0.0)	9.0 (12.1)	75 (75)	0.0 (0.0)	9.0 (12.1)	0.0 (0.0)	10.1 (12.2)
WBL	22.4 (35.3)	41.7 (#59.6)	75 (75)	19.1 (34.9)	40.7 (57.1)	75 (75)	19.2 (35.5)	41.0 (58.1)	19.3 (33.9)	41.7 (#60.7)
WBT	36.7 (66.5)	56.6 (90.5)	-- (--)	35.8 (71.2)	60.7 (99.5)	-- (--)	36.8 (71.1)	62.1 (99.5)	40.8 (80.0)	71.1 (113.8)
WBR	0.0 (0.0)	14.9 (20.4)	100(100)	0.0 (0.0)	14.7 (20.4)	100(100)	0.0 (0.0)	14.8 (20.4)	0.0 (8.3)	15.6 (39.6)
NBL	14.3 (23.0)	22.1 (36.2)	50 (50)	17.2 (23.8)	24.2 (36.5)	50 (50)	17.1 (23.8)	24.1 (36.5)	18.1 (26.4)	24.8 (39.0)
NBT	20.8 (31.3)	32.8 (46.5)	-- (--)	25.4 (33.3)	37.6 (51.5)	-- (--)	25.4 (33.6)	37.5 (51.5)	27.9 (39.5)	40.2 (57.5)
NBR	26.7 (0.0)	58.0 (19.2)	45 (45)	31.8 (0.0)	61.8 (19.8)	45 (45)	32.4 (0.0)	62.2 (20.1)	35.8 (0.0)	64.8 (20.1)
SBL	61.6 (48.4)	77.1 (68.8)	-- (--)	32.6 (24.6)	35.9 (32.6)	80 (80)	33.1 (26.1)	36.1 (34.3)	34.4 (27.8)	37.1 (35.3)
SBT	36.0 (65.2)	50.9 (90.5)	-- (--)	36.0 (66.8)	47.0 (89.2)	-- (--)	35.9 (66.8)	46.7 (89.2)	41.9 (69.3)	52.4 (92.7)
SBR	-- (--)	-- (--)	-- (--)	0.0 (0.0)	9.9 (7.2)	75 (75)	0.0 (0.0)	9.9 (7.2)	0.0 (0.0)	8.8 (1.6)
Speers Road / Cross Avenue										
EBL	7.3 (9.1)	11.7 (19.5)	80 (80)	7.9 (12.3)	12.9 (46.1)	80 (80)	8.8 (17.8)	14.2 (53.2)	8.8 (27.2)	14.2 (63.3)
EBT	32.9 (18.9)	40.9 (33.0)	-- (--)	34.6 (23.0)	43.9 (39.7)	-- (--)	35.0 (23.4)	44.4 (40.2)	37.7 (25.4)	47.7 (43.2)
WBT	25.0 (66.3)	34.1 (113.8)	-- (--)	27.1 (92.0)	37.4 (145.1)	-- (--)	28.0 (97.9)	38.5 (150.2)	29.9 (113.7)	41.0 (157.3)
SBL	1.3 (2.7)	5.8 (8.1)	45 (45)	1.3 (2.6)	5.8 (7.8)	45 (45)	1.3 (2.6)	5.8 (7.8)	1.3 (2.6)	5.8 (7.8)
SBR	0.0 (10.3)	13.9 (27.7)	-- (--)	0.0 (17.8)	14.3 (36.6)	-- (--)	0.0 (18.1)	14.3 (36.9)	0.0 (20.0)	14.3 (38.8)
Kerr Street / Shepherd Road										
EBL	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	6.4 (4.1)	17.9 (14.3)
EBT	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	1.1 (0.5)	9.8 (8.9)
WBL	4.9 (7.6)	18.8 (27.7)	-- (--)	9.7 (12.4)	29.3 (34.0)	-- (--)	9.7 (13.3)	29.3 (35.6)	7.8 (9.7)	21.2 (26.7)
WBT	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	0.4 (0.8)	11.1 (13.0)
NBT	4.9 (13.6)	10.0 (28.5)	-- (--)	8.5 (21.6)	17.8 (42.6)	-- (--)	8.5 (22.2)	17.8 (43.7)	13.1 (31.6)	24.8 (53.7)
NBR	-- (--)	-- (--)	-- (--)	0.0 (0.0)	6.0 (9.2)	-- (--)	0.0 (0.0)	6.0 (9.3)	0.0 (0.0)	3.2 (9.8)
NBL	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	5.2 (12.6)	15.4 (31.7)
SBL	-- (--)	-- (--)	-- (--)	3.0 (5.7)	9.0 (15.8)	-- (--)	3.0 (5.8)	9.0 (16.2)	5.7 (10.2)	14.2 (23.2)
SBT	11.8 (14.6)	21.2 (32.1)	-- (--)	10.1 (10.7)	20.7 (22.9)	-- (--)	10.2 (11.2)	20.9 (24.0)	19.3 (19.5)	33.5 (34.8)
SBR	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	0.0 (0.0)	0.2 (4.0)



Movement	Existing			Future Background 2026			Future Total 2026		Future Total 2031	
	50th Queue (metres)	95th Queue (metres)	Existing Storage (metres)	50th Queue (metres)	95th Queue (metres)	Proposed Storage (metres)	50th Queue (metres)	95th Queue (metres)	50th Queue (metres)	95th Queue (metres)
Kerr Street / Stewart Street										
EBT	8.5 (8.5)	15.7 (16.4)	-- (--)	8.5 (8.5)	15.7 (16.4)	-- (--)	8.5 (8.5)	15.7 (16.4)	8.5 (8.5)	15.7 (16.4)
WBT	7.0 (3.4)	17.1 (13.0)	-- (--)	7.8 (3.4)	18.1 (13.0)	-- (--)	7.8 (3.4)	18.1 (13.0)	7.8 (3.4)	18.1 (13.0)
NBL	-- (--)	-- (--)	-- (--)	0.3 (0.6)	2.2 (3.8)	20 (20)	0.3 (0.6)	2.2 (3.8)	0.3 (0.6)	2.2 (3.8)
NBT	16.5 (15.8)	49.5 (47.3)	-- (--)	28.4 (27.0)	72.1 (69.7)	-- (--)	28.4 (27.5)	72.1 (70.8)	30.2 (29.9)	76.6 (76.5)
SBL	-- (--)	-- (--)	-- (--)	1.2 (1.6)	6.0 (7.7)	20 (20)	1.2 (1.6)	6.0 (7.7)	1.2 (1.6)	6.0 (7.7)
SBT	13.8 (31.1)	42.9 (93.8)	-- (--)	13.5 (31.1)	41.5 (91.8)	-- (--)	13.5 (31.4)	41.5 (92.8)	15.2 (33.1)	46.0 (97.7)

Notes:

1. xx (xx) AM peak hour (PM peak hour)
2. All queues and storage lengths are in metres.
3. Blank cells reflect intersection movements that do not exist under the particular scenario.



TABLE 36 QUEUEING ANALYSIS SUMMARY – SCENARIO 2

Movement	Existing			Future Background 2026			Future Total 2026		Future Total 2031	
	50th Queue (metres)	95th Queue (metres)	Existing Storage (metres)	50th Queue (metres)	95th Queue (metres)	Proposed Storage (metres)	50th Queue (metres)	95th Queue (metres)	50th Queue (metres)	95th Queue (metres)
Kerr Street / Speers Road										
EBL	4.0 (6.4)	10.8 (13.6)	105 (105)	4.0 (7.1)	11.1 (14.9)	105 (105)	4.0 (7.1)	11.2 (14.9)	9.1 (17.2)	21.1 (32.3)
EBT	67.6 (62.0)	99.2 (76.4)	-- (--)	74.6 (71.4)	107.2 (85.5)	-- (--)	75.7 (72.1)	107.8 (86.3)	80.3 (70.9)	116.1 (90.0)
WBL	22.4 (35.3)	41.7 (#59.6)	75 (75)	23.3 (37.9)	44.3 (#89.0)	75 (75)	23.5 (38.6)	44.4 (#92.6)	22.8 (35.9)	44.6 (#95.6)
WBT	36.7 (66.5)	56.6 (90.5)	-- (--)	41.8 (75.9)	65.1 (103.5)	-- (--)	43.1 (75.9)	66.4 (103.5)	46.5 (83.5)	72.5 (113.8)
WBR	0.0 (0.0)	14.9 (20.4)	100(100)	0.0 (0.0)	15.8 (21.7)	100(100)	0.0 (0.0)	15.8 (21.7)	0.0 (8.6)	15.7 (39.6)
NBL	14.3 (23.0)	22.1 (36.2)	50 (50)	15.0 (22.6)	22.2 (35.1)	50 (50)	14.9 (22.6)	22.2 (35.1)	16.2 (25.6)	23.1 (37.6)
NBT	20.8 (31.3)	32.8 (46.5)	-- (--)	25.4 (33.9)	37.7 (50.0)	-- (--)	25.4 (33.9)	37.6 (50.0)	27.9 (38.4)	40.5 (55.9)
NBR	26.7 (0.0)	58.0 (19.2)	45 (45)	31.3 (0.0)	61.3 (19.1)	45 (45)	31.8 (0.0)	61.8 (19.4)	35.2 (0.0)	64.8 (19.4)
SBL	61.6 (48.4)	77.1 (68.8)	-- (--)	62.5 (49.7)	75.7 (69.7)	-- (--)	63.3 (52.9)	76.7 (73.7)	68.2 (57.9)	80.0 (76.3)
SBT	36.0 (65.2)	50.9 (90.5)	-- (--)	44.8 (78.7)	59.5 (106.1)	-- (--)	44.6 (78.7)	59.3 (106.1)	50.8 (77.1)	65.3 (102.8)
Speers Road / Cross Avenue										
EBL	7.3 (9.1)	11.7 (19.5)	80 (80)	7.9 (12.3)	12.9 (46.1)	80 (80)	8.8 (17.8)	14.2 (53.2)	8.8 (27.2)	14.2 (63.3)
EBT	32.9 (18.9)	40.9 (33.0)	-- (--)	34.6 (23.0)	43.9 (39.7)	-- (--)	35.0 (23.4)	44.4 (40.2)	37.7 (25.4)	47.7 (43.2)
WBT	25.0 (66.3)	34.1 (113.8)	-- (--)	27.1 (92.0)	37.4 (145.1)	-- (--)	28.0 (97.9)	38.5 (150.2)	29.9 (113.7)	41.0 (157.3)
SBL	1.3 (2.7)	5.8 (8.1)	45 (45)	1.3 (2.6)	5.8 (7.8)	45 (45)	1.3 (2.6)	5.8 (7.8)	1.3 (2.6)	5.8 (7.8)
SBR	0.0 (10.3)	13.9 (27.7)	-- (--)	0.0 (17.8)	14.3 (36.6)	-- (--)	0.0 (18.1)	14.3 (36.9)	0.0 (20.0)	14.3 (38.8)
Kerr Street / Shepherd Road										
EBT	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	3.9 (2.9)	13.6 (14.9)
WBL	4.9 (7.6)	18.8 (27.7)	-- (--)	6.5 (9.4)	22.2 (33.5)	-- (--)	6.5 (10.3)	22.2 (35.7)	-- (--)	-- (--)
WBT	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	6.6 (12.4)	23.0 (45.1)
NBT	4.9 (13.6)	10.0 (28.5)	-- (--)	5.4 (14.4)	11.6 (32.3)	-- (--)	5.4 (15.1)	11.6 (33.5)	7.0 (23.5)	16.1 (55.4)
SBT	11.8 (14.6)	21.2 (32.1)	-- (--)	12.8 (17.1)	24.7 (40.2)	-- (--)	13.0 (17.9)	25.0 (42.1)	13.8 (23.0)	28.9 (55.6)
Kerr Street / Stewart Street										
EBT	8.5 (8.5)	15.7 (16.4)	-- (--)	8.5 (8.5)	15.7 (16.4)	-- (--)	8.5 (8.5)	15.7 (16.4)	8.5 (8.5)	15.7 (16.4)
WBT	7.0 (3.4)	17.1 (13.0)	-- (--)	7.8 (3.4)	18.1 (13.0)	-- (--)	7.8 (3.4)	18.1 (13.0)	7.8 (3.4)	18.1 (13.0)
NBT	16.5 (15.8)	49.5 (47.3)	-- (--)	17.9 (17.4)	53.2 (52.1)	-- (--)	17.9 (17.8)	53.2 (52.9)	19.0 (19.2)	56.6 (56.9)
SBT	13.8 (31.1)	42.9 (93.8)	-- (--)	16.1 (37.5)	49.2 (113.6)	-- (--)	16.1 (38.0)	49.2 (115.3)	17.8 (40.1)	54.3 (122.1)

Notes:

1. xx (xx) AM peak hour (PM peak hour)
2. All queues and storage lengths are in metres. 3. Blank cells reflect intersection movements that do not exist under that scenario.



11.0 CONCLUSIONS AND RECOMMENDATIONS

- The development proposal includes the demolition of the existing residential building and the construction of a new residential building with 330 purpose-built residential rental units. It is expected that site will most likely be build-out by 2027.
- Site access is proposed with a new driveway that connects to the existing Service Road at the front of the building, with 2 existing access points along the Service Road at Speers Road. In order to improve the level of safety for left-turning vehicles travelling in/out of the Service Road at Speers Road, the updated site plan includes modifications to the west Service Road intersection with Speers Road that restricts movements to right-in/ right-out only. An unsignalized access with full movements permitted, would be maintained at the east intersection of the Service Road with Speers Road. The level of safety related to left-turning vehicle movements from the site and from the neighbouring 30 and 80 Speers Road properties, would be improved by ensuring that all left turns occur at the east Service Road intersection on Speers Road, which has the optimal geometry to accommodate left turns.
- Vehicle parking for the site is to be provided within a new 3-level below-grade parking facility. One car-share space will be provided at-grade.
- Since the first submission, changes to the proposed parking supply have been made. The primary change to the proposed parking strategy is that separate parking rates are proposed for resident parking and dedicated visitor parking. The updated application of the Town's Zoning By-law 2014-014 requires a minimum of 270 resident parking spaces (0.82 spaces/unit) and a minimum resident visitor supply of 82 spaces (0.25 spaces/unit). The proposed resident parking supply of 280 spaces (0.85 spaces/unit) exceeds the minimum Zoning By-law requirements by 10 spaces. The proposed resident visitor parking supply of 50 spaces (0.15 spaces/unit) is 32 spaces less than required by the Zoning By-law. The proposed parking supply is appropriated based on several factors such as the area transportation context, the proximity of the Oakville GO station (only 750 m from the site), consideration for Transportation Demand Management, parking demand surveys and recent parking approvals.
- Application of the minimum bicycle parking requirements results in a requirement for 330 bicycle parking spaces, including 248 long-term spaces and 82 visitor spaces. The bicycle parking supply includes a total of 330 spaces and meets the requirements of the Zoning By-law.
- A total of one loading space is proposed at-grade to accommodate the servicing needs of the residential development. The proposed loading facilities are appropriate will meet the practical needs of the site.
- The Transportation Demand Management (TDM) Plan strives to reduce automobile use through an on-going strategy that supports and promotes the use of non-auto transportation modes. Proposed TDM strategies include a reduced parking supply with "unbundled" parking, active transportation facilities (pedestrian connection, bike parking and bike repair station) and travel mode information



packages. The TDM Plan has also been updated to include the provision of information to tenants to better incentivize transit use and one at-grade car-share space near the main entrance. In addition, the developer has committed to considering that the cost of renting a monthly vehicle parking pass in the building could be equal to, or greater than, the cost of a monthly transit pass.

- The TTS travel data demonstrates that the site study area has an auto driver mode share in the order of 57% for morning outbound and 64% for afternoon inbound home-based trips, during the peak travel periods. Non-auto trips (i.e. transit, walking and cycling) account for approximately 29% of all home-based trips made in the morning outbound and 28% in the afternoon inbound, during the peak travel periods. The proposed development is anticipated to generate in the order of **80 and 95 two-way vehicle trips**, during the weekday morning and afternoon peak hours, respectively. In consideration of the existing trips generated by the site, the development is forecasted to have a net impact of approximately **60 two-way vehicle trips**, during both the weekday morning and afternoon peak hours.
- The traffic operations analysis was undertaken during the weekday morning and afternoon street peak hours for existing conditions and the horizons of 2026 and 2031. As per the Town's request, the following two scenarios were considered as part of the updated traffic analysis:
 - Grade separation, road widening, intersection improvement, turning lanes, and active transportation infrastructure **in place** by 2026 and 2031 horizon years.
 - Grade separation and associated improvement **deferred** beyond the 2031 horizon year.
- As per the findings of the updated analysis, it was determined that the impacts of the site are modest and can be accommodated in both future scenarios. The future grade separation and improvements to Kerr Street are not required to accommodate the site.
- It was noted that the intersection of Speers Service Road (East Access) / Speers Road, in the 2031 future total traffic condition, is expected to experience minor delays (approximately 53 seconds) for northbound left-turning vehicles during the morning peak hour. This delay is however deemed acceptable and expected in an urban environment at an unsignalized intersection during peak periods of travel. The delay for northbound left-turning vehicles may also be less due to gaps created by the nearby traffic signal at Kerr Street.
- The traffic analysis for this study indicates that there are expected to be a future total maximum of 25 new westbound left-turning vehicles from Speers Road to the Service Road, at the east access point to the site, during the peak hours of the day. Based on the results of the capacity analysis, a westbound left-turn lane into the east site driveways is deemed to not be required
- The sight distance for the two existing access points from Speers Service Road to Speers Road was evaluated based on Transportation Association of Canada (TAC) design criteria and confirmed that the access points meet the minimum sight distance requirements.
- An analysis of the existing and projected future vehicle queues was undertaken at all signalized intersections in order to confirm that queues would be acceptably accommodated under the study horizon years. The results of the queuing analysis indicate that the development proposal is



expected to have negligible impacts on intersection queuing in the study area. As a result, there are no safety-related concerns in relation to the development and intersection queuing in the study area.

Based on the foregoing, the proposed development can be acceptably accommodated on the existing and future transportation network.



Appendix A

Terms of Reference



Memorandum

TO:

Syed Rizvi
Transportation Engineer
Town of Oakville
Email: syed.rizvi@oakville.ca

FROM:
Deanna Green, P.Eng.

PROJECT:
Proposed Residential
Redevelopment

DATE:
November 23, 2021

**SUBJECT: Traffic Impact Study Terms of Reference - 50 Speers Road, Town of Oakville,
Proposed Residential Redevelopment**

1.0 INTRODUCTION

BA Group has been retained by Helberg Properties Limited to provide transportation consulting services related to the proposed redevelopment of a site (herein referred to as “the site”) municipally known as 50 Speers Road, in the Town of Oakville (“the Town”), in the Region of Halton.

This letter outlines the proposed terms of reference for the Traffic Impact Study (TIS) that is being prepared as part of the **Zoning By-law Amendment (ZBA)** application being submitted to the Town.

The redevelopment proposal includes the demolition of an existing 7-storey residential building with 59 residential units and the construction of a new residential building with approximately 334 residential units. A circular driveway is proposed at the front of the building with 2 access points at Speers Road. Parking is to be provided in a new 3-level below-grade parking facility. The site will most likely be build-out by early 2025.

2.0 PROPOSED SCOPE OF WORK

The traffic impact study will be completed in accordance with Halton Region’s Transportation Impact Study Guidelines as outlined in the following sections.

2.1 DESCRIPTION OF THE PROPOSAL & STUDY AREA

The Transportation Impact Study will provide a full description of the proposed redevelopment and will include elements such as:

- Municipal address;
- Existing land uses or permitted use provisions in an Official Plan, Official Plan Amendments, Zoning By-law etc.;
- Proposed land uses and relevant planning regulations to be used in the study;
- Total building size and building location;
- Floor space including a summary of each type of use/number of residential units;
- Expected date of occupancy;
- Near-by intersections and accesses to adjacent developments and those on the opposite side of the road including type of traffic control;
- Proposed access points and type of access (full movement, right-in-right-out, turning movement restrictions, etc.);
- Nearby transit facilities/stops;
- Near-by Active Transportation Facilities – sidewalks, multi-use trails, bike lanes, etc.,

The study area and traffic analysis will include the following intersections:

Signalized Intersections

- Speers Road & Kerr Street
- Speers Road & Cross Avenue
- Speers Road & Sheppard Drive/ Queen Mary Drive
- Stewart Street & Kerr Street

Unsignalized Intersections

- Speers Road & St. Augustine Drive
- Kerr Street & Wycroft Road
- Prince Charles Drive & Kerr Street
- Elmwood Road & Kerr Street
- Site Access 1 & Speers Road (and internal driveways)
- Site Access 2 & Speers Road (and internal driveways)



2.2 TRANSPORTATION CONTEXT

A description of the existing transportation system in the study area, will identify relevant information, such as the following:

- All adjacent and nearby roads, indicating the number of lanes, and posted speed;
- All adjacent/across and affected intersections/access, indicating type of control, access type, lane configurations, lane widths, and any turning or similar restrictions;
- If appropriate, on-street parking spaces/standing/stopping restrictions in the vicinity of the site and those which would affect the operation of key intersections being analyzed;
- Transit routes and stops;
- Heavy vehicle prohibitions and restrictions;
- All pedestrian and cyclist routes; and
- Other transportation facilities as appropriate.

Potential future transportation improvements that are currently being considered that may facilitate the traffic demand generated by the site will be identified. These improvements will be described to a level of detail sufficient to assess implications for travel to/from the site. In each case, the status and expected date of implementation will be identified.

2.3 PARKING & LOADING CONTEXT

2.3.1.1 Parking

The requirements of the prevailing Town Zoning By-law will be reviewed for both motor vehicles and bicycles in order to confirm the parking needs of the proposed redevelopment. If reduced parking rates are proposed, appropriate proxy data will be provided along with justification for any reductions.

2.3.1.2 Loading

The requirements of the prevailing Town Zoning By-law will be reviewed to confirm the redevelopment's loading supply requirements. An appropriate loading facility supply for site will be provided.

2.4 TRANSPORTATION DEMAND MANAGEMENT (TDM)

The TDM Plan will be included with the TIS and will include a wide variety of initiatives aimed at reducing the amount of travel by single occupant vehicles to achieve a more sustainable travel mode share, particularly during the peak travel hours of the day.

The TDM Plan will consider initiatives such as but not limited to the following:



- Promotion and support for reduced single occupant vehicle use through carpool programs;
- Promotion of transit;
- Consideration of bicycle/pedestrian facilities and connectivity;
- Information for residents regarding sustainable travel options;
- Potential for a reduced parking supply.

2.5 HORIZON YEAR AND TIME PERIODS FOR ANALYSIS

As the site will likely be build-out by 2025, it is proposed that the traffic analysis includes the following scenarios:

- Existing conditions (2022);
- Future background conditions (2025) – with corridor growth and area background development traffic;
- Future total conditions (2025) – at build-out of site and inclusive of site generated traffic;
- Future total conditions (2030) – 5-years beyond build-out with site generated traffic.

The analysis will be completed for both the AM and PM peak periods of the day, during a typical weekday.

2.6 TRAFFIC ANALYSIS

2.6.1 Existing Traffic Conditions

The traffic analysis will include a representative picture of the existing transportation conditions with exhibits that show the existing traffic volumes and turning movements for all modes of transportation for roadways and intersections in the study area including pedestrian/cyclist volumes and heavy truck movements.

All traffic data collection undertaken will include pedestrians, cyclists and motor vehicles on a typical weekday, during typical morning and afternoon peak periods. BA Group will work with the Town to obtain historical counts and supplement available data with new traffic counts to be completed by Spectrum, on behalf of BA Group. Traffic counts more than 2 years old will be updated if possible to ensure that they reflect current traffic levels.

Given the current COVID-19 conditions, it is recognized that 2020 & 2021 traffic counts may not be representative. For this reason, 2020 & 2021 traffic counts will be calibrated and balanced utilizing traffic counts from pre-COVID conditions. The analysis will utilize conservative allowances for pre-COVID existing conditions.

2.6.2 Background Traffic

2.6.2.1 Corridor Growth

The background traffic growth rate in traffic along corridors in the study area, will be established in consultation with Town staff.



2.6.2.2 Background Developments

All significant developments under construction, approved, or in the approval process within the study area and are likely to occur by the specific horizon years will be identified and recognized in the study. The land-use type and magnitude of the probable future developments in the horizon years will be identified through consultation with Town staff.

2.6.2.3 Transportation Network Improvements

Changes to the present or planned transportation network will be determined from the approved Town capital improvement programs. A realistic assessment of timing and certainty will be made. The impacts of the transportation system changes will be identified.

2.6.2.4 Transit/HOV Considerations

The TIS will evaluate the impacts of site generated transit demand for the relevant time periods and scenarios on all transit services and transit stops/stations/terminals where ridership will be increased by 5% or more by site generated transit demand.

For HOV analysis, the lane analysis must use a lane utilization factor of 0.80 for the assumption that 20% is assumed as the HOV lane usage.

2.6.3 Estimation of Travel Demand

2.6.3.1 Trip Generation

Traffic volumes expected to be generated by the site will be forecast using the latest edition of the ITE Trip Generation Manual, unless local & more reliable trip generation data is available.

Trip generation parameters will be selected using the principles as described in Chapter 3 of the ITE Trip Generation Handbook. The estimation of traffic volumes generated by the site will be based on the full build-out of the proposed residential redevelopment.

All trip generation assumptions and adjustments assumed in the calculation of "new" vehicle trips will be documented and justified in terms of previous research or proxy surveys.

2.6.3.2 Trip Distribution

All trip distribution assumptions will be documented and justified. Due consideration will be given to potential differences in trip distribution patterns associated with different time periods.

2.6.3.3 Trip Assignments

Traffic assignments will consider logical routings, available and projected roadway capacities and travel times. Traffic assignments will be estimated using "hand assignment" based on knowledge of the proposed/future road network in the study area.



2.6.3.4 Summary of Traffic Demand Estimates

Traffic volume figures will be provided that illustrate the assignment of all site-generated traffic volumes and pass-by volumes (if applicable) separately to the local road network, as well as to the individual site access locations by direction and by turning movement where required.

For both the AM and PM peak period, the traffic volumes figures will summarize:

- Existing Conditions: existing traffic/transit volumes;
- Future Background: existing plus background growth for each horizon year; and
- Future Total: existing plus background growth plus site generated volumes for each horizon year.

A summary of the future traffic demands (each combination of horizon year and peak period for both site generated and total future traffic conditions) will be provided in the figures. Pass-by traffic assumptions will be clearly identified and illustrated on the figures.

2.6.3.5 Evaluation of Impacts of Site Traffic

The evaluation of the impacts of site traffic will be undertaken for both the AM and PM Peak of each horizon year. The existing volumes, existing plus background growth and existing plus background growth plus site-generated traffic by direction and by turning movement will be included, as well as the scenarios with and without any relevant major transportation system improvements.

2.6.4 Capacity Analysis

A capacity analysis at the study intersections will assess the operations of individual intersections and movements expected to be impacted by the proposed redevelopment. The evaluation of signalized and unsignalized intersections impacted by site traffic volumes will be provided in a tabular format. The objective will be to maintain existing levels of service as best as possible.

The intersection capacity analysis will be completed using Synchro Version 11 and a combination of Highway Capacity Manual (HCM) 2000 and HCM 6 methodologies. A saturation flow rate of 1,900 vehicles per hour will be utilized in the analysis.

The analysis will include the mitigation of impacts to signalized intersection operations where:

- Volume/capacity (v/c) ratios for overall intersection operations, through movements, or shared through/turning movements increased to 0.85 or above;
- V/C ratios for exclusive movements increased to 0.95 or above; or
- Queues for an individual movement are projected to exceed available turning lane storage.

The analysis will also include mitigation at unsignalized intersections where:

- Level of service (LOS), based on average delay per vehicle, on individual movements exceeds LOS "D", or
- The estimated 95th percentile queue length for an individual movement exceeds the available queue storage.



Town staff will be contacted to obtain current traffic signal timings at existing signalized intersections in the study area. All proposed adjustments to traffic signal timings, phasing and cycle lengths will be evaluated in terms of pedestrian crossing time, effect on queue lengths, adequacy of existing storage and effects on the existing traffic signal co-ordination.

2.6.5 Safety Analysis

Potential safety or operational issues associated with the following, as applicable, will be identified:

- Weaving;
- Merging;
- Transit operational conflicts
- Corner clearances;
- Sight distances;
- Vehicle-pedestrian conflicts;
- Traffic infiltration;
- Access conflicts;
- Cyclist movements;
- Heavy truck movement conflicts;
- Queuing

2.6.6 Collision Analysis

If requested by the Town, if there is a collision history at any of the study area intersections that could be impacted by site generated traffic, a request to the Town will be made to obtain the relevant collision data. The collision data will be reviewed and assessed, with respect to the impact of the proposed redevelopment.

2.6.7 Site Access and Circulation

All proposed site access points on Town roads will be evaluated in terms of capacity, safety and sight distance & adequacy of queue storage capacity. This evaluation will be similar in scope to that for the signalized and unsignalized intersections described previously.

Proposed access points will be evaluated with respect to existing access points and intersections, on-street weaving problems, need for acceleration or deceleration lanes and pedestrian and cycling safety.

On-site parking and circulation systems will be evaluated to demonstrate appropriate clear throat distances and avoid any possible queuing onto Town roads.

Sight lines will be evaluated based on the Transportation Association of Canada (TAC Manual).



Proposed truck/courier loading facilities and access to these facilities will be evaluated to ensure that they are adequately sized, designed and provided with suitable access so that they will not adversely affect traffic and transit operations on Town roads.

Any required turning or other restrictions will be identified.

2.6.8 Transportation System Mitigation Measures

2.6.8.1 Required Roadway Improvements

If any physical and operational road network deficiencies are identified in the TIS, solutions will be provided that are feasible and economic to implement.

Functional design plans will be provided for any recommended physical improvements.

2.6.8.2 Traffic Signal Improvements

Any traffic signal operational deficiencies that are identified in the TIS will be addressed and solutions will be provided that are feasible to implement.

2.6.8.3 Preliminary Cost Estimate

A preliminary cost estimate will be provided for all recommended infrastructure improvements.

2.7 RECOMMENDATIONS

A summary of the key findings with respect to the transportation impact of the proposed redevelopment will be presented along with a summary of the recommended improvements if necessary.

Any recommendations for improvements will consider the following:

- Timing of short-range and long-range network improvements that are already planned and scheduled;
- Expected time schedule of adjacent developments;
- Logical sequencing of various improvements or segments;
- Right-of-way needs and availability of additional right-of-way within the appropriate time frames;



2.8 DOCUMENTATION AND REPORTING

The structure and format of the TIS will adhere to the scope of work outlined in this document and include the following:

- Executive Summary
- Site/Development Description (Site plan to be provided);
- Study Area (Map identifying the study area and site to be provided);
- Parking and Loading Context
- Transportation Demand Management (TDM) Plan
- Existing Conditions (Exhibit to be provided);
- Analysis Periods;
- Background Traffic Demand – Existing and Future Background (Exhibits to be provided);
- Site Generated Traffic (Exhibits to be provided);
- Level of Service Analysis;
- Total Traffic Demand – Future Background plus Site Generated Traffic (Exhibits to be provided);
- Improvement Alternatives Required to Mitigate Traffic Impacts
- Traffic Impacts for Future Background and Total Traffic with and without mitigation measures (Tabular summaries to be provided);
- Access Considerations; and
- Recommendations.

The TIS will include a main document, supplemented by a technical appendices containing detailed analysis worksheets, traffic counts data, traffic signal timings and other data as required.



Appendix B

Reduced Scale Architectural Drawings



BDP. Quadrangle

Quadrangle Architects Limited
The Well, 8 Spadina Avenue, Suite 2100, Toronto, ON M5V 0S8
t 416 598 1240 www.bdpquadrangle.com

50 Speers Road

Oakville, ON

for
Helberg Properties Limited

Project No. 20023
Date 2024-02-23
Issued for Issued for OPA/ZBLA Resubmission v2



ARCHITECTURAL DRAWINGS

LANDSCAPE ARCHITECT

MacNaughton Hermesen
Britton Clarkson Planning
Limited
7050 Weston Rd.
Woodbridge ON L4L 8G7
905-851-7479

TRANSPORTATION

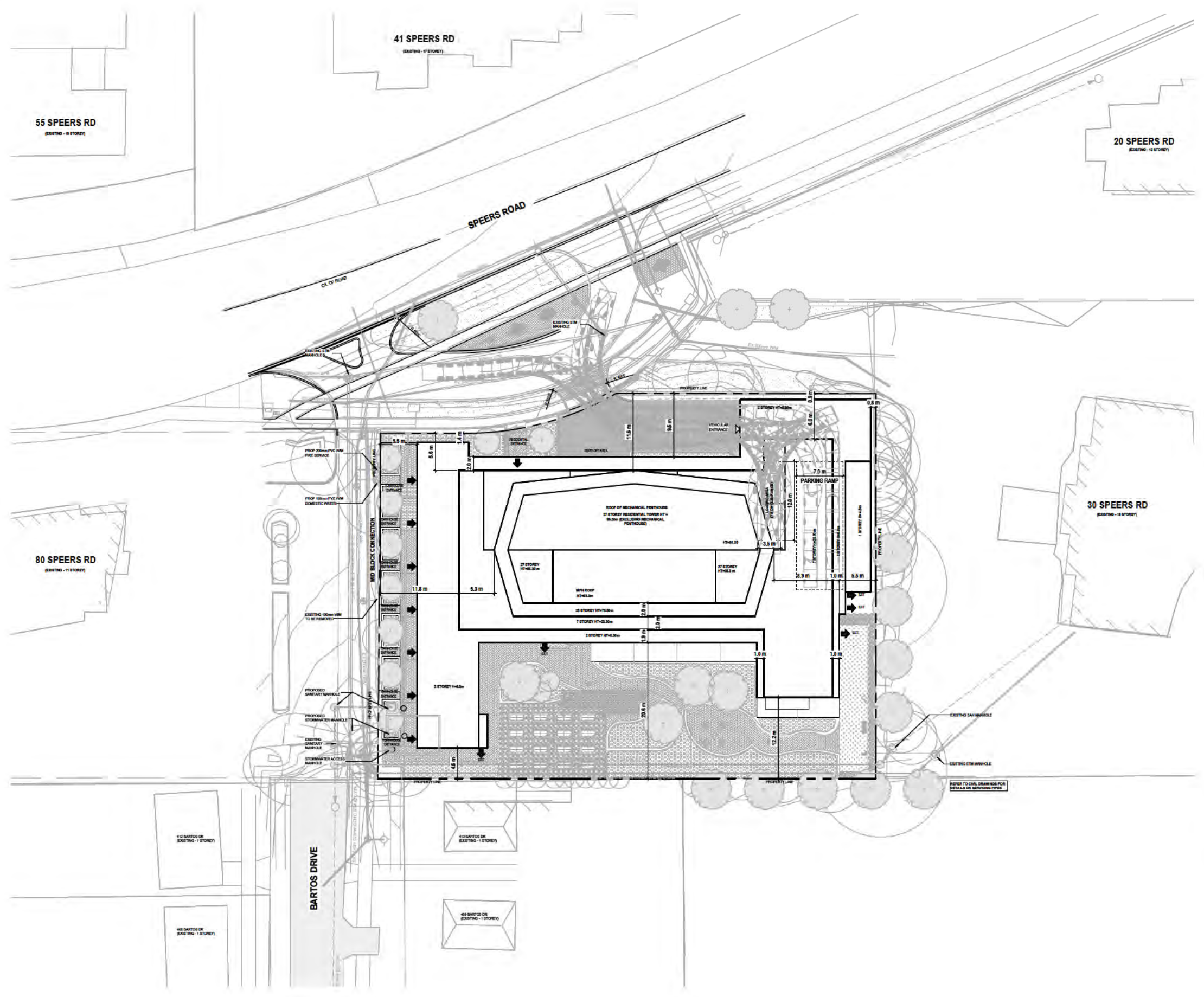
BA Consulting Group Ltd
45 St. Clair Ave. W. Suite
300
416 961 7110

CIVIL ENGINEERING

Odan-Deltech Group Inc.
5230 South Service Road, Burlington
ON L7L 5K2
905-632-3811

PLANNING & URBAN DESIGN

Boasfields Inc.
3 Church Street, Toronto ON M5E 1M2
416-947-9744



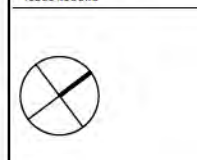
Date	No.	Description

REVISION RECORD

Date	No.	Description

ISSUE RECORD

Date	No.	Description
2024-01-23		Issued for OPA/ZSLA Resubmission v2
2022-10-12		Revising & Official Plan Amendment



BDP. Quadrangle
 Quadrangle Architects Limited
 801 King Street West, Suite 111, Toronto, ON M5X 1K6
 1-416-598-1242 www.bdpquadrangle.com

50 Speers Road
 Oakville, ON
 for
 Helberg Properties Limited

2023 1:200 VG AT
 PROJECT SCALE DRAWN REVIEWED

Concept Plan

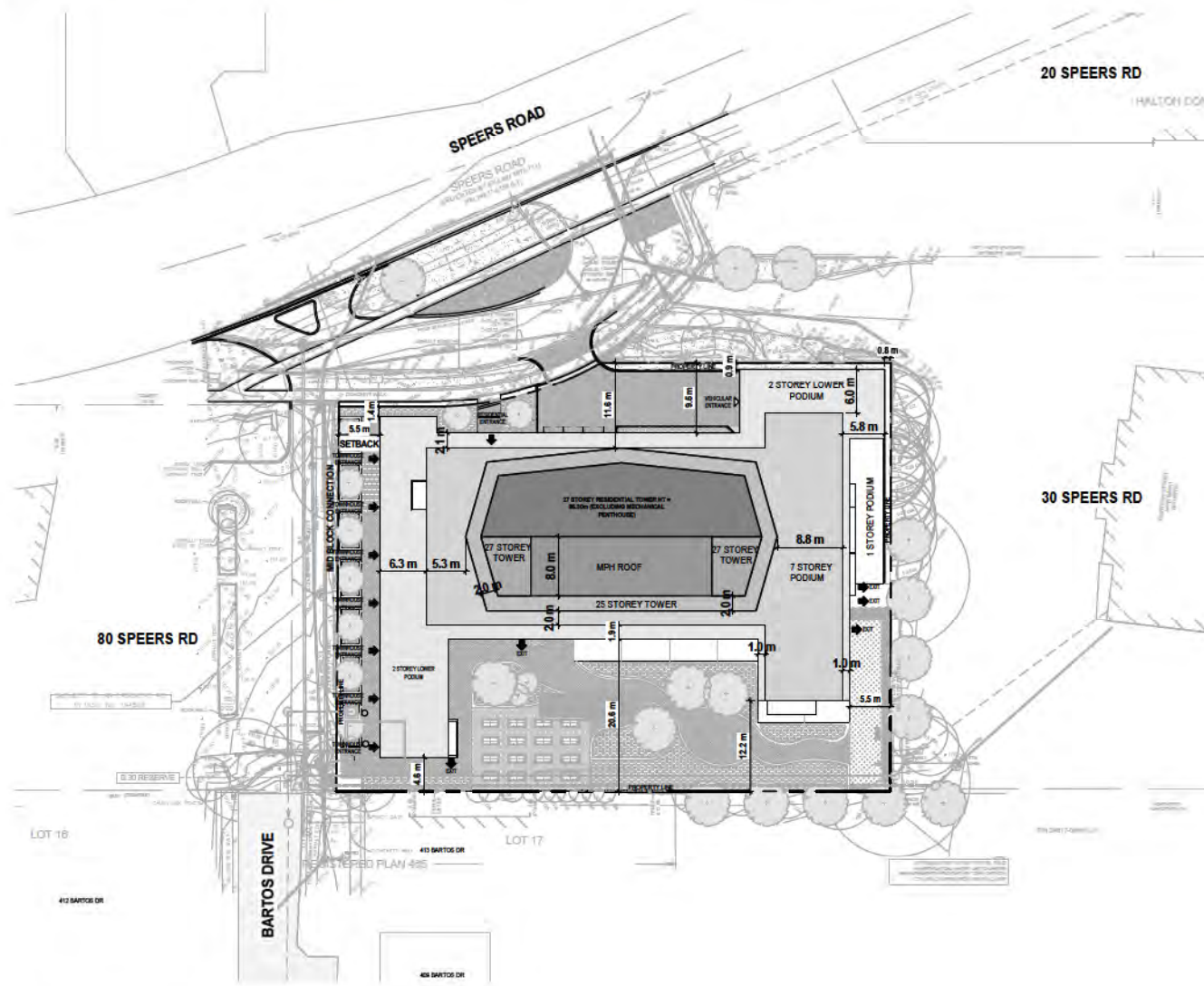
A100.S

C:\Users\jdoyle\OneDrive\Documents\A100_S\A100_S.dwg

20230810-00-00-00



5 Context Plan



4 SITE PLAN SCALE 1:300

Floor	Gross Building Area	2014-2015 Use	Gross Floor Area				Unit Breakdown				Total Units	Notes
			Sub	15	20	30	Sub	15	20	30		
Mezz/Podium	530	530	0	0	0	0	0	0	0	0	0	
27	587	79	528	0	0	0	0	0	0	0	0	4,882
26	587	79	528	0	0	0	0	0	0	0	0	5,359
25	730	79	650	0	0	0	0	0	0	0	0	6,803
24	730	79	650	0	0	0	0	0	0	0	0	6,803
23	730	79	650	0	0	0	0	0	0	0	0	6,803
22	730	79	650	0	0	0	0	0	0	0	0	6,803
21	730	79	650	0	0	0	0	0	0	0	0	6,803
20	730	79	650	0	0	0	0	0	0	0	0	7,172
19	730	79	650	0	0	0	0	0	0	0	0	7,172
18	730	79	650	0	0	0	0	0	0	0	0	7,172
17	730	79	650	0	0	0	0	0	0	0	0	7,172
16	730	79	650	0	0	0	0	0	0	0	0	7,172
15	730	79	650	0	0	0	0	0	0	0	0	7,172
14	730	79	650	0	0	0	0	0	0	0	0	7,172
13	730	79	650	0	0	0	0	0	0	0	0	7,172
12	730	79	650	0	0	0	0	0	0	0	0	7,172
11	730	79	650	0	0	0	0	0	0	0	0	7,172
10	730	79	650	0	0	0	0	0	0	0	0	7,172
9	730	79	650	0	0	0	0	0	0	0	0	7,172
8	730	79	650	0	0	0	0	0	0	0	0	7,172
7	730	79	650	0	0	0	0	0	0	0	0	7,172
6	730	79	650	0	0	0	0	0	0	0	0	7,172
5	730	79	650	0	0	0	0	0	0	0	0	7,172
4	730	79	650	0	0	0	0	0	0	0	0	7,172
3	730	79	650	0	0	0	0	0	0	0	0	7,172
2	730	79	650	0	0	0	0	0	0	0	0	7,172
1	730	79	650	0	0	0	0	0	0	0	0	7,172
MEZZ/Podium	530	530	0	0	0	0	0	0	0	0	0	
TOTALS	28,811	28,811	22,290	31	144	132	13	13	13	20	20	27,787

Area means the aggregate area of a building enclosed by the exterior walls, but does not include open basements, porches, balconies, walkways, utility rooms, etc. unless they are enclosed by exterior walls, and does not include a private garage, equipment, or other structure, unless it is enclosed by exterior walls.

Net Floor Area (NFA) means the total area of all floors of a building measured from the interior faces of the exterior walls or primary walls, but does not include the area of other walls, elevators, equipment, utility rooms, etc., unless they are enclosed by exterior walls, and does not include a private garage, equipment, or other structure, unless it is enclosed by exterior walls.

NOTE: All open to public areas are included in Floor Area and Net Floor Area unless otherwise indicated in the Block column above.

3 Building Statistics

VEHICULAR PARKING		BICYCLE PARKING	
Required	139	Required	100
Provided	179	Provided	248
Excess	40	Excess	148
Shortage	0	Shortage	0
Available	179	Available	248
Excess	40	Excess	148
Shortage	0	Shortage	0

2 Parking and Amenity Stats

Code	Description	Code	Description	Code	Description
AD	Air duct	FIN	Finish	PS	Passage set
AE	Air duct	FL	Flair	PT	Paint patch
AF	Above slab floor	FLUR	Fluor	PVC	Polyvinyl chloride
AG	Aluminum	FP	Flap	RF	Refrigerator
AH	Architect	FR	Flap	R	Railing
AI	Architectural	FRG	Fire rated concrete floor	RB	Railroad beam
AJ	Architectural	FRR	Fire resistance rating	RC	Rebar catch
AK	Architectural	FRS	Fire resistance	RD	Rebar door
AL	Architectural	FS	Fire stop	RE	Rebar
AM	Architectural	FSI	Fire stop	RF	Rebar framing
AN	Architectural	FSM	Fire stop	RFL	Rebar floor
AO	Architectural	FSN	Fire stop	RFI	Rebar floor
AP	Architectural	FSO	Fire stop	RFL	Rebar floor
AQ	Architectural	FSR	Fire stop	RFL	Rebar floor
AR	Architectural	FSU	Fire stop	RFL	Rebar floor
AS	Architectural	FSV	Fire stop	RFL	Rebar floor
AT	Architectural	FSW	Fire stop	RFL	Rebar floor
AV	Architectural	FSX	Fire stop	RFL	Rebar floor
AW	Architectural	FSY	Fire stop	RFL	Rebar floor
AX	Architectural	FSZ	Fire stop	RFL	Rebar floor
AY	Architectural	FTA	Fire stop	RFL	Rebar floor
AZ	Architectural	FTB	Fire stop	RFL	Rebar floor
BA	Architectural	FTC	Fire stop	RFL	Rebar floor
BB	Architectural	FTD	Fire stop	RFL	Rebar floor
BC	Architectural	FTE	Fire stop	RFL	Rebar floor
BD	Architectural	FTF	Fire stop	RFL	Rebar floor
BE	Architectural	FTG	Fire stop	RFL	Rebar floor
BF	Architectural	FTH	Fire stop	RFL	Rebar floor
BG	Architectural	FTI	Fire stop	RFL	Rebar floor
BH	Architectural	FTJ	Fire stop	RFL	Rebar floor
BI	Architectural	FTK	Fire stop	RFL	Rebar floor
BJ	Architectural	FTL	Fire stop	RFL	Rebar floor
BK	Architectural	FTM	Fire stop	RFL	Rebar floor
BL	Architectural	FTN	Fire stop	RFL	Rebar floor
BM	Architectural	FTO	Fire stop	RFL	Rebar floor
BN	Architectural	FTP	Fire stop	RFL	Rebar floor
BO	Architectural	FTQ	Fire stop	RFL	Rebar floor
BP	Architectural	FTR	Fire stop	RFL	Rebar floor
BQ	Architectural	FTS	Fire stop	RFL	Rebar floor
BR	Architectural	FTT	Fire stop	RFL	Rebar floor
BS	Architectural	FTU	Fire stop	RFL	Rebar floor
BT	Architectural	FTV	Fire stop	RFL	Rebar floor
BV	Architectural	FTW	Fire stop	RFL	Rebar floor
BW	Architectural	FTX	Fire stop	RFL	Rebar floor
BX	Architectural	FTY	Fire stop	RFL	Rebar floor
BY	Architectural	FTZ	Fire stop	RFL	Rebar floor
BZ	Architectural	FTA	Fire stop	RFL	Rebar floor
CA	Architectural	FTB	Fire stop	RFL	Rebar floor
CB	Architectural	FTC	Fire stop	RFL	Rebar floor
CC	Architectural	FTD	Fire stop	RFL	Rebar floor
CD	Architectural	FTE	Fire stop	RFL	Rebar floor
CE	Architectural	FTF	Fire stop	RFL	Rebar floor
CF	Architectural	FTG	Fire stop	RFL	Rebar floor
CG	Architectural	FTH	Fire stop	RFL	Rebar floor
CH	Architectural	FTI	Fire stop	RFL	Rebar floor
CI	Architectural	FTJ	Fire stop	RFL	Rebar floor
CJ	Architectural	FTK	Fire stop	RFL	Rebar floor
CK	Architectural	FTL	Fire stop	RFL	Rebar floor
CL	Architectural	FTM	Fire stop	RFL	Rebar floor
CM	Architectural	FTN	Fire stop	RFL	Rebar floor
CN	Architectural	FTO	Fire stop	RFL	Rebar floor
CO	Architectural	FTP	Fire stop	RFL	Rebar floor
CP	Architectural	FTQ	Fire stop	RFL	Rebar floor
CQ	Architectural	FTR	Fire stop	RFL	Rebar floor
CR	Architectural	FTS	Fire stop	RFL	Rebar floor
CS	Architectural	FTT	Fire stop	RFL	Rebar floor
CT	Architectural	FTU	Fire stop	RFL	Rebar floor
CU	Architectural	FTV	Fire stop	RFL	Rebar floor
CV	Architectural	FTW	Fire stop	RFL	Rebar floor
CA	Architectural	FTX	Fire stop	RFL	Rebar floor
CB	Architectural	FTY	Fire stop	RFL	Rebar floor
CC	Architectural	FTZ	Fire stop	RFL	Rebar floor
CD	Architectural	FTA	Fire stop	RFL	Rebar floor
CE	Architectural	FTB	Fire stop	RFL	Rebar floor
CF	Architectural	FTC	Fire stop	RFL	Rebar floor
CG	Architectural	FTD	Fire stop	RFL	Rebar floor
CH	Architectural	FTE	Fire stop	RFL	Rebar floor
CI	Architectural	FTF	Fire stop	RFL	Rebar floor
CJ	Architectural	FTG	Fire stop	RFL	Rebar floor
CK	Architectural	FTH	Fire stop	RFL	Rebar floor
CL	Architectural	FTI	Fire stop	RFL	Rebar floor
CM	Architectural	FTJ	Fire stop	RFL	Rebar floor
CN	Architectural	FTK	Fire stop	RFL	Rebar floor
CO	Architectural	FTL	Fire stop	RFL	Rebar floor
CP	Architectural	FTM	Fire stop	RFL	Rebar floor
CQ	Architectural	FTN	Fire stop	RFL	Rebar floor
CR	Architectural	FTO	Fire stop	RFL	Rebar floor
CS	Architectural	FTP	Fire stop	RFL	Rebar floor
CT	Architectural	FTQ	Fire stop	RFL	Rebar floor
CU	Architectural	FTR	Fire stop	RFL	Rebar floor
CV	Architectural	FTS	Fire stop	RFL	Rebar floor
CA	Architectural	FTT	Fire stop	RFL	Rebar floor
CB	Architectural	FTU	Fire stop	RFL	Rebar floor
CC	Architectural	FTV	Fire stop	RFL	Rebar floor
CD	Architectural	FTW	Fire stop	RFL	Rebar floor
CE	Architectural	FTX	Fire stop	RFL	Rebar floor
CF	Architectural	FTY	Fire stop	RFL	Rebar floor
CG	Architectural	FTZ	Fire stop	RFL	Rebar floor
CH	Architectural	FTA	Fire stop	RFL	Rebar floor
CI	Architectural	FTB	Fire stop	RFL	Rebar floor
CJ	Architectural	FTC	Fire stop	RFL	Rebar floor
CK	Architectural	FTD	Fire stop	RFL	Rebar floor
CL	Architectural	FTE	Fire stop	RFL	Rebar floor
CM	Architectural	FTF	Fire stop	RFL	Rebar floor
CN	Architectural	FTG	Fire stop	RFL	Rebar floor
CO	Architectural	FTH	Fire stop	RFL	Rebar floor
CP	Architectural	FTI	Fire stop	RFL	Rebar floor
CQ	Architectural	FTJ	Fire stop	RFL	Rebar floor
CR	Architectural	FTK	Fire stop	RFL	Rebar floor
CS	Architectural	FTL	Fire stop	RFL	Rebar floor
CT	Architectural	FTM	Fire stop	RFL	Rebar floor
CU	Architectural	FTN	Fire stop	RFL	Rebar floor
CV	Architectural	FTO	Fire stop	RFL	Rebar floor
CA	Architectural	FTP	Fire stop	RFL	Rebar floor
CB	Architectural	FTQ	Fire stop	RFL	Rebar floor
CC	Architectural	FTR	Fire stop	RFL	Rebar floor
CD	Architectural	FTS	Fire stop	RFL	Rebar floor
CE	Architectural	FTT	Fire stop	RFL	Rebar floor
CF	Architectural	FTU	Fire stop	RFL	Rebar floor
CG	Architectural	FTV	Fire stop	RFL	Rebar floor
CH	Architectural	FTW	Fire stop	RFL	Rebar floor
CI	Architectural	FTX	Fire stop	RFL	Rebar floor
CJ	Architectural	FTY	Fire stop	RFL	Rebar floor
CK	Architectural	FTZ	Fire stop	RFL	Rebar floor
CL	Architectural	FTA	Fire stop	RFL	Rebar floor
CM	Architectural	FTB	Fire stop	RFL	Rebar floor
CN	Architectural	FTC	Fire stop	RFL	Rebar floor
CO	Architectural	FTD	Fire stop	RFL	Rebar floor
CP	Architectural	FTE	Fire stop	RFL	Rebar floor
CQ	Architectural	FTF	Fire stop	RFL	Rebar floor
CR	Architectural	FTG	Fire stop	RFL	Rebar floor
CS	Architectural	FTH	Fire stop	RFL	Rebar floor
CT	Architectural	FTI	Fire stop	RFL	Rebar floor
CU	Architectural	FTJ	Fire stop	RFL	Rebar floor
CV	Architectural	FTK	Fire stop	RFL	Rebar floor
CA	Architectural	FTL	Fire stop	RFL	Rebar floor
CB	Architectural	FTM	Fire stop	RFL	Rebar floor
CC	Architectural	FTN	Fire stop	RFL	Rebar floor
CD	Architectural	FTO	Fire stop	RFL	Rebar floor
CE	Architectural	FTP	Fire stop	RFL	Rebar floor
CF	Architectural	FTQ	Fire stop	RFL	Rebar floor
CG	Architectural	FTR	Fire stop	RFL	Rebar floor
CH	Architectural	FTS	Fire stop	RFL	Rebar floor
CI					

SUBSURFACE UTILITY PLAN OF
50 SPEERS ROAD
OAKVILLE

ONSITE LOCATES INC.
© COPYRIGHT 2022



METRIC

DISTANCES AND/OR COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

COORDINATE SYSTEM

UTM ZONE 17, NAD83 CSRS (2010.0)

ELEVATION NOTE

ELEVATIONS ARE OF GEODETIC ORIGIN (CGVD-1928:78), AND ARE DERIVED FROM GNSS OBSERVATIONS AND NATURAL RESOURCES CANADA'S GEOID MODEL HT2.0.

SEWER INVERT NOTE:

SEWER INVERT DEPTHS ARE MANUALLY MEASURED FROM THE LID/GRATE OF THE GIVEN FEATURE.

ANNOTATIONS DISPLAYED AS *ITALICIZED* WITH AN ASTERISK* HAVE BEEN INTERPOLATED FROM RECORDS AND WERE NOT FIELD VERIFIED BY ONSITE LOCATES LTD.

INVERT DEPTH MEASUREMENTS ARE FROM THE ASSUMED BOTTOM OF THE FACILITY STRUCTURE.

DEPTHS ARE NOT SUITABLE FOR EXCAVATION PURPOSES. SEWER NETWORK CONNECTIONS WERE COMPILED WHERE FIELD EVIDENCE COINCIDED WITH AS-BUILT RECORDS.

WHERE NO DEPTH INFORMATION COULD BE OBTAINED, UTILITIES ARE ASSUMED TO BE AT STANDARD INSTALLATION DEPTH FOR THE SPECIFIC TYPE OF UTILITY.

THE MOST RELIABLE WAY TO PRECISELY DETERMINE THE HORIZONTAL AND VERTICAL LOCATION OF AN UNDERGROUND UTILITY IS THROUGH PHYSICAL EXPOSURE USING SAFE DIGGING TECHNIQUES (COMMONLY PERFORMED WITH HYDRO VACUUM EXCAVATION).

INVERT DEPTH MEASUREMENTS HEREON ARE PROVIDED IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

SEWER INVERT DATA TABLE

Feature ID	Direction	Diameter (mm)	Invert Depth (m)	Rim/Lid Elevation (m)	Invert Elevation (m)	Notes
S4751MHD	S/E	300	2.84	210.24	207.40	
	N/E	150	3.06	210.24	207.18	
	N/E	200	3.28	210.24	206.96	
S4751MHD	N/W	200	2.07	99.71	97.64	
	N/E	150	2.74	99.71	96.97	
	N/E	200	2.80	99.71	96.91	
S4751MHD	S/E	200	2.28	99.71	97.43	
	S/E	200	2.42	99.71	97.29	
S4751MHD	E	150	2.48	100.72	98.24	
	N/E	150	2.05	100.72	98.67	
S4751MHD	S/E	300	1.49	100.88	99.39	
	S/E	300	1.40	100.88	99.48	
	S/E	300	1.53	100.88	99.35	
S7011MHD	S	300	0.75	101.44	100.69	
	N/E	300	1.28	101.44	100.16	
	S/E	300	1.02	101.44	100.42	
S7011MHD	N/W	200	3.45	100.02	96.57	
	N/W	300	1.70	100.02	98.32	DRIP
	N/E	240	1.20	100.02	98.82	
	S/E	300	3.17	100.02	96.85	
S7011MHD	N/W	420	2.00	98.28	96.28	APPROXIMATE (RD)
	N/E	420	1.82	97.80	95.98	APPROXIMATE (RD)
CS1	S/E	300	0.82	100.00	99.18	
CS2	S/E	300	0.90	100.00	99.10	

INFORMATION OBTAINED FROM RECORDS; NOT FIELD VERIFIED BY ONSITE LOCATES INC.

UNDERGROUND UTILITY NOTES

THE UTILITY DATA DEPICTED ON THIS DRAWING WERE ACQUIRED IN ACCORDANCE WITH ASCE STANDARD 38-02. THE INFORMATION IS SHOWN BY ATTRIBUTED QUALITY LEVELS WHICH ARE DEFINED AS FOLLOWS:

DATA QUALITY LEVEL



HIGHEST QUALITY

QUALITY LEVEL "A" - INFORMATION OBTAINED BY ACTUAL PHYSICAL EXPOSURE OF TARGETED UTILITIES AND SUBSEQUENT MEASUREMENT OF THE EXPOSED PRECISE HORIZONTAL AND VERTICAL POSITION.

QUALITY LEVEL "B" - INFORMATION OBTAINED USING GEOPHYSICAL LOCATE TECHNIQUES TO IDENTIFY THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF THE DESIGNATED UTILITIES.

QUALITY LEVEL "C" - INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE UTILITY FEATURES AND BY USING PROFESSIONAL JUDGMENT IN CORRELATING THIS INFORMATION TO THE QUALITY "D" INFORMATION OBTAINED.

QUALITY LEVEL "D" - INFORMATION DERIVED FROM UTILITY RECORDS OR VERBAL RECOLLECTIONS.

ALL SERVICES ARE QUALITY "D" UNLESS NOTED OTHERWISE.

LEVEL "D" RECORD INFORMATION SHOWN ON THIS PLAN HAVE BEEN PLOTTED APPROXIMATELY AS PER THE RECORDS FOUND AND COULD NOT BE FIELD VERIFIED WITHIN THE SCOPE OF THIS PROJECT. IF FURTHER VERIFICATION IS REQUIRED, IT IS SUGGESTED THAT LEVEL "A" METHODOLOGIES BE EMPLOYED.

LOST SIGNAL - DENOTES/INDICATES A POINT WHERE Q1-B METHODS COULD NO LONGER ASCERTAIN THE HORIZONTAL POSITION OF A FACILITY.

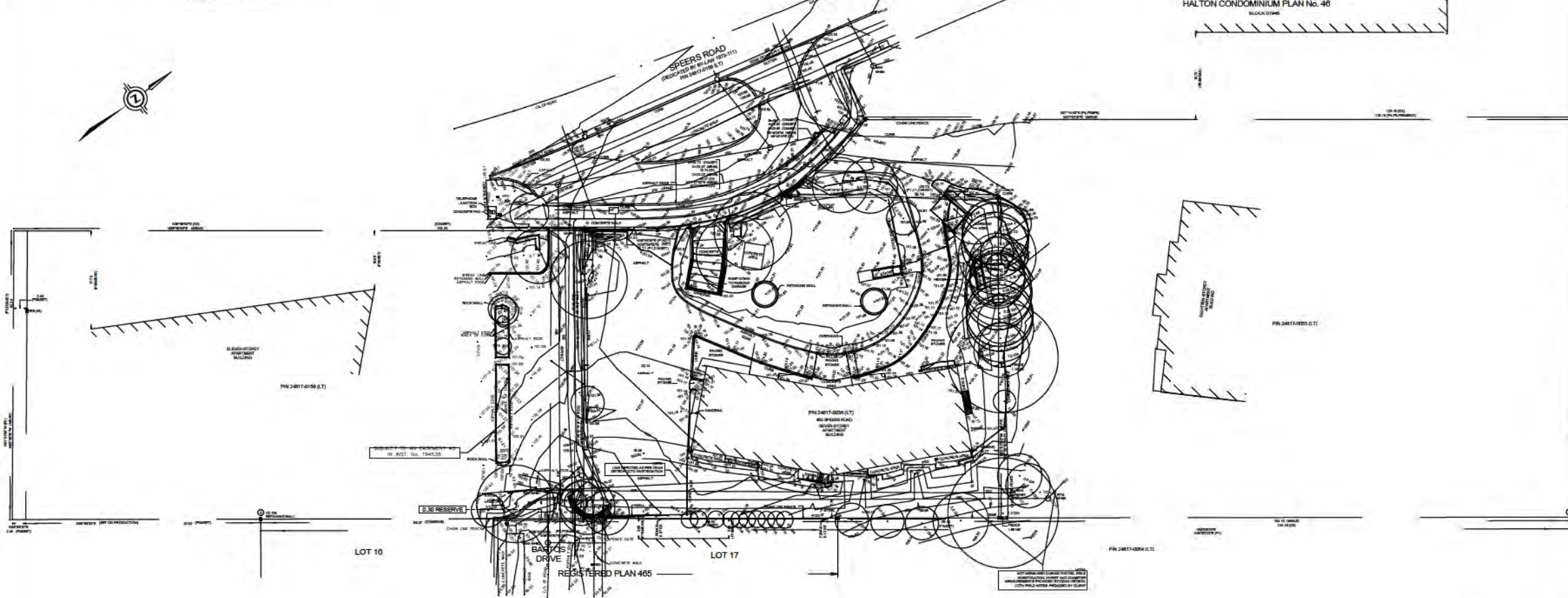
QUALITY LEVEL "D" INFORMATION COMPILED FROM RECORDS PROVIDED BY BELL, COGECO, ENBRIDGE, HALTON REGION, CITY OF OAKVILLE, AND THE CLIENT.

SUBSURFACE UTILITY FIELD WORK WAS COMPLETED ON THE 9TH DAY OF JUNE, 2022.

ONSITE LOCATES INC.
UTILITY LOCATE SERVICES
A wholly owned subsidiary of J.D. Barnes Ltd.

140 RENEW DRIVE, SUITE 100, MARKHAM, ON L3R 9E3
T: 1-800-893-6155 www.onritelocates.ca

DRAWN BY: *KS* CHECKED BY: *KM* REFERENCE NO.: 22-46-32789-Aug11
FILE: C:\18-30-458\00\Drawing\18-30-459-0.dgn DATED: 2022-06-11
PLOTTER: 8/23/22



PLAN OF SURVEY ILLUSTRATING TOPOGRAPHY OF PART OF LOTS 15 AND 16 AND PART OF ROAD ALLOWANCE BETWEEN LOTS 15 & 16, CONCESSION SOUTH OF DUNDAS STREET TOWN OF OAKVILLE REGIONAL MUNICIPALITY OF HALTON

J. D. BARNES LIMITED
REGISTERED PROFESSIONAL ENGINEER (P.E.) No. 40166
REGISTERED PROFESSIONAL SURVEYOR (P.S.) No. 10000

NOTES

- THIS PLAN IS THE PROPERTY OF J.D. BARNES LIMITED AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF J.D. BARNES LIMITED.
- THIS PLAN IS THE PROPERTY OF J.D. BARNES LIMITED AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF J.D. BARNES LIMITED.
- THIS PLAN IS THE PROPERTY OF J.D. BARNES LIMITED AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF J.D. BARNES LIMITED.

ELEVATION NOTE

ALL ELEVATIONS ARE IN METRES UNLESS OTHERWISE NOTED. ALL ELEVATIONS ARE OF GEODETIC ORIGIN (CGVD-1928:78), AND ARE DERIVED FROM GNSS OBSERVATIONS AND NATURAL RESOURCES CANADA'S GEOID MODEL HT2.0.

PRO LEGEND

- 1.00 - 1.00m Contour
- 1.05 - 1.05m Contour
- 1.10 - 1.10m Contour
- 1.15 - 1.15m Contour
- 1.20 - 1.20m Contour
- 1.25 - 1.25m Contour
- 1.30 - 1.30m Contour
- 1.35 - 1.35m Contour
- 1.40 - 1.40m Contour
- 1.45 - 1.45m Contour
- 1.50 - 1.50m Contour
- 1.55 - 1.55m Contour
- 1.60 - 1.60m Contour
- 1.65 - 1.65m Contour
- 1.70 - 1.70m Contour
- 1.75 - 1.75m Contour
- 1.80 - 1.80m Contour
- 1.85 - 1.85m Contour
- 1.90 - 1.90m Contour
- 1.95 - 1.95m Contour
- 2.00 - 2.00m Contour
- 2.05 - 2.05m Contour
- 2.10 - 2.10m Contour
- 2.15 - 2.15m Contour
- 2.20 - 2.20m Contour
- 2.25 - 2.25m Contour
- 2.30 - 2.30m Contour
- 2.35 - 2.35m Contour
- 2.40 - 2.40m Contour
- 2.45 - 2.45m Contour
- 2.50 - 2.50m Contour
- 2.55 - 2.55m Contour
- 2.60 - 2.60m Contour
- 2.65 - 2.65m Contour
- 2.70 - 2.70m Contour
- 2.75 - 2.75m Contour
- 2.80 - 2.80m Contour
- 2.85 - 2.85m Contour
- 2.90 - 2.90m Contour
- 2.95 - 2.95m Contour
- 3.00 - 3.00m Contour
- 3.05 - 3.05m Contour
- 3.10 - 3.10m Contour
- 3.15 - 3.15m Contour
- 3.20 - 3.20m Contour
- 3.25 - 3.25m Contour
- 3.30 - 3.30m Contour
- 3.35 - 3.35m Contour
- 3.40 - 3.40m Contour
- 3.45 - 3.45m Contour
- 3.50 - 3.50m Contour
- 3.55 - 3.55m Contour
- 3.60 - 3.60m Contour
- 3.65 - 3.65m Contour
- 3.70 - 3.70m Contour
- 3.75 - 3.75m Contour
- 3.80 - 3.80m Contour
- 3.85 - 3.85m Contour
- 3.90 - 3.90m Contour
- 3.95 - 3.95m Contour
- 4.00 - 4.00m Contour
- 4.05 - 4.05m Contour
- 4.10 - 4.10m Contour
- 4.15 - 4.15m Contour
- 4.20 - 4.20m Contour
- 4.25 - 4.25m Contour
- 4.30 - 4.30m Contour
- 4.35 - 4.35m Contour
- 4.40 - 4.40m Contour
- 4.45 - 4.45m Contour
- 4.50 - 4.50m Contour
- 4.55 - 4.55m Contour
- 4.60 - 4.60m Contour
- 4.65 - 4.65m Contour
- 4.70 - 4.70m Contour
- 4.75 - 4.75m Contour
- 4.80 - 4.80m Contour
- 4.85 - 4.85m Contour
- 4.90 - 4.90m Contour
- 4.95 - 4.95m Contour
- 5.00 - 5.00m Contour
- 5.05 - 5.05m Contour
- 5.10 - 5.10m Contour
- 5.15 - 5.15m Contour
- 5.20 - 5.20m Contour
- 5.25 - 5.25m Contour
- 5.30 - 5.30m Contour
- 5.35 - 5.35m Contour
- 5.40 - 5.40m Contour
- 5.45 - 5.45m Contour
- 5.50 - 5.50m Contour
- 5.55 - 5.55m Contour
- 5.60 - 5.60m Contour
- 5.65 - 5.65m Contour
- 5.70 - 5.70m Contour
- 5.75 - 5.75m Contour
- 5.80 - 5.80m Contour
- 5.85 - 5.85m Contour
- 5.90 - 5.90m Contour
- 5.95 - 5.95m Contour
- 6.00 - 6.00m Contour
- 6.05 - 6.05m Contour
- 6.10 - 6.10m Contour
- 6.15 - 6.15m Contour
- 6.20 - 6.20m Contour
- 6.25 - 6.25m Contour
- 6.30 - 6.30m Contour
- 6.35 - 6.35m Contour
- 6.40 - 6.40m Contour
- 6.45 - 6.45m Contour
- 6.50 - 6.50m Contour
- 6.55 - 6.55m Contour
- 6.60 - 6.60m Contour
- 6.65 - 6.65m Contour
- 6.70 - 6.70m Contour
- 6.75 - 6.75m Contour
- 6.80 - 6.80m Contour
- 6.85 - 6.85m Contour
- 6.90 - 6.90m Contour
- 6.95 - 6.95m Contour
- 7.00 - 7.00m Contour
- 7.05 - 7.05m Contour
- 7.10 - 7.10m Contour
- 7.15 - 7.15m Contour
- 7.20 - 7.20m Contour
- 7.25 - 7.25m Contour
- 7.30 - 7.30m Contour
- 7.35 - 7.35m Contour
- 7.40 - 7.40m Contour
- 7.45 - 7.45m Contour
- 7.50 - 7.50m Contour
- 7.55 - 7.55m Contour
- 7.60 - 7.60m Contour
- 7.65 - 7.65m Contour
- 7.70 - 7.70m Contour
- 7.75 - 7.75m Contour
- 7.80 - 7.80m Contour
- 7.85 - 7.85m Contour
- 7.90 - 7.90m Contour
- 7.95 - 7.95m Contour
- 8.00 - 8.00m Contour
- 8.05 - 8.05m Contour
- 8.10 - 8.10m Contour
- 8.15 - 8.15m Contour
- 8.20 - 8.20m Contour
- 8.25 - 8.25m Contour
- 8.30 - 8.30m Contour
- 8.35 - 8.35m Contour
- 8.40 - 8.40m Contour
- 8.45 - 8.45m Contour
- 8.50 - 8.50m Contour
- 8.55 - 8.55m Contour
- 8.60 - 8.60m Contour
- 8.65 - 8.65m Contour
- 8.70 - 8.70m Contour
- 8.75 - 8.75m Contour
- 8.80 - 8.80m Contour
- 8.85 - 8.85m Contour
- 8.90 - 8.90m Contour
- 8.95 - 8.95m Contour
- 9.00 - 9.00m Contour
- 9.05 - 9.05m Contour
- 9.10 - 9.10m Contour
- 9.15 - 9.15m Contour
- 9.20 - 9.20m Contour
- 9.25 - 9.25m Contour
- 9.30 - 9.30m Contour
- 9.35 - 9.35m Contour
- 9.40 - 9.40m Contour
- 9.45 - 9.45m Contour
- 9.50 - 9.50m Contour
- 9.55 - 9.55m Contour
- 9.60 - 9.60m Contour
- 9.65 - 9.65m Contour
- 9.70 - 9.70m Contour
- 9.75 - 9.75m Contour
- 9.80 - 9.80m Contour
- 9.85 - 9.85m Contour
- 9.90 - 9.90m Contour
- 9.95 - 9.95m Contour
- 10.00 - 10.00m Contour

SURVEYOR'S CERTIFICATE

I, J.D. BARNES, a Professional Engineer (P.E.) No. 40166 and a Professional Surveyor (P.S.) No. 10000, do hereby certify that I am a duly qualified and licensed Professional Engineer and Professional Surveyor in the Province of Ontario, Canada, and that I am duly qualified and licensed to perform the services herein described.

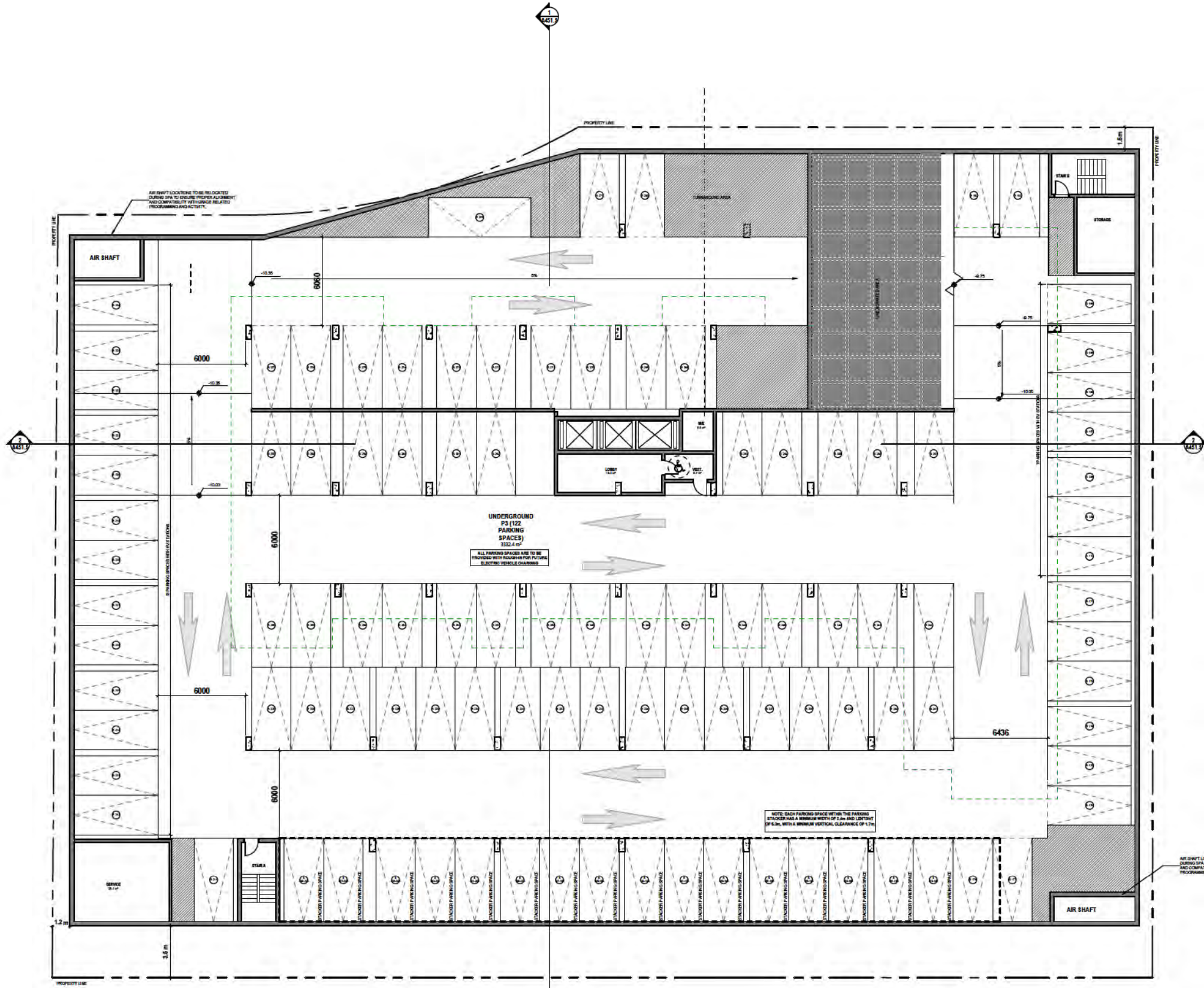
Dated this 23rd day of June, 2022.

J.D. Barnes
Professional Engineer (P.E.) No. 40166
Professional Surveyor (P.S.) No. 10000

J.D. BARNES LIMITED
LAND SURVEYORS & ENGINEERS
140 RENEW DRIVE, SUITE 100, MARKHAM, ON L3R 9E3
T: 1-800-893-6155
www.onritelocates.ca

REVISION RECORD

No.	Description	Date
001	ISSUED FOR PERMIT	2022-06-11
002	ISSUED FOR PERMIT	2022-06-11
003	ISSUED FOR PERMIT	2022-06-11
004	ISSUED FOR PERMIT	2022-06-11
005	ISSUED FOR PERMIT	2022-06-11
006	ISSUED FOR PERMIT	2022-06-11
007	ISSUED FOR PERMIT	2022-06-11
008	ISSUED FOR PERMIT	2022-06-11
009	ISSUED FOR PERMIT	2022-06-11
010	ISSUED FOR PERMIT	2022-06-11
011	ISSUED FOR PERMIT	2022-06-11
012	ISSUED FOR PERMIT	2022-06-11
013	ISSUED FOR PERMIT	2022-06-11
014	ISSUED FOR PERMIT	2022-06-11
015	ISSUED FOR PERMIT	2022-06-11
016	ISSUED FOR PERMIT	2022-06-11
017	ISSUED FOR PERMIT	2022-06-11
018	ISSUED FOR PERMIT	2022-06-11
019	ISSUED FOR PERMIT	2022-06-11
020	ISSUED FOR PERMIT	2022-06-11
021	ISSUED FOR PERMIT	2022-06-11
022	ISSUED FOR PERMIT	2022-06-11
023	ISSUED FOR PERMIT	2022-06-11
024	ISSUED FOR PERMIT	2022-06-11
025	ISSUED FOR PERMIT	2022-06-11
026	ISSUED FOR PERMIT	2022-06-11
027	ISSUED FOR PERMIT	2022-06-11
028	ISSUED FOR PERMIT	2022-06-11
029	ISSUED FOR PERMIT	2022-06-11
030	ISSUED FOR PERMIT	2022-06-11
031	ISSUED FOR PERMIT	2022-06-11
032	ISSUED FOR PERMIT	2022-06-11
033	ISSUED FOR PERMIT	2022-06-11
034	ISSUED FOR PERMIT	2022-06-11
035	ISSUED FOR PERMIT	2022-06-11
036	ISSUED FOR PERMIT	2022-06-11
037	ISSUED FOR PERMIT	2022-06-11
038	ISSUED FOR PERMIT	2022-06-11
039	ISSUED FOR PERMIT	2022-06-11
040	ISSUED FOR PERMIT	2022-06-11
041	ISSUED FOR PERMIT	2022-06-11
042	ISSUED FOR PERMIT	2022-06-11
043	ISSUED FOR PERMIT	2022-06-11
044	ISSUED FOR PERMIT	2022-06-11
045	ISSUED FOR PERMIT	2022-06-11
046	ISSUED FOR PERMIT	2022-06-11
047	ISSUED FOR PERMIT	2022-06-11
048	ISSUED FOR PERMIT	2022-06-11
049	ISSUED FOR PERMIT	2022-06-11
050	ISSUED FOR PERMIT	2022-06-11
051	ISSUED FOR PERMIT	2022-06-11
052	ISSUED FOR PERMIT	2022-06-11
053	ISSUED FOR PERMIT	2022-06-11
054	ISSUED FOR PERMIT	2022-06-11
055	ISSUED FOR PERMIT	2022-06-11
056	ISSUED FOR PERMIT	2022-06-11
057	ISSUED FOR PERMIT	2022-06-11
058	ISSUED FOR PERMIT	2022-06-11
059	ISSUED FOR PERMIT	2022-06-11
060	ISSUED FOR PERMIT	2022-06-11
061	ISSUED FOR PERMIT	2022-06-11
062	ISSUED FOR PERMIT	2022-06-11
063	ISSUED FOR PERMIT	2022-06-11
064	ISSUED FOR PERMIT	2022-06-11
065	ISSUED FOR PERMIT	2022-06-11
066	ISSUED FOR PERMIT	2022-06-11
067	ISSUED FOR PERMIT	2022-06-11
068	ISSUED FOR PERMIT	2022-06-11
069	ISSUED FOR PERMIT	2022-06-11
070	ISSUED FOR PERMIT	2022-06-11
071	ISSUED FOR PERMIT	2022-06-11
072	ISSUED FOR PERMIT	2022-06-11
073	ISSUED FOR PERMIT	2022-06-11
074	ISSUED FOR PERMIT	2022-06-11
075	ISSUED FOR PERMIT	2022-06-11
076	ISSUED FOR PERMIT	2022-06-11
077	ISSUED FOR PERMIT	2022-06-11
078	ISSUED FOR PERMIT	2022-06-11
079	ISSUED FOR PERMIT	2022-06-11
080	ISSUED FOR PERMIT	2022-06-11
081	ISSUED FOR PERMIT	2022-06-11
082	ISSUED FOR PERMIT	2022-06-11
083	ISSUED FOR PERMIT	2022-06-11
084	ISSUED FOR PERMIT	2022-06-11
085	ISSUED FOR PERMIT	2022-06-11



1 PARKING LEVEL 3
SCALE: 1:100

- PARKING NOTES:**
- MINIMUM PARKING SPACE SIZES (UNLESS OTHERWISE NOTED):
 - 3000mm WIDE x 6000mm LONG (NO VEHICLES RESTRICTED)
 - 3000mm WIDE x 5000mm LONG (ONE SIDE OBSTRUCTED)
 - 3000mm WIDE x 4000mm LONG (TWO SIDES OBSTRUCTED)
 - MAINTAIN MINIMUM DRIVE AISLE WIDTH OF 6000mm UNLESS OTHERWISE NOTED.
 - MAINTAIN MINIMUM HEADROOM CLEARANCE OF 2000mm MINIMUM.
- PARKING LEGEND:**
- COMMERCIAL PARKING SPACE
 - RESIDENTIAL PARKING SPACE
 - VISITOR PARKING SPACE
 - EXISTING PARKING SPACE
 - BIKE LOCKER
 - BIKE PARKING (STACKED)
 - BIKE PARKING (NORMAL)
 - COMES MIRROR
 - ELECTRIC VEHICLE
 - LIGHT STANDARD
 - PAINTED LINES
 - FIX-RAISED BULKHEAD
- ACCESSIBLE:**
- ACCESSIBLE VISITOR - TYPE A
 - ACCESSIBLE VISITOR - TYPE B

Date	No.	Description
2024-01-23	1	Issued for OPA/25LA Resubmission v2
2022-10-12	2	Reasoning & Official Plan Amendment

REVISION RECORD

Date	No.	Description
2024-01-23	1	Issued for OPA/25LA Resubmission v2
2022-10-12	2	Reasoning & Official Plan Amendment

ISSUE RECORD

BDP. Quadrangle

Quadrangle Architecture Limited
 501 King Street West, Suite 111 Toronto, ON M5X 1K4
 416-598-1242 www.bdpquadrangle.com

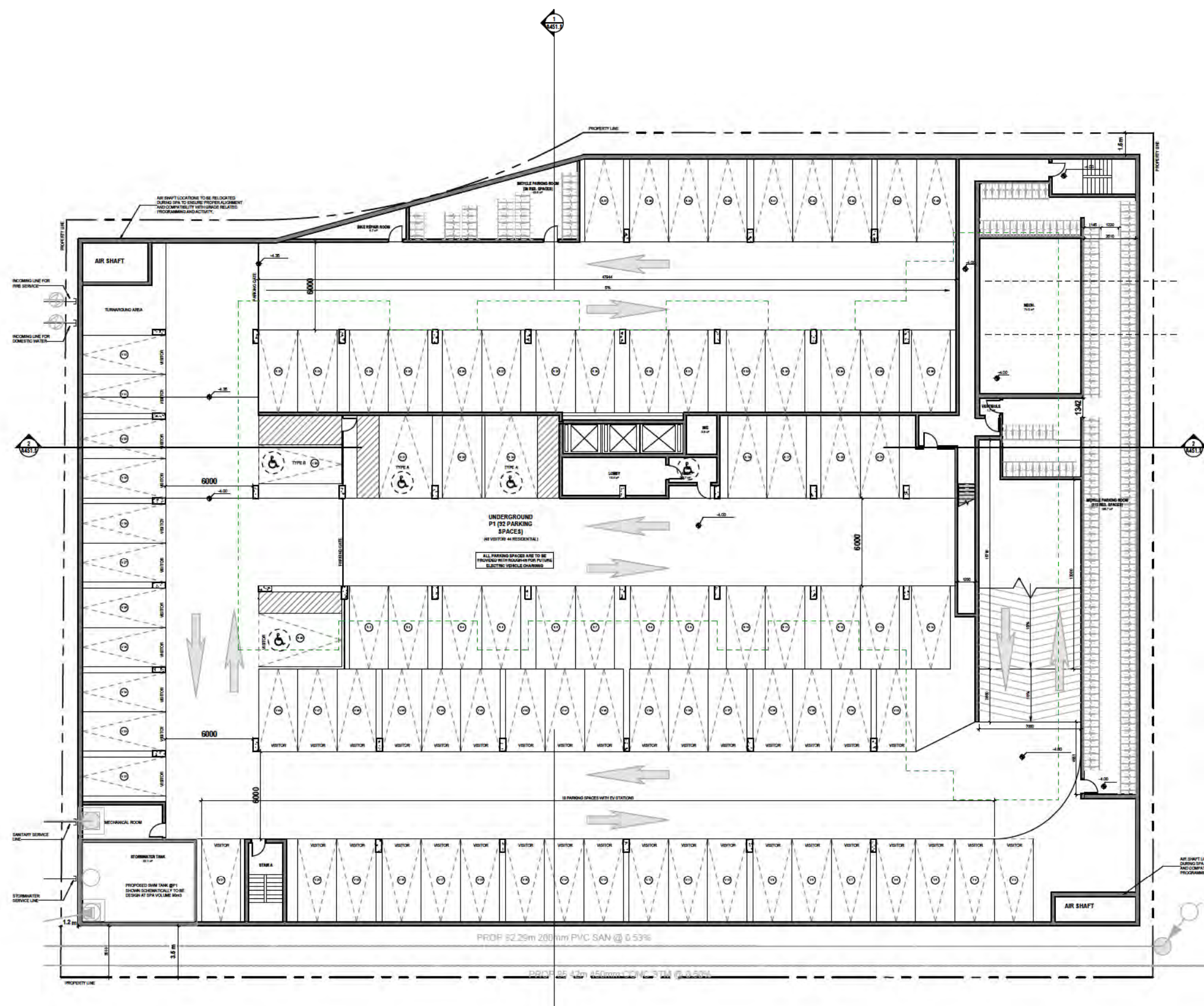
50 Speers Road
 Oakville, ON
 for Helberg Properties Limited

2023 As indicated ED, VG AT
 PROJECT SCALE DRAWN REVIEWED

P3 Underground
A103.S

C:\Users\jdoyle\Documents\A103_S\A103_S.dwg 2024-01-23 10:00:00 AM

20230804 048 04/24



1 PARKING LEVEL 1
SCALE: 1:100

- PARKING NOTES:**
- MINIMUM PARKING SPACE SIZES (UNLESS OTHERWISE NOTED):
 - 3000mm WIDE x 5000mm LONG (NO VEHICLES RESTRICTED)
 - 3000mm WIDE x 5000mm LONG (ONE SIDE OBSTRUCTED)
 - 3000mm WIDE x 4500mm LONG (TWO SIDES OBSTRUCTED)
 - MAINTAIN MINIMUM DRIVE AISLE WIDTH OF 8000mm UNLESS OTHERWISE NOTED.
 - MAINTAIN MINIMUM HEADROOM CLEARANCE OF 2000mm MINIMUM.
- PARKING LEGEND:**
- COMMERCIAL PARKING SPACE
 - RESIDENTIAL PARKING SPACE
 - VISITOR PARKING SPACE
 - EXISTING PARKING SPACE
 - BIKE LOCKER
 - BIKE PARKING (STACKS)
 - BIKE PARKING (VERTICAL)
 - CONCERN MIRROR
 - ELECTRIC VEHICLE
 - LIGHT STANDARD
 - PAVING LINES
 - FIXED-AID BALUSHEAD
- Typical dimensions for parking spaces and aisles are shown with callouts.

Date	No.	Description
2024-01-23	1	Issued for OPA/ZSLA Resubmission v2
2022-10-12	2	Revising & Official Plan Amendment

REVISION RECORD

Date	No.	Description

ISSUE RECORD

BDP. Quadrangle

Quadrangle Architecture Limited
 501 King Street West, Suite 111 Toronto, ON M5X 1K6
 416-598-1242 www.bdpquadrangle.com

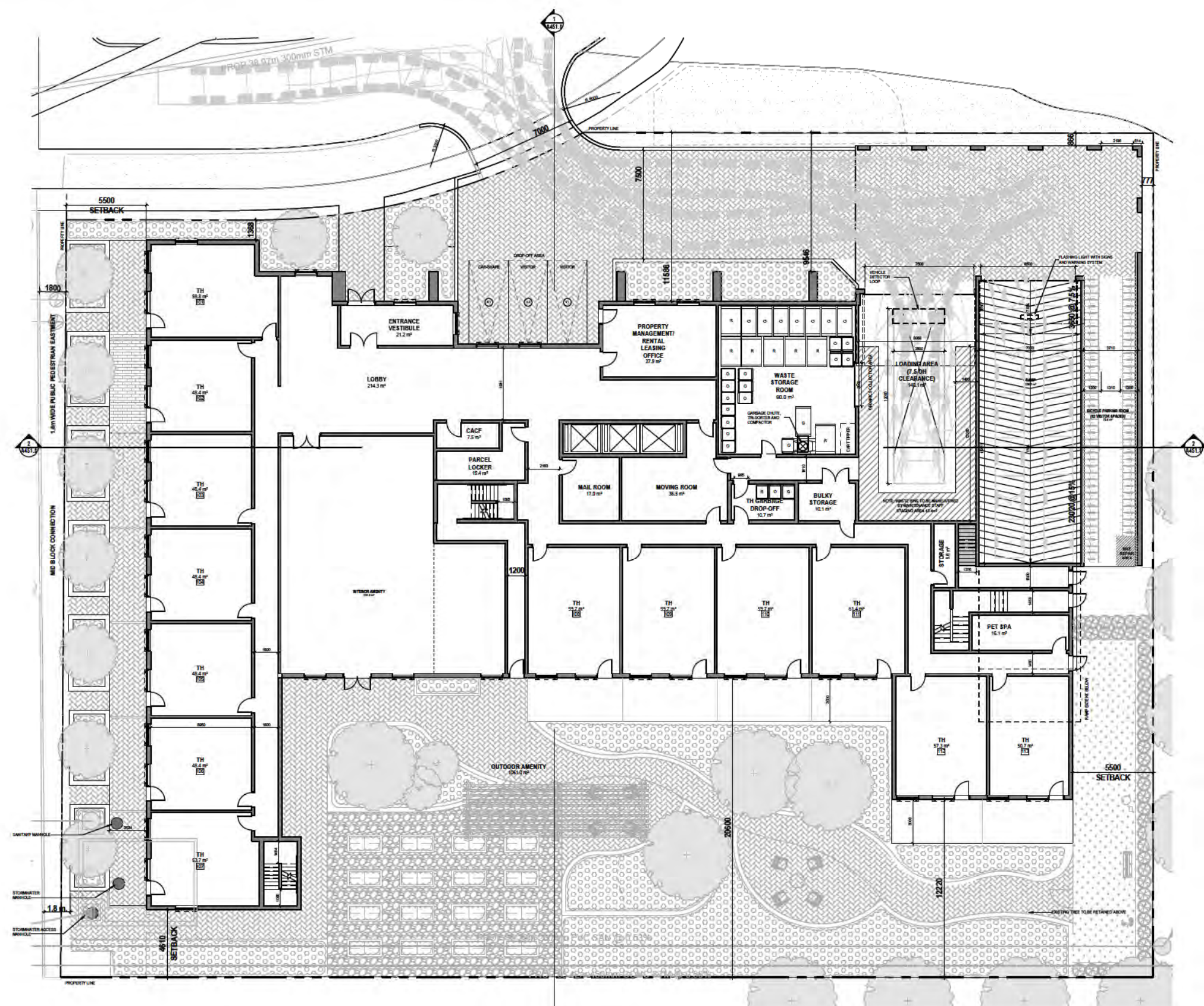
50 Speers Road
 Oakville, ON
 for Helberg Properties Limited

2023 As indicated ED, VG AT
 PROJECT SCALE DRAWN REVIEWED

P1 Underground

A105.S

Note: This drawing is the property of the Architect and may not be reproduced or used without the written consent of the Architect. The Contractor is responsible for making the building comply with all applicable codes and regulations and for obtaining all necessary permits and approvals prior to commencing work.



1 GROUND FLOOR PLAN
SCALE: 1:100

SITE PLAN LEGEND

	PROJECT USE
	LEVEL OF UNDERPINNING DAMAGE BELOW
	MAIN BUILDING ENTRANCE
	RETAIL ENTRANCE
	EXIT
	VEHICLE LOADING ENTRANCE / EXIT
	FIRE HYDRANT
	MANHOLE CONNECTION
	MANHOLE COVER
	AREA DRAIN
	CATCH BASIN
	FLOOR DRAIN (PARKING SLAB)
	FLOOR DRAIN (INTERIOR)
	EXISTING LIGHT
	TYPICAL PARKING SPACE
	TYPICAL B.F. PARKING SPACE
	FRESH FLOOR ELEVATION
	EXISTING ELEVATION
	PROPOSED ELEVATION
	TOP OF ROOF
	BUILDING ENVELOPE
	FIRE ACCESS ROUTE HEAVY DUTY PARKING ASSEMBLY TO BE DESIGNED TO MEET THE LOADS IMPOSED BY FIRE FIGHTING EQUIPMENT
	GREEN ROOF
	TERRACE PAVING

Date	No.	Description
2024-01-23	1	Issued for OPA/ZSLA Resolution v2
2022-10-12	1	Planning & Official Plan Amendment

REVISION RECORD

No.	Description

ISSUE RECORD

No.	Description

BDP. Quadrangle

Quadrangle Architects Limited
80 King Street West, Suite 111 Toronto, ON M5X 1C6
1-416-598-1340 www.bdpquadrangle.com

50 Speers Road
Oakville, ON
for
Helberg Properties Limited

2023 1:100 ED, VS AT
PROJECT SCALE DRAWN REVIEWED

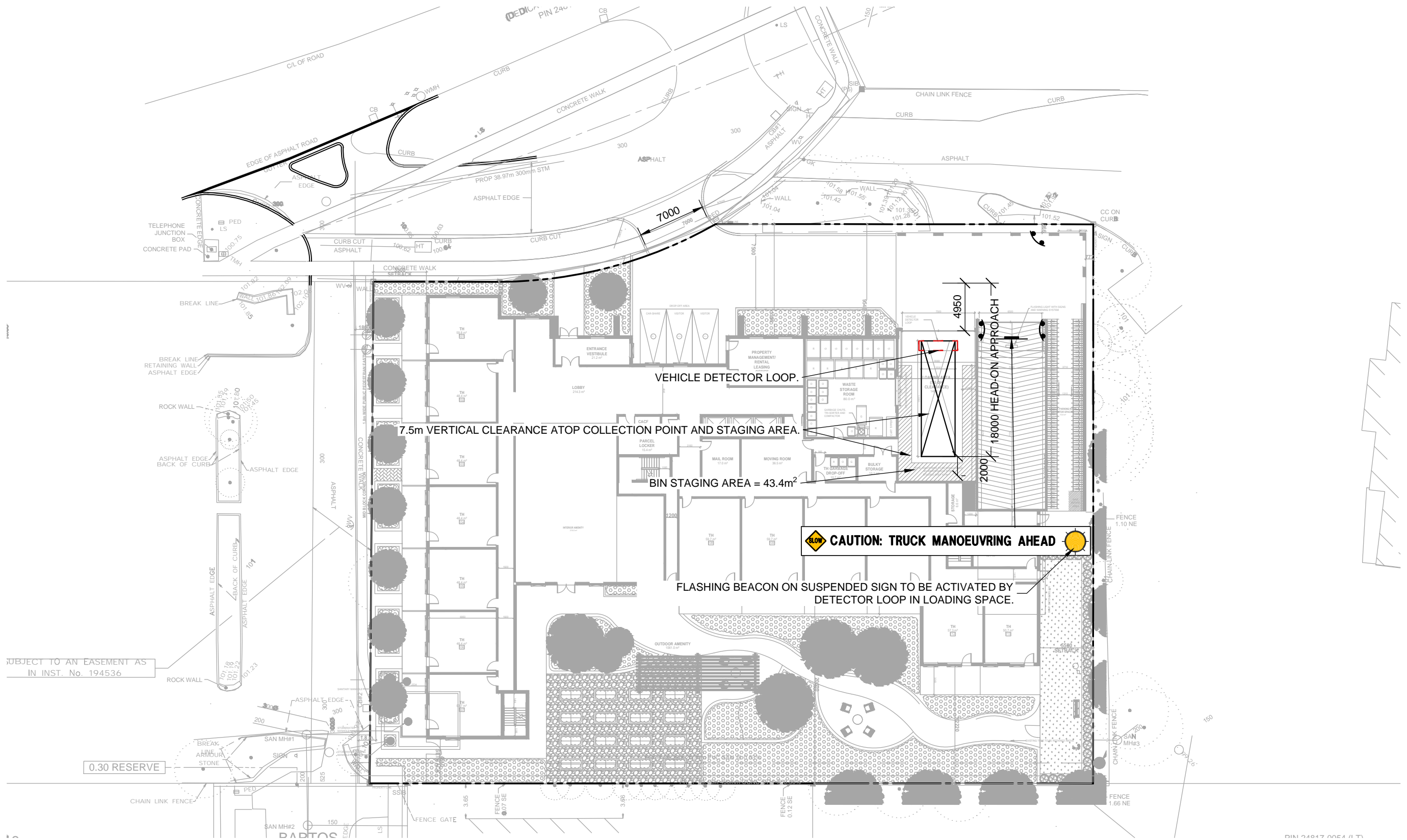
Ground Floor Plan
A201.S

Note: This drawing is the property of the Architect and shall not be reproduced, copied, altered, or otherwise used without the written consent of the Architect. The Architect is responsible for ensuring that all drawings and documents are kept up to date and conform to the latest and most applicable codes and regulations.

Appendix C

Vehicle Manoeuvring Diagrams





Date Plotted: February 29, 2024 File name: J:\8013-02\BA\SPR\2024\12 - Feb27-24\BA-50 Speers Rd-SPR-12-Feb27-24-8013-02.dwg

SUBJECT TO AN EASEMENT AS IN INST. No. 194536

0.30 RESERVE

CAUTION: TRUCK MANOEUVRING AHEAD

FLASHING BEACON ON SUSPENDED SIGN TO BE ACTIVATED BY DETECTOR LOOP IN LOADING SPACE.

VEHICLE DETECTOR LOOP.

7.5m VERTICAL CLEARANCE ATOP COLLECTION POINT AND STAGING AREA.

BIN STAGING AREA = 43.4m²

4950

18000 HEAD-ON APPROACH

7000



50 SPEERS ROAD SITE PLAN REVIEW GROUND FLOOR

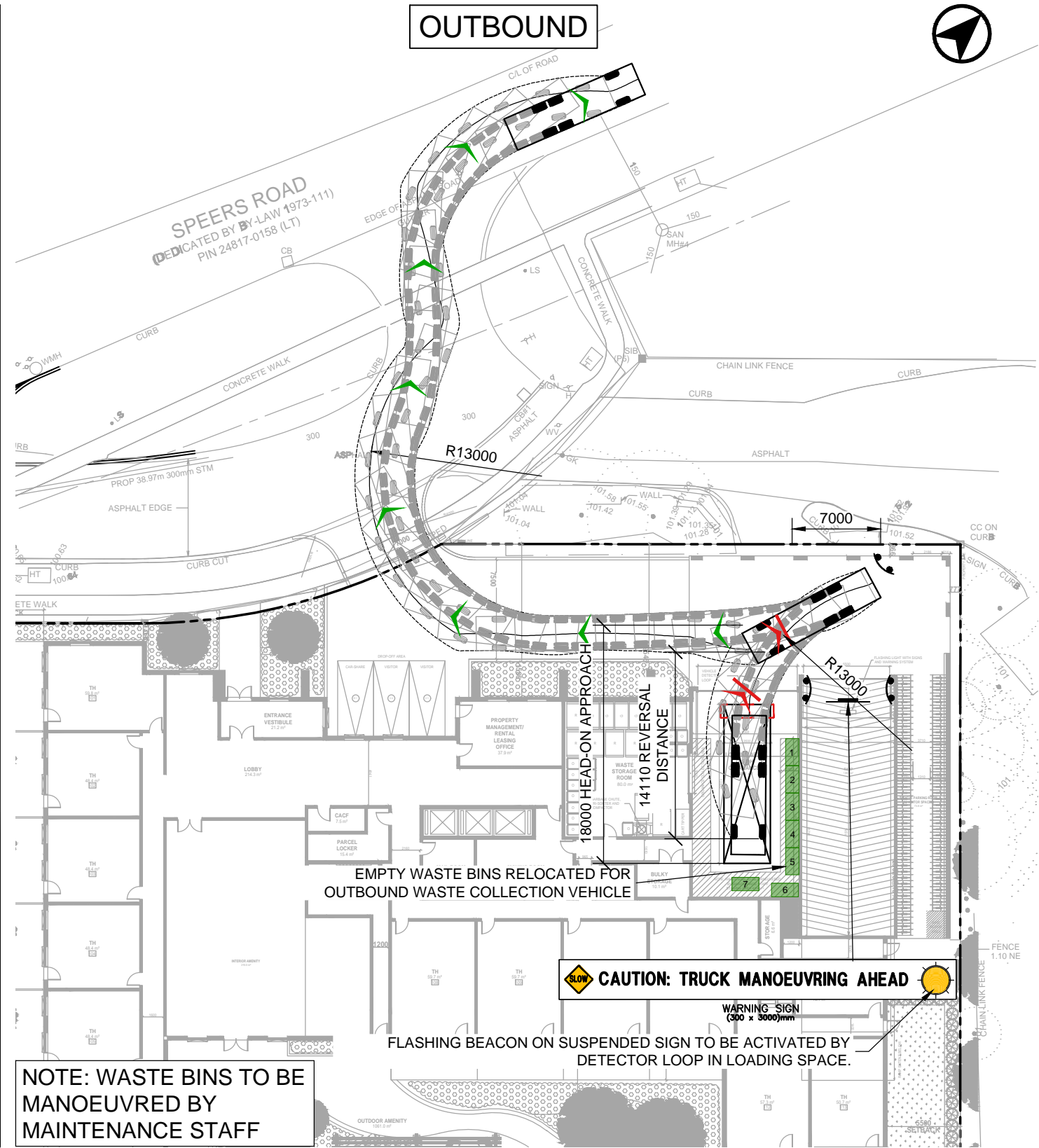
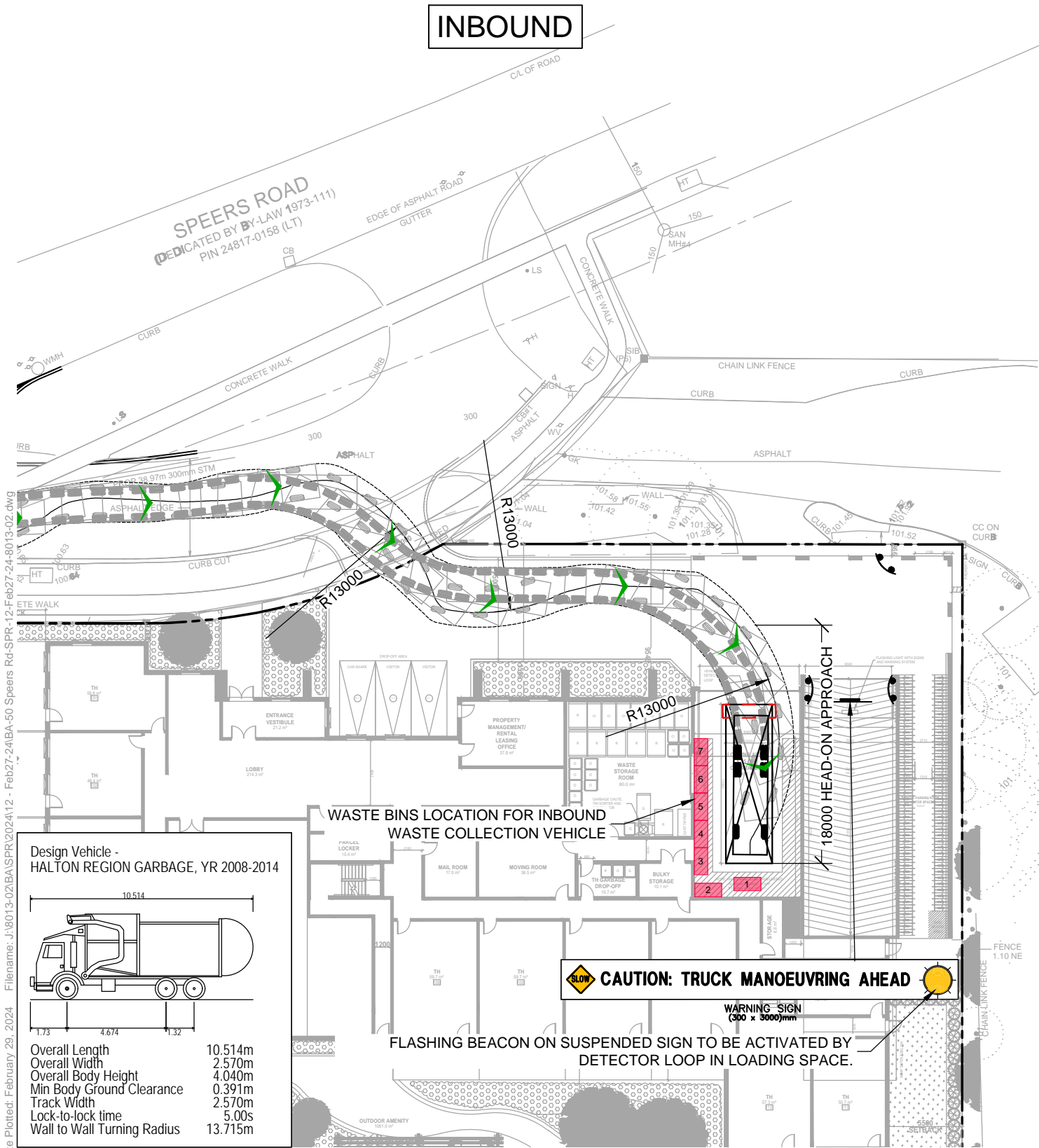
Project: 50 SPEERS ROAD
Project No. 8013-02
Date: June 7, 2022
Revised: February 29, 2024



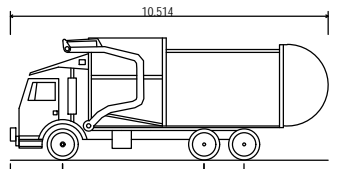
Drawing No. **SPR-01**

INBOUND

OUTBOUND



Design Vehicle -
HALTON REGION GARBAGE, YR 2008-2014



Overall Length 10.514m
Overall Width 2.570m
Overall Body Height 4.040m
Min Body Ground Clearance 0.391m
Track Width 2.570m
Lock-to-lock time 5.00s
Wall to Wall Turning Radius 13.715m

CAUTION: TRUCK MANOEUVRING AHEAD

WARNING SIGN (300 x 3000)mm

FLASHING BEACON ON SUSPENDED SIGN TO BE ACTIVATED BY DETECTOR LOOP IN LOADING SPACE.

CAUTION: TRUCK MANOEUVRING AHEAD

WARNING SIGN (300 x 3000)mm

FLASHING BEACON ON SUSPENDED SIGN TO BE ACTIVATED BY DETECTOR LOOP IN LOADING SPACE.

NOTE: WASTE BINS TO BE MANOEUVRED BY MAINTENANCE STAFF



**50 SPEERS ROAD
VEHICLE MANOEUVRING DIAGRAM
HALTON REGION GARBAGE TRUCK**

Project: 50 SPEERS ROAD
Project No. 8013-02
Date: June 7, 2022
Revised: February 29, 2024

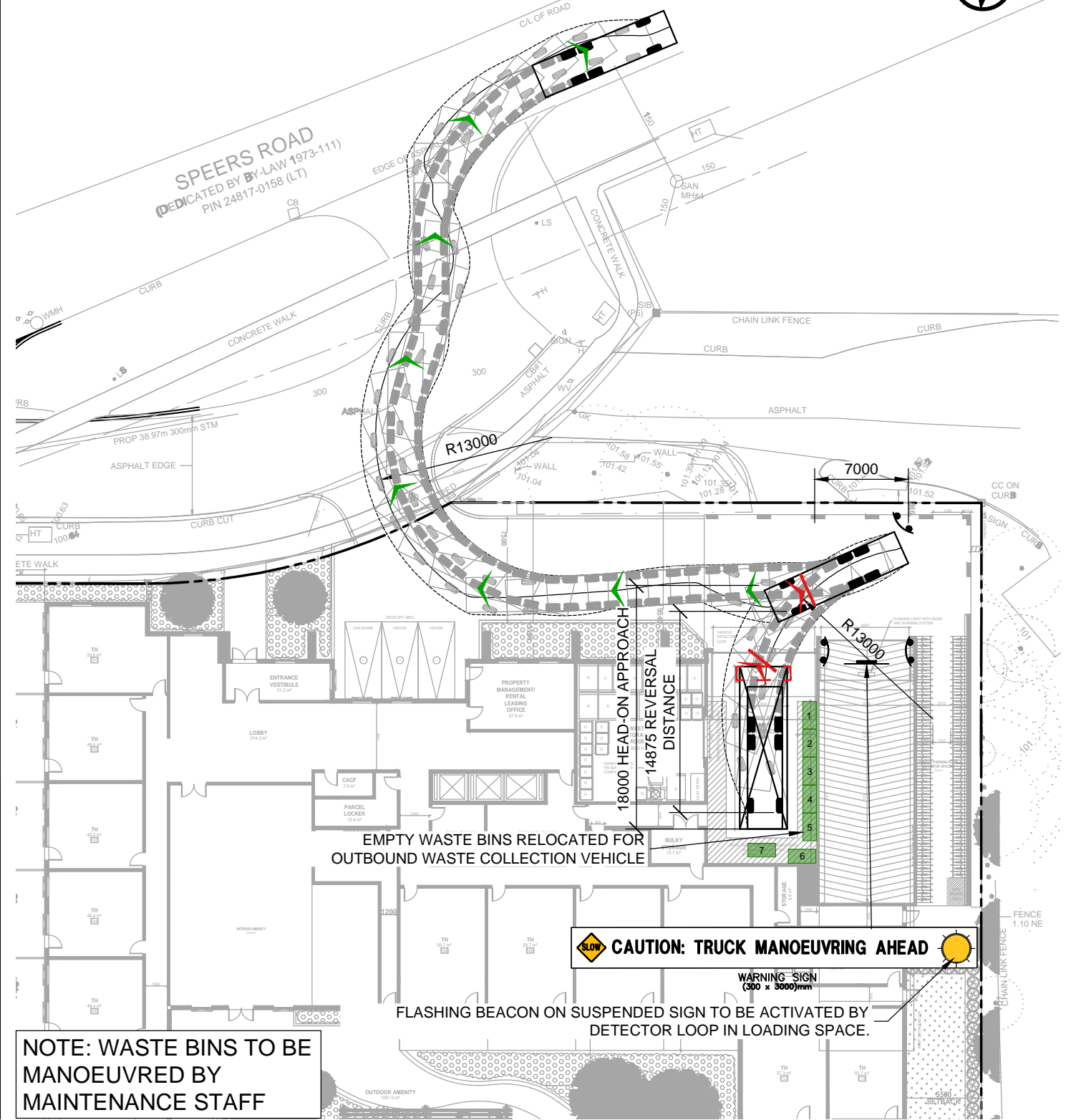
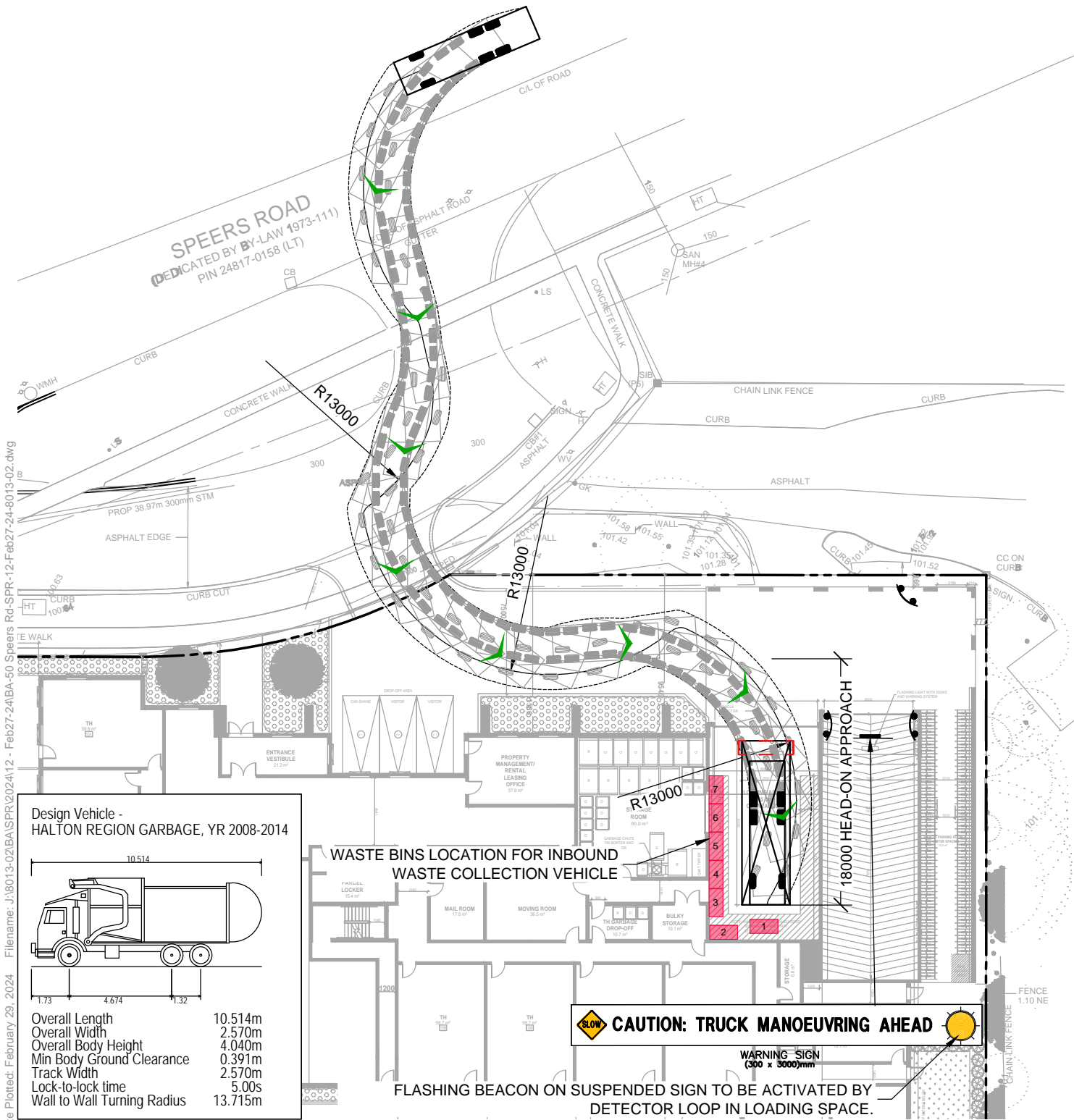


Drawing No. **VMD-01**

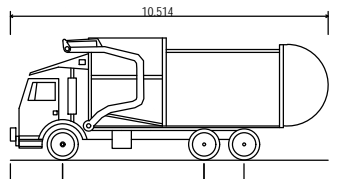
Date Plotted: February 29, 2024 File Name: J:\8013-02\BAS\PR2024\12 - Feb27-24\BA-50 Speers Rd-SPR-12-Feb27-24-8013-02.dwg

INBOUND

OUTBOUND



Design Vehicle -
HALTON REGION GARBAGE, YR 2008-2014



Overall Length 10.514m
Overall Width 2.570m
Overall Body Height 4.040m
Min Body Ground Clearance 0.391m
Track Width 2.570m
Lock-to-lock time 5.00s
Wall to Wall Turning Radius 13.715m

WASTE BINS LOCATION FOR INBOUND WASTE COLLECTION VEHICLE

18000 HEAD-ON APPROACH

CAUTION: TRUCK MANOEUVRING AHEAD

FLASHING BEACON ON SUSPENDED SIGN TO BE ACTIVATED BY DETECTOR LOOP IN LOADING SPACE.

EMPTY WASTE BINS RELOCATED FOR OUTBOUND WASTE COLLECTION VEHICLE

CAUTION: TRUCK MANOEUVRING AHEAD

NOTE: WASTE BINS TO BE MANOEUVRED BY MAINTENANCE STAFF

FLASHING BEACON ON SUSPENDED SIGN TO BE ACTIVATED BY DETECTOR LOOP IN LOADING SPACE.



**50 SPEERS ROAD
VEHICLE MANOEUVRING DIAGRAM
HALTON REGION GARBAGE TRUCK
LEFT IN**

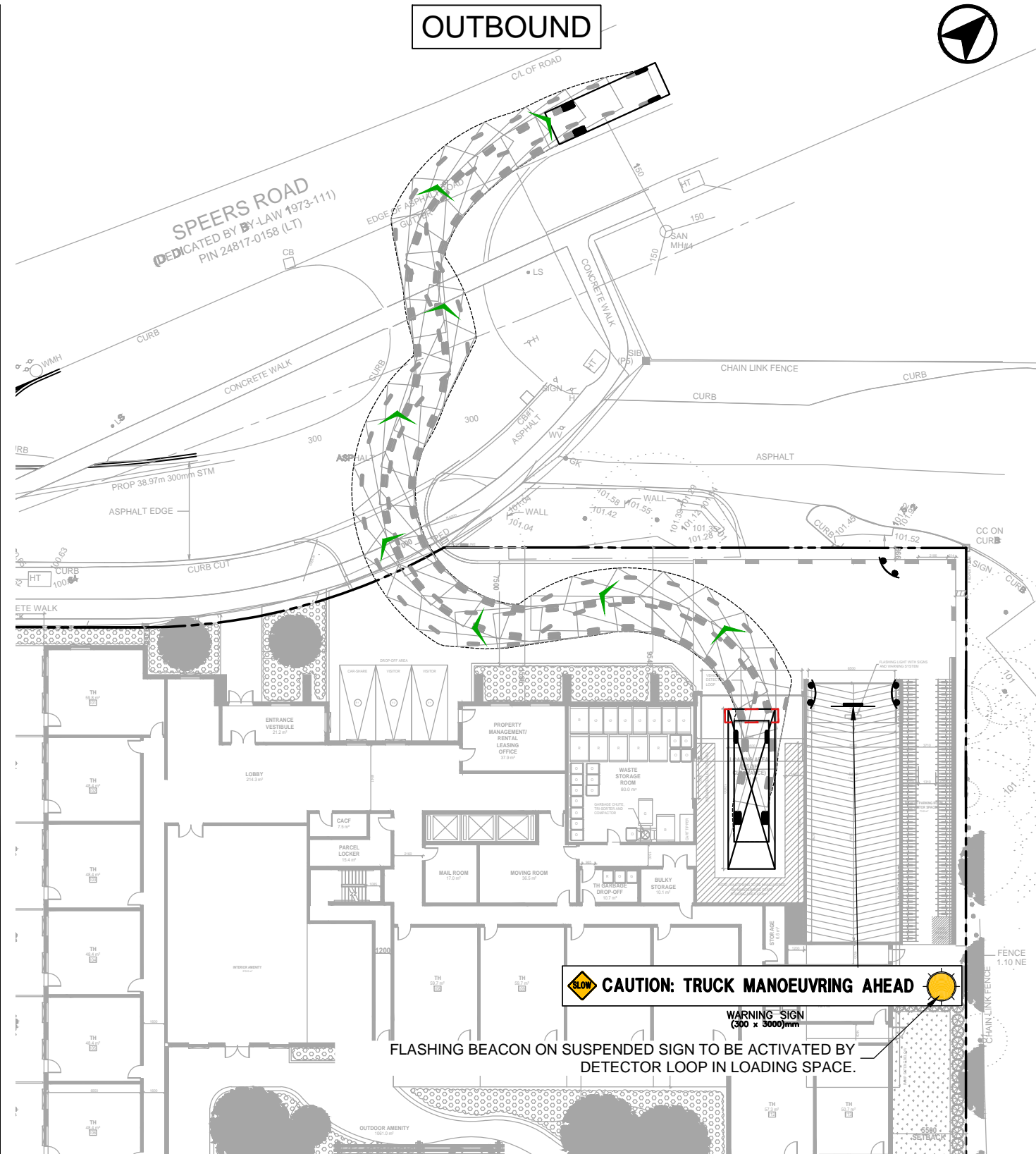
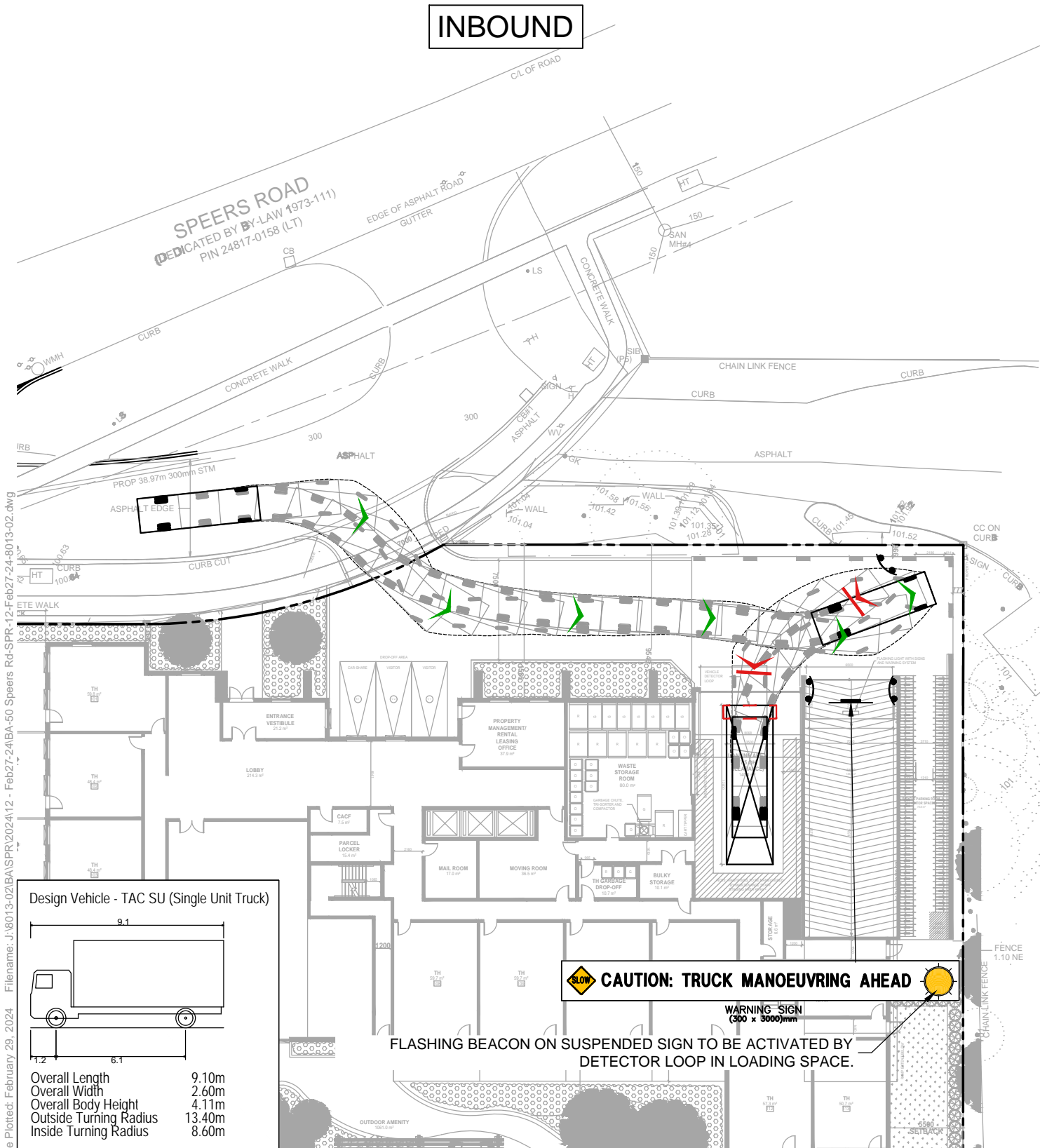
Project: 50 SPEERS ROAD
Project No. 8013-02
Date: June 7, 2022
Revised: February 29, 2024



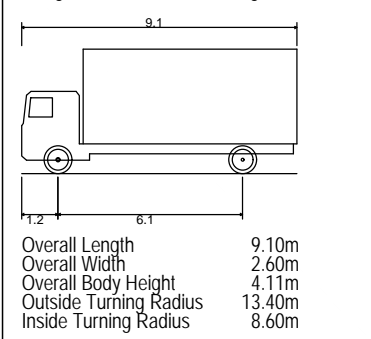
Drawing No. **VMD-02**

INBOUND

OUTBOUND



Design Vehicle - TAC SU (Single Unit Truck)



CAUTION: TRUCK MANOEUVRING AHEAD

WARNING SIGN (300 x 3000)mm

FLASHING BEACON ON SUSPENDED SIGN TO BE ACTIVATED BY DETECTOR LOOP IN LOADING SPACE.

CAUTION: TRUCK MANOEUVRING AHEAD

WARNING SIGN (300 x 3000)mm

FLASHING BEACON ON SUSPENDED SIGN TO BE ACTIVATED BY DETECTOR LOOP IN LOADING SPACE.



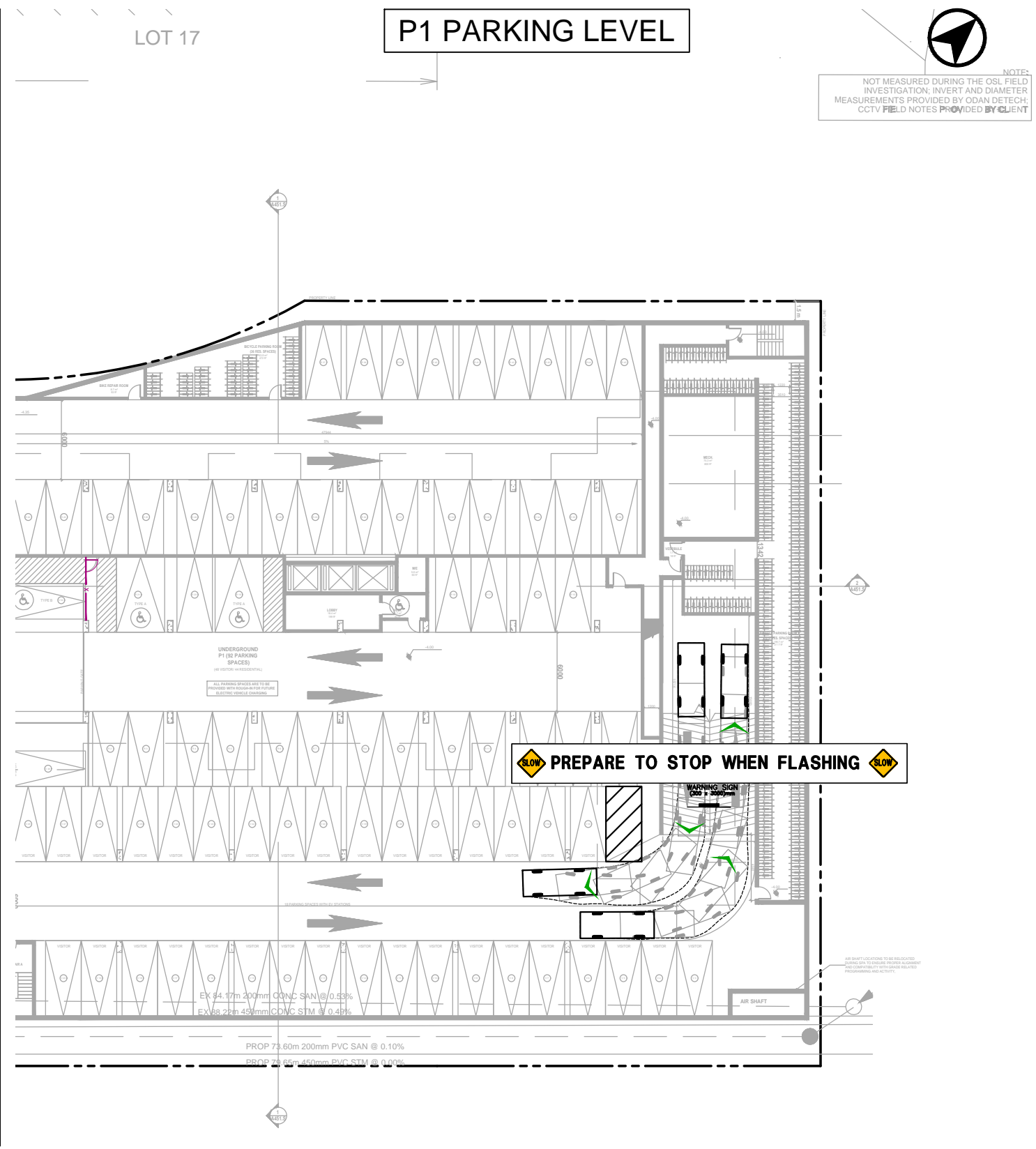
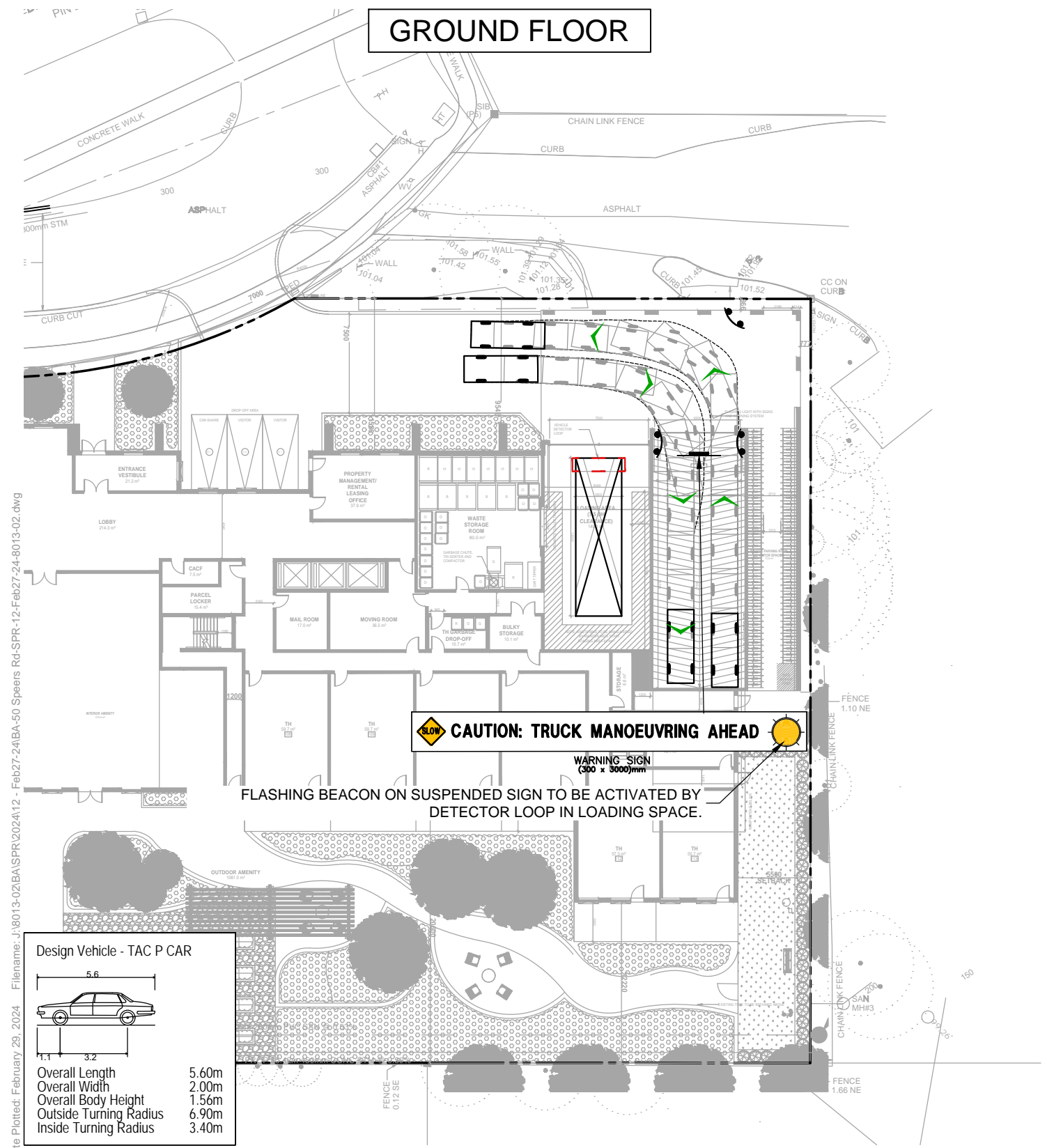
50 SPEERS ROAD
VEHICLE MANOEUVRING DIAGRAM
TAC SINGLE UNIT (SU) TRUCK

Project: 50 SPEERS ROAD
Project No. 8013-02
Date: June 7, 2022
Revised: February 29, 2024



Drawing No. **VMD-03**

Date Plotted: February 29, 2024 File name: J:\8013-02\BA\SPR\2024\12 - Feb\27-24\BA-50 Speers Rd-SPR-12-Feb27-24-8013-02.dwg



NOTE:
 NOT MEASURED DURING THE OSL FIELD INVESTIGATION; INVERT AND DIAMETER MEASUREMENTS PROVIDED BY ODAN DETECH; CCTV FIELD NOTES PROVIDED BY CLIENT

Date Plotted: February 29, 2024 File name: J:\8013-02\BA\SPR\2024\12 - Feb27-24\BA-50 Speers Rd-SPR-12-Feb27-24-8013-02.dwg

	<p align="center">50 SPEERS ROAD VEHICLE MANOEUVRING DIAGRAM GROUND FLOOR & P1 PARKING LEVEL TAC P CAR - PARKING RAMP</p>	Project: 50 SPEERS ROAD Project No. 8013-02 Date: June 7, 2022 Revised: February 29, 2024	Scale 1:400
		Drawing No. VMD-04	

Appendix D

Turning Movement Counts





Turning Movement Count (2 . SPEERS RD & CROSS AVE)

Start Time	N Approach CROSS AVE					E Approach CORNWALL RD					W Approach SPEERS RD					Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	UTurn E:E	Peds E:	Approach Total	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	15	0	0	0	15	0	43	0	0	43	61	22	0	0	83	141	
07:15:00	26	0	0	0	26	3	47	0	1	50	103	42	0	0	145	221	
07:30:00	27	1	0	1	28	2	52	0	0	54	104	47	0	0	151	233	
07:45:00	40	2	0	8	42	4	79	0	0	83	137	59	0	0	196	321	916
08:00:00	37	2	0	0	39	5	113	0	0	118	131	36	0	0	167	324	1099
08:15:00	72	1	0	2	73	6	143	0	1	149	167	66	0	0	233	455	1333
08:30:00	63	1	0	0	64	4	144	1	0	149	140	29	0	1	169	382	1482
08:45:00	48	1	0	3	49	5	135	0	1	140	139	53	0	0	192	381	1542
BREAK																	
16:00:00	98	5	0	1	103	7	180	0	2	187	156	36	2	0	194	484	
16:15:00	110	0	0	1	110	4	173	0	0	177	172	63	0	0	235	522	
16:30:00	75	5	0	2	80	4	166	0	0	170	163	58	2	0	223	473	
16:45:00	98	0	0	1	98	3	194	0	2	197	158	57	0	0	215	510	1989
17:00:00	96	2	0	2	98	4	175	0	0	179	178	56	0	0	234	511	2016
17:15:00	114	1	0	2	115	5	190	0	0	195	161	56	0	0	217	527	2021
17:30:00	75	2	0	6	77	6	158	0	0	164	158	53	1	0	212	453	2001
17:45:00	84	0	0	4	84	7	133	0	0	140	119	48	0	0	167	391	1882
Grand Total	1078	23	0	33	1101	69	2125	1	7	2195	2247	781	5	1	3033	6329	-
Approach%	97.9%	2.1%	0%	-	-	3.1%	96.8%	0%	-	-	74.1%	25.8%	0.2%	-	-	-	-
Totals %	17%	0.4%	0%	-	17.4%	1.1%	33.6%	0%	-	34.7%	35.5%	12.3%	0.1%	-	47.9%	-	-
Heavy	75	0	0	-	-	1	63	0	-	-	64	65	0	-	-	-	-
Heavy %	7%	0%	0%	-	-	1.4%	3%	0%	-	-	2.8%	8.3%	0%	-	-	-	-
Bicycles	0	0	0	-	-	0	3	0	-	-	2	0	0	-	-	-	-
Bicycle %	0%	0%	0%	-	-	0%	0.1%	0%	-	-	0.1%	0%	0%	-	-	-	-



Peak Hour: 08:00 AM - 09:00 AM Weather: Scattered Clouds (-0.83 °C)

Start Time	N Approach CROSS AVE					E Approach CORNWALL RD					W Approach SPEERS RD					Int. Total (15 min)
	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	Thru	Left	UTurn	Peds	Approach Total	
08:00:00	37	2	0	0	39	5	113	0	0	118	131	36	0	0	167	324
08:15:00	72	1	0	2	73	6	143	0	1	149	167	66	0	0	233	455
08:30:00	63	1	0	0	64	4	144	1	0	149	140	29	0	1	169	382
08:45:00	48	1	0	3	49	5	135	0	1	140	139	53	0	0	192	381
Grand Total	220	5	0	5	225	20	535	1	2	556	577	184	0	1	761	1542
Approach%	97.8%	2.2%	0%	-	-	3.6%	96.2%	0.2%	-	-	75.8%	24.2%	0%	-	-	-
Totals %	14.3%	0.3%	0%	14.6%	1.3%	34.7%	0.1%	36.1%	37.4%	11.9%	0%	49.4%	-	-	-	-
PHF	0.76	0.63	0	0.77	0.83	0.93	0.25	0.93	0.86	0.7	0	0.82	-	-	-	-
Heavy	21	0	0	21	1	24	0	25	27	14	0	41	-	-	-	-
Heavy %	9.5%	0%	0%	9.3%	5%	4.5%	0%	4.5%	4.7%	7.6%	0%	5.4%	-	-	-	-
Lights	199	5	0	204	19	511	1	531	550	170	0	720	-	-	-	-
Lights %	90.5%	100%	0%	90.7%	95%	95.5%	100%	95.5%	95.3%	92.4%	0%	94.6%	-	-	-	-
Single-Unit Trucks	3	0	0	3	1	15	0	16	16	1	0	17	-	-	-	-
Single-Unit Trucks %	1.4%	0%	0%	1.3%	5%	2.8%	0%	2.9%	2.8%	0.5%	0%	2.2%	-	-	-	-
Buses	17	0	0	17	0	7	0	7	9	13	0	22	-	-	-	-
Buses %	7.7%	0%	0%	7.6%	0%	1.3%	0%	1.3%	1.6%	7.1%	0%	2.9%	-	-	-	-
Articulated Trucks	1	0	0	1	0	2	0	2	2	0	0	2	-	-	-	-
Articulated Trucks %	0.5%	0%	0%	0.4%	0%	0.4%	0%	0.4%	0.3%	0%	0%	0.3%	-	-	-	-
Pedestrians	-	-	-	5	-	-	-	2	-	-	-	1	-	-	-	-
Pedestrians%	-	-	-	62.5%	-	-	-	25%	-	-	-	12.5%	-	-	-	-
Bicycles on Crosswalk	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	-
Bicycles on Crosswalk%	-	-	-	0%	-	-	-	0%	-	-	-	0%	-	-	-	-
Bicycles on Road	0	0	0	0	-	0	0	0	-	0	0	0	-	-	-	-
Bicycles on Road%	-	-	-	0%	-	-	-	0%	-	-	-	0%	-	-	-	-



Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (7.39 °C)

Start Time	N Approach CROSS AVE					E Approach CORNWALL RD					W Approach SPEERS RD					Int. Total (15 min)
	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	Thru	Left	UTurn	Peds	Approach Total	
16:30:00	75	5	0	2	80	4	166	0	0	170	163	58	2	0	223	473
16:45:00	98	0	0	1	98	3	194	0	2	197	158	57	0	0	215	510
17:00:00	96	2	0	2	98	4	175	0	0	179	178	56	0	0	234	511
17:15:00	114	1	0	2	115	5	190	0	0	195	161	56	0	0	217	527
Grand Total	383	8	0	7	391	16	725	0	2	741	660	227	2	0	889	2021
Approach%	98%	2%	0%	-	-	2.2%	97.8%	0%	-	-	74.2%	25.5%	0.2%	-	-	-
Totals %	19%	0.4%	0%	19.3%	0.8%	35.9%	0%	36.7%	32.7%	11.2%	0.1%	44%	-	-	-	-
PHF	0.84	0.4	0	0.85	0.8	0.93	0	0.94	0.93	0.98	0.25	0.95	-	-	-	-
Heavy	18	0	0	18	0	8	0	8	3	15	0	18	-	-	-	-
Heavy %	4.7%	0%	0%	4.6%	0%	1.1%	0%	1.1%	0.5%	6.6%	0%	2%	-	-	-	-
Lights	365	8	0	373	16	717	0	733	657	212	2	871	-	-	-	-
Lights %	95.3%	100%	0%	95.4%	100%	98.9%	0%	98.9%	99.5%	93.4%	100%	98%	-	-	-	-
Single-Unit Trucks	2	0	0	2	0	5	0	5	3	0	0	3	-	-	-	-
Single-Unit Trucks %	0.5%	0%	0%	0.5%	0%	0.7%	0%	0.7%	0.5%	0%	0%	0.3%	-	-	-	-
Buses	15	0	0	15	0	2	0	2	0	15	0	15	-	-	-	-
Buses %	3.9%	0%	0%	3.8%	0%	0.3%	0%	0.3%	0%	6.6%	0%	1.7%	-	-	-	-
Articulated Trucks	1	0	0	1	0	1	0	1	0	0	0	0	-	-	-	-
Articulated Trucks %	0.3%	0%	0%	0.3%	0%	0.1%	0%	0.1%	0%	0%	0%	0%	-	-	-	-
Pedestrians	-	-	-	5	-	-	-	2	-	-	-	0	-	-	-	-
Pedestrians%	-	-	-	55.6%	-	-	-	22.2%	-	-	-	0%	-	-	-	-
Bicycles on Crosswalk	-	-	-	2	-	-	-	0	-	-	-	0	-	-	-	-
Bicycles on Crosswalk%	-	-	-	22.2%	-	-	-	0%	-	-	-	0%	-	-	-	-
Bicycles on Road	0	0	0	0	-	0	0	0	-	1	0	0	0	-	-	-
Bicycles on Road%	-	-	-	0%	-	-	-	0%	-	-	-	0%	-	-	-	-

Peak Hour: 08:00 AM - 09:00 AM Weather: Scattered Clouds (-0.83 °C)



Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (7.39 °C)





Turning Movement Count (1 . SPEERS RD & KERR ST)

Start Time	N Approach KERR ST						E Approach SPEERS RD						S Approach KERR ST						W Approach SPEERS RD						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	7	10	20	0	1	37	11	39	18	0	1	68	26	10	16	0	0	52	16	39	2	0	0	57	214	
07:15:00	5	15	29	0	1	49	23	43	17	0	2	83	43	4	14	0	1	61	14	72	1	0	1	87	280	
07:30:00	6	17	29	0	4	52	19	34	19	0	6	72	51	6	24	0	3	81	16	61	1	0	7	78	283	
07:45:00	11	26	33	0	2	70	33	70	24	0	11	127	47	20	18	0	4	85	16	99	9	0	0	124	406	1183
08:00:00	11	23	39	0	5	73	31	83	43	0	14	157	41	16	18	0	2	75	11	80	5	0	5	96	401	1370
08:15:00	4	40	41	0	3	85	49	123	49	0	11	221	63	23	22	0	2	108	22	133	10	0	10	165	579	1669
08:30:00	18	29	40	0	5	87	55	130	38	0	4	223	45	19	15	0	3	79	26	81	7	0	6	114	503	1889
08:45:00	13	42	46	0	3	101	40	98	48	0	8	186	55	15	18	0	1	88	24	94	11	1	1	130	505	1988
BREAK																										
16:00:00	15	51	48	0	10	114	87	121	60	0	6	268	62	31	43	0	6	136	28	92	14	0	13	134	652	
16:15:00	10	66	69	0	6	145	86	159	44	0	10	289	62	34	39	0	0	135	34	109	9	0	7	152	721	
16:30:00	13	41	75	0	10	129	51	125	45	1	9	222	50	33	34	0	1	117	33	116	7	0	10	156	624	
16:45:00	20	70	60	0	3	150	89	149	61	0	5	299	52	39	27	0	2	118	23	99	12	0	5	134	701	2698
17:00:00	17	55	64	0	12	136	82	130	43	0	11	255	54	30	29	0	4	113	30	136	16	0	14	182	686	2732
17:15:00	8	60	63	0	4	131	65	178	57	0	4	300	49	44	27	0	3	120	26	110	21	0	5	157	708	2719
17:30:00	15	49	66	0	16	130	60	113	46	0	8	219	52	33	28	0	4	113	34	99	7	0	15	140	602	2697
17:45:00	12	52	47	0	9	111	63	109	57	0	6	229	50	32	22	0	6	104	36	81	10	0	6	127	571	2567
Grand Total	185	646	769	0	94	1600	844	1704	669	1	116	3218	802	389	394	0	42	1585	389	1501	142	1	105	2033	8436	-
Approach%	11.6%	40.4%	48.1%	0%	-	-	26.2%	53%	20.8%	0%	-	-	50.6%	24.5%	24.9%	0%	-	-	19.1%	73.8%	7%	0%	-	-	-	-
Totals %	2.2%	7.7%	9.1%	0%	19%	19%	10%	20.2%	7.9%	0%	38.1%	38.1%	9.5%	4.6%	4.7%	0%	18.8%	4.6%	17.8%	1.7%	0%	24.1%	-	-	-	-
Heavy	2	12	31	0	-	-	32	71	34	0	-	-	36	1	12	0	-	-	18	70	1	0	-	-	-	-
Heavy %	1.1%	1.9%	4%	0%	-	-	3.8%	4.2%	5.1%	0%	-	-	4.5%	0.3%	3%	0%	-	-	4.6%	4.7%	0.7%	0%	-	-	-	-
Bicycles	0	0	2	0	-	-	0	0	1	0	-	-	0	0	0	0	-	-	2	1	0	0	-	-	-	-
Bicycle %	0%	0%	0.3%	0%	-	-	0%	0%	0.1%	0%	-	-	0%	0%	0%	0%	-	-	0.5%	0.1%	0%	0%	-	-	-	-



Peak Hour: 08:00 AM - 09:00 AM Weather: Scattered Clouds (-0.83 °C)

Start Time	N Approach KERR ST						E Approach SPEERS RD						S Approach KERR ST						W Approach SPEERS RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:00:00	11	23	39	0	5	73	31	83	43	0	14	157	41	16	18	0	2	75	11	80	5	0	5	96	401
08:15:00	4	40	41	0	3	85	49	123	49	0	11	221	63	23	22	0	2	108	22	133	10	0	10	165	579
08:30:00	18	29	40	0	5	87	55	130	38	0	4	223	45	19	15	0	3	79	26	81	7	0	6	114	503
08:45:00	13	42	46	0	3	101	40	98	48	0	8	186	55	15	18	0	1	88	24	94	11	1	1	130	505
Grand Total	46	134	166	0	16	346	175	434	178	0	37	787	204	73	73	0	8	350	83	388	33	1	22	505	1988
Approach%	13.3%	38.7%	48%	0%	-	-	22.2%	55.1%	22.6%	0%	-	-	58.3%	20.9%	20.9%	0%	-	-	16.4%	76.8%	6.5%	0.2%	-	-	-
Totals %	2.3%	6.7%	8.4%	0%	17.4%	17.4%	8.8%	21.8%	9%	0%	39.6%	39.6%	10.3%	3.7%	3.7%	0%	17.6%	17.6%	4.2%	19.5%	1.7%	0.1%	25.4%	25.4%	-
PHF	0.64	0.8	0.9	0	0.86	0.86	0.8	0.83	0.91	0	0.88	0.88	0.81	0.79	0.83	0	0.81	0.81	0.8	0.73	0.75	0.25	0.77	0.77	-
Heavy	1	5	9	0	15	15	8	22	13	0	43	43	11	1	5	0	17	17	6	25	0	0	31	31	-
Heavy %	2.2%	3.7%	5.4%	0%	4.3%	4.3%	4.6%	5.1%	7.3%	0%	5.5%	5.5%	5.4%	1.4%	6.8%	0%	4.9%	4.9%	7.2%	6.4%	0%	0%	6.1%	6.1%	-
Lights	45	129	157	0	331	331	167	412	165	0	744	744	193	72	68	0	333	333	77	363	33	1	474	474	-
Lights %	97.8%	96.3%	94.6%	0%	95.7%	95.7%	95.4%	94.9%	92.7%	0%	94.5%	94.5%	94.6%	98.6%	93.2%	0%	95.1%	95.1%	92.8%	93.6%	100%	100%	93.9%	93.9%	-
Single-Unit Trucks	1	2	2	0	5	5	1	13	4	0	18	18	4	0	2	0	6	6	5	11	0	0	16	16	-
Single-Unit Trucks %	2.2%	1.5%	1.2%	0%	1.4%	1.4%	0.6%	3%	2.2%	0%	2.3%	2.3%	2%	0%	2.7%	0%	1.7%	1.7%	6%	2.8%	0%	0%	3.2%	3.2%	-
Buses	0	2	7	0	9	9	7	8	9	0	24	24	7	0	3	0	10	10	1	12	0	0	13	13	-
Buses %	0%	1.5%	4.2%	0%	2.6%	2.6%	4%	1.8%	5.1%	0%	3%	3%	3.4%	0%	4.1%	0%	2.9%	2.9%	1.2%	3.1%	0%	0%	2.6%	2.6%	-
Articulated Trucks	0	1	0	0	1	1	0	1	0	0	1	1	0	1	0	0	1	1	0	2	0	0	2	2	-
Articulated Trucks %	0%	0.7%	0%	0%	0.3%	0.3%	0%	0.2%	0%	0%	0.1%	0.1%	0%	1.4%	0%	0%	0.3%	0.3%	0%	0.5%	0%	0%	0.4%	0.4%	-
Pedestrians	-	-	-	-	14	14	-	-	-	-	37	37	-	-	-	-	8	8	-	-	-	-	20	20	-
Pedestrians%	-	-	-	-	16.9%	16.9%	-	-	-	-	44.6%	44.6%	-	-	-	-	9.6%	9.6%	-	-	-	-	24.1%	24.1%	-
Bicycles on Crosswalk	-	-	-	-	2	2	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-	2	2	-
Bicycles on Crosswalk%	-	-	-	-	2.4%	2.4%	-	-	-	-	0%	0%	-	-	-	-	0%	0%	-	-	-	-	2.4%	2.4%	-
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	-
Bicycles on Road%	-	-	-	-	0%	0%	-	-	-	-	0%	0%	-	-	-	-	0%	0%	-	-	-	-	0%	0%	-



Peak Hour: 04:15 PM - 05:15 PM Weather: Overcast Clouds (7.39 °C)

Start Time	N Approach KERR ST						E Approach SPEERS RD						S Approach KERR ST						W Approach SPEERS RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:15:00	10	66	69	0	6	145	86	159	44	0	10	289	62	34	39	0	0	135	34	109	9	0	7	152	721
16:30:00	13	41	75	0	10	129	51	125	45	1	9	222	50	33	34	0	1	117	33	116	7	0	10	156	624
16:45:00	20	70	60	0	3	150	89	149	61	0	5	299	52	39	27	0	2	118	23	99	12	0	5	134	701
17:00:00	17	55	64	0	12	136	82	130	43	0	11	255	54	30	29	0	4	113	30	136	16	0	14	182	686
Grand Total	60	232	268	0	31	560	308	563	193	1	35	1065	218	136	129	0	7	483	120	460	44	0	36	624	2732
Approach%	10.7%	41.4%	47.9%	0%	-	-	28.9%	52.9%	18.1%	0.1%	-	-	45.1%	28.2%	26.7%	0%	-	-	19.2%	73.7%	7.1%	0%	-	-	-
Totals %	2.2%	8.5%	9.8%	0%	20.5%	11.3%	20.6%	7.1%	0%	39%	8%	5%	4.7%	0%	17.7%	4.4%	16.8%	1.6%	0%	22.8%	-	-	-	-	-
PHF	0.75	0.83	0.89	0	0.93	0.87	0.89	0.79	0.25	0.89	0.88	0.87	0.83	0	0.89	0.88	0.85	0.69	0	0.86	-	-	-	-	-
Heavy	0	2	5	0	7	8	15	6	0	29	3	0	2	0	5	1	9	0	0	10	-	-	-	-	-
Heavy %	0%	0.9%	1.9%	0%	1.3%	2.6%	2.7%	3.1%	0%	2.7%	1.4%	0%	1.6%	0%	1%	0.8%	2%	0%	0%	1.6%	-	-	-	-	-
Lights	60	230	263	0	553	300	548	187	1	1036	215	136	127	0	478	119	451	44	0	614	-	-	-	-	-
Lights %	100%	99.1%	98.1%	0%	98.8%	97.4%	97.3%	96.9%	100%	97.3%	98.6%	100%	98.4%	0%	99%	99.2%	98%	100%	0%	98.4%	-	-	-	-	-
Single-Unit Trucks	0	2	0	0	2	1	6	2	0	9	1	0	2	0	3	0	2	0	0	2	-	-	-	-	-
Single-Unit Trucks %	0%	0.9%	0%	0%	0.4%	0.3%	1.1%	1%	0%	0.8%	0.5%	0%	1.6%	0%	0.6%	0%	0.4%	0%	0%	0.3%	-	-	-	-	-
Buses	0	0	5	0	5	7	7	4	0	18	2	0	0	0	2	1	7	0	0	8	-	-	-	-	-
Buses %	0%	0%	1.9%	0%	0.9%	2.3%	1.2%	2.1%	0%	1.7%	0.9%	0%	0%	0%	0.4%	0.8%	1.5%	0%	0%	1.3%	-	-	-	-	-
Articulated Trucks	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	-	-	-	-	-
Articulated Trucks %	0%	0%	0%	0%	0%	0%	0.4%	0%	0%	0.2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	-	-	-	-
Pedestrians	-	-	-	-	30	-	-	-	-	35	-	-	-	-	7	-	-	-	-	34	-	-	-	-	-
Pedestrians%	-	-	-	-	27.5%	-	-	-	-	32.1%	-	-	-	-	6.4%	-	-	-	-	31.2%	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	0	-	-	-	-	0	-	-	-	-	2	-	-	-	-	-
Bicycles on Crosswalk%	-	-	-	-	0.9%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	1.8%	-	-	-	-	-
Bicycles on Road	0	0	1	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	-	-	-	-
Bicycles on Road%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-

Peak Hour: 08:00 AM - 09:00 AM Weather: Scattered Clouds (-0.83 °C)



Peak Hour: 04:15 PM - 05:15 PM Weather: Overcast Clouds (7.39 °C)



mapbox

© Mapbox, © OpenStreetMap



Turning Movement Count (3 . SPEERS RD & ST. AUGUSTINE DR)

Start Time	N Approach NORTH DRIVEWAY						E Approach SPEERS RD						S Approach ST AUGUSTINE DR						W Approach SPEERS RD						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	0	0	0	0	1	0	1	49	0	0	0	50	1	0	0	0	0	1	1	59	1	0	0	61	112	
07:15:00	0	0	0	0	0	0	2	61	0	0	0	63	3	0	1	0	1	4	2	94	3	0	0	99	166	
07:30:00	0	0	0	0	0	0	2	73	1	0	1	76	2	0	2	0	1	4	3	80	1	0	2	84	164	
07:45:00	0	0	1	0	2	1	4	101	0	0	1	105	9	0	3	0	2	12	6	116	1	0	1	123	241	683
08:00:00	0	0	0	0	1	0	3	114	0	0	0	117	4	0	1	0	1	5	4	108	0	0	0	112	234	805
08:15:00	0	0	0	0	0	0	2	127	0	0	0	129	4	0	0	0	3	4	2	164	0	0	0	166	299	938
08:30:00	1	0	0	0	1	1	3	177	0	0	0	180	6	0	1	0	1	7	6	122	2	0	0	130	318	1092
08:45:00	0	0	0	0	1	0	9	121	0	0	0	130	4	0	1	0	0	5	1	129	1	0	0	131	266	1117
BREAK																										
16:00:00	4	0	3	0	2	7	5	190	1	0	2	196	14	0	0	0	2	14	3	125	2	0	0	130	347	
16:15:00	7	0	1	0	3	8	2	195	1	0	0	198	5	1	0	0	1	6	11	165	0	0	0	176	388	
16:30:00	0	0	0	0	0	0	1	189	0	0	0	190	5	0	0	0	1	5	8	167	2	0	0	177	372	
16:45:00	6	0	1	0	0	7	1	202	1	0	0	204	7	1	1	0	1	9	4	149	6	1	1	160	380	1487
17:00:00	1	0	1	0	7	2	3	179	0	0	1	182	10	0	2	0	3	12	11	176	0	0	0	187	383	1523
17:15:00	3	0	5	0	1	8	3	201	0	0	1	204	3	1	0	0	0	4	2	181	1	0	0	184	400	1535
17:30:00	1	0	3	0	1	4	1	187	0	0	0	188	6	0	1	0	0	7	11	126	0	0	0	137	336	1499
17:45:00	3	0	3	0	1	6	0	133	0	0	1	133	6	0	0	0	2	6	1	129	1	0	0	131	276	1395
Grand Total	26	0	18	0	21	44	42	2299	4	0	7	2345	89	3	13	0	19	105	76	2090	21	1	4	2188	4682	-
Approach%	59.1%	0%	40.9%	0%	-	-	1.8%	98%	0.2%	0%	-	-	84.8%	2.9%	12.4%	0%	-	-	3.5%	95.5%	1%	0%	-	-	-	
Totals %	0.6%	0%	0.4%	0%	0.9%	0.9%	49.1%	0.1%	0%	50.1%	1.9%	0.1%	0.3%	0%	2.2%	1.6%	44.6%	0.4%	0%	46.7%	-	-	-	-	-	
Heavy	0	0	0	0	-	2	88	0	0	-	5	0	1	0	-	3	86	0	0	-	-	-	-	-	-	
Heavy %	0%	0%	0%	0%	-	4.8%	3.8%	0%	0%	-	5.6%	0%	7.7%	0%	-	3.9%	4.1%	0%	0%	-	-	-	-	-	-	
Bicycles	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	1	1	0	0	-	-	-	-	-	-	
Bicycle %	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	1.3%	0%	0%	0%	-	-	-	-	-	-	



Peak Hour: 08:00 AM - 09:00 AM Weather: Scattered Clouds (-0.83 °C)

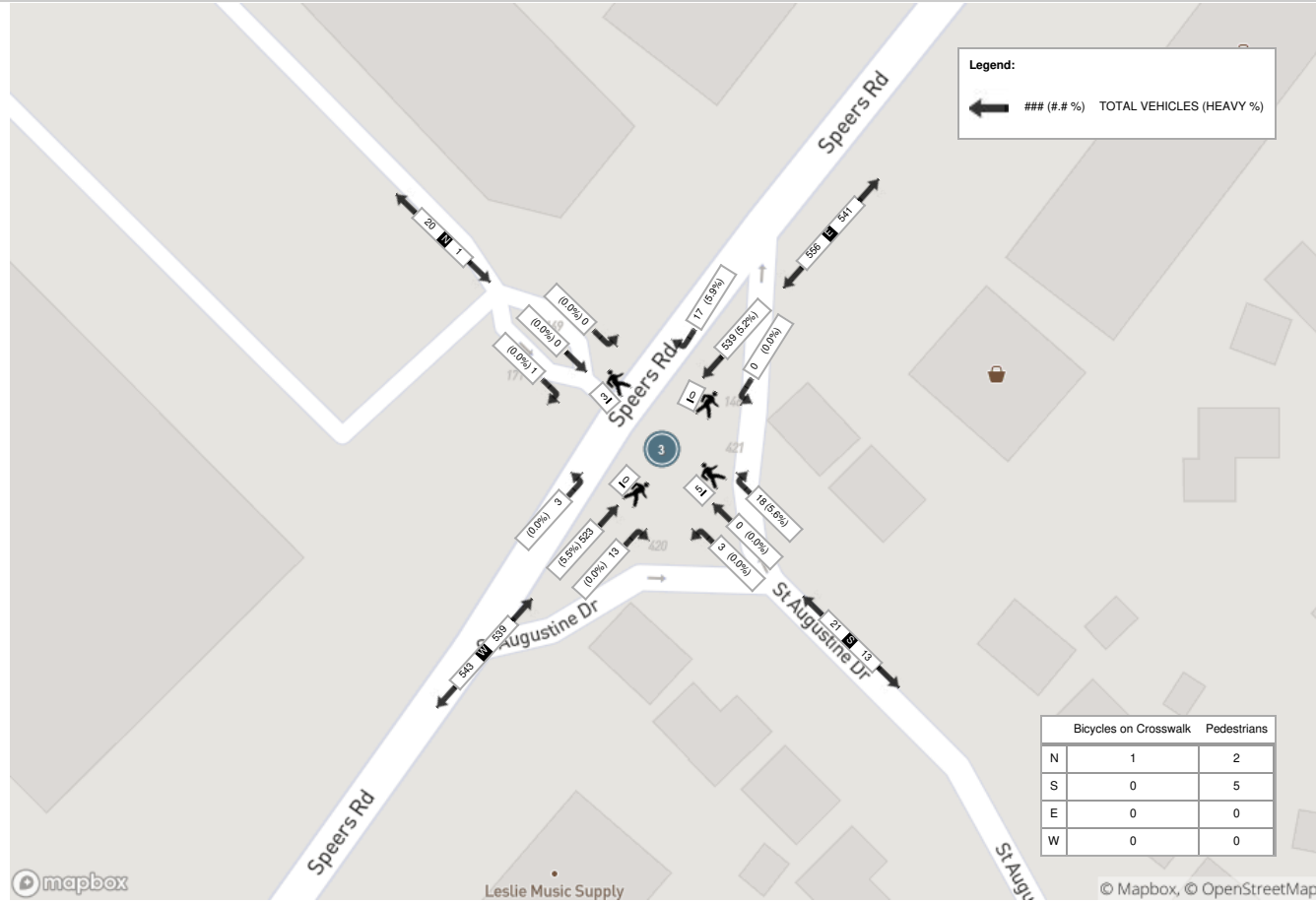
Start Time	N Approach NORTH DRIVEWAY						E Approach SPEERS RD						S Approach ST AUGUSTINE DR						W Approach SPEERS RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:00:00	0	0	0	0	1	0	3	114	0	0	0	117	4	0	1	0	1	5	4	108	0	0	0	112	234
08:15:00	0	0	0	0	0	0	2	127	0	0	0	129	4	0	0	0	3	4	2	164	0	0	0	166	299
08:30:00	1	0	0	0	1	1	3	177	0	0	0	180	6	0	1	0	1	7	6	122	2	0	0	130	318
08:45:00	0	0	0	0	1	0	9	121	0	0	0	130	4	0	1	0	0	5	1	129	1	0	0	131	266
Grand Total	1	0	0	0	3	1	17	539	0	0	0	556	18	0	3	0	5	21	13	523	3	0	0	539	1117
Approach%	100%	0%	0%	0%	-	-	3.1%	96.9%	0%	0%	-	-	85.7%	0%	14.3%	0%	-	-	2.4%	97%	0.6%	0%	-	-	-
Totals %	0.1%	0%	0%	0%	0.1%	0.1%	1.5%	48.3%	0%	0%	49.8%	49.8%	1.6%	0%	0.3%	0%	1.9%	1.9%	1.2%	46.8%	0.3%	0%	48.3%	48.3%	-
PHF	0.25	0	0	0	0	0.25	0.47	0.76	0	0	0.77	0.77	0.75	0	0.75	0	0.75	0.75	0.54	0.8	0.38	0	0.81	0.81	-
Heavy	0	0	0	0	0	0	1	28	0	0	0	29	1	0	0	0	0	1	0	29	0	0	0	29	-
Heavy %	0%	0%	0%	0%	0%	0%	5.9%	5.2%	0%	0%	5.2%	5.2%	5.6%	0%	0%	0%	4.8%	4.8%	0%	5.5%	0%	0%	5.4%	5.4%	-
Lights	1	0	0	0	0	1	16	511	0	0	0	527	17	0	3	0	0	20	13	494	3	0	0	510	-
Lights %	100%	0%	0%	0%	0%	100%	94.1%	94.8%	0%	0%	94.8%	94.8%	94.4%	0%	100%	0%	95.2%	95.2%	100%	94.5%	100%	0%	94.6%	94.6%	-
Single-Unit Trucks	0	0	0	0	0	0	1	16	0	0	0	17	0	0	0	0	0	0	0	14	0	0	0	14	-
Single-Unit Trucks %	0%	0%	0%	0%	0%	0%	5.9%	3%	0%	0%	3.1%	3.1%	0%	0%	0%	0%	0%	0%	0%	2.7%	0%	0%	2.6%	2.6%	-
Buses	0	0	0	0	0	0	0	11	0	0	0	11	1	0	0	0	0	1	0	12	0	0	0	12	-
Buses %	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	2%	2%	5.6%	0%	0%	0%	4.8%	4.8%	0%	2.3%	0%	0%	2.2%	2.2%	-
Articulated Trucks	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	3	0	0	0	3	-
Articulated Trucks %	0%	0%	0%	0%	0%	0%	0%	0.2%	0%	0%	0.2%	0.2%	0%	0%	0%	0%	0%	0%	0%	0.6%	0%	0%	0.6%	0.6%	-
Pedestrians	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	5	-	-	-	-	-	0	-	-
Pedestrians%	-	-	-	-	25%	-	-	-	-	-	0%	-	-	-	-	-	62.5%	-	-	-	-	-	0%	-	-
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	-	12.5%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	0	-	-
Bicycles on Road%	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-



Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (7.39 °C)

Start Time	N Approach NORTH DRIVEWAY						E Approach SPEERS RD						S Approach ST AUGUSTINE DR						W Approach SPEERS RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:30:00	0	0	0	0	0	0	1	189	0	0	0	190	5	0	0	0	1	5	8	167	2	0	0	177	372
16:45:00	6	0	1	0	0	7	1	202	1	0	0	204	7	1	1	0	1	9	4	149	6	1	1	160	380
17:00:00	1	0	1	0	7	2	3	179	0	0	1	182	10	0	2	0	3	12	11	176	0	0	0	187	383
17:15:00	3	0	5	0	1	8	3	201	0	0	1	204	3	1	0	0	0	4	2	181	1	0	0	184	400
Grand Total	10	0	7	0	8	17	8	771	1	0	2	780	25	2	3	0	5	30	25	673	9	1	1	708	1535
Approach%	58.8%	0%	41.2%	0%	-	-	1%	98.8%	0.1%	0%	-	-	83.3%	6.7%	10%	0%	-	-	3.5%	95.1%	1.3%	0.1%	-	-	-
Totals %	0.7%	0%	0.5%	0%	1.1%	1.1%	0.5%	50.2%	0.1%	0%	0%	50.8%	1.6%	0.1%	0.2%	0%	2%	2%	1.6%	43.8%	0.6%	0.1%	46.1%	-	-
PHF	0.42	0	0.35	0	0.53	0.53	0.67	0.95	0.25	0	0	0.96	0.63	0.5	0.38	0	0.63	0.63	0.57	0.93	0.38	0.25	0.95	-	0.95
Heavy	0	0	0	0	0	0	0	15	0	0	0	15	0	0	0	0	0	0	1	10	0	0	0	11	-
Heavy %	0%	0%	0%	0%	0%	0%	0%	1.9%	0%	0%	0%	1.9%	0%	0%	0%	0%	0%	0%	4%	1.5%	0%	0%	0%	1.6%	-
Lights	10	0	7	0	0	17	8	756	1	0	0	765	25	2	3	0	0	30	24	663	9	1	0	697	-
Lights %	100%	0%	100%	0%	0%	100%	100%	98.1%	100%	0%	0%	98.1%	100%	100%	100%	0%	0%	100%	96%	98.5%	100%	100%	0%	98.4%	-
Single-Unit Trucks	0	0	0	0	0	0	0	8	0	0	0	8	0	0	0	0	0	0	1	3	0	0	0	4	-
Single-Unit Trucks %	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	4%	0.4%	0%	0%	0%	0.6%	-
Buses	0	0	0	0	0	0	0	5	0	0	0	5	0	0	0	0	0	0	0	6	0	0	0	6	-
Buses %	0%	0%	0%	0%	0%	0%	0%	0.6%	0%	0%	0%	0.6%	0%	0%	0%	0%	0%	0%	0%	0.9%	0%	0%	0%	0.8%	-
Articulated Trucks	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	1	-
Articulated Trucks %	0%	0%	0%	0%	0%	0%	0%	0.3%	0%	0%	0%	0.3%	0%	0%	0%	0%	0%	0%	0%	0.1%	0%	0%	0%	0.1%	-
Pedestrians	-	-	-	-	8	-	-	-	-	1	-	-	-	-	-	5	-	-	-	-	-	-	1	-	-
Pedestrians%	-	-	-	-	50%	-	-	-	-	6.3%	-	-	-	-	-	31.3%	-	-	-	-	-	-	6.3%	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	-	0%	-	-	-	-	6.3%	-	-	-	-	-	0%	-	-	-	-	-	-	0%	-	-
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	1	0	0	0	0	-	-
Bicycles on Road%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	-	0%	-	-

Peak Hour: 08:00 AM - 09:00 AM Weather: Scattered Clouds (-0.83 °C)

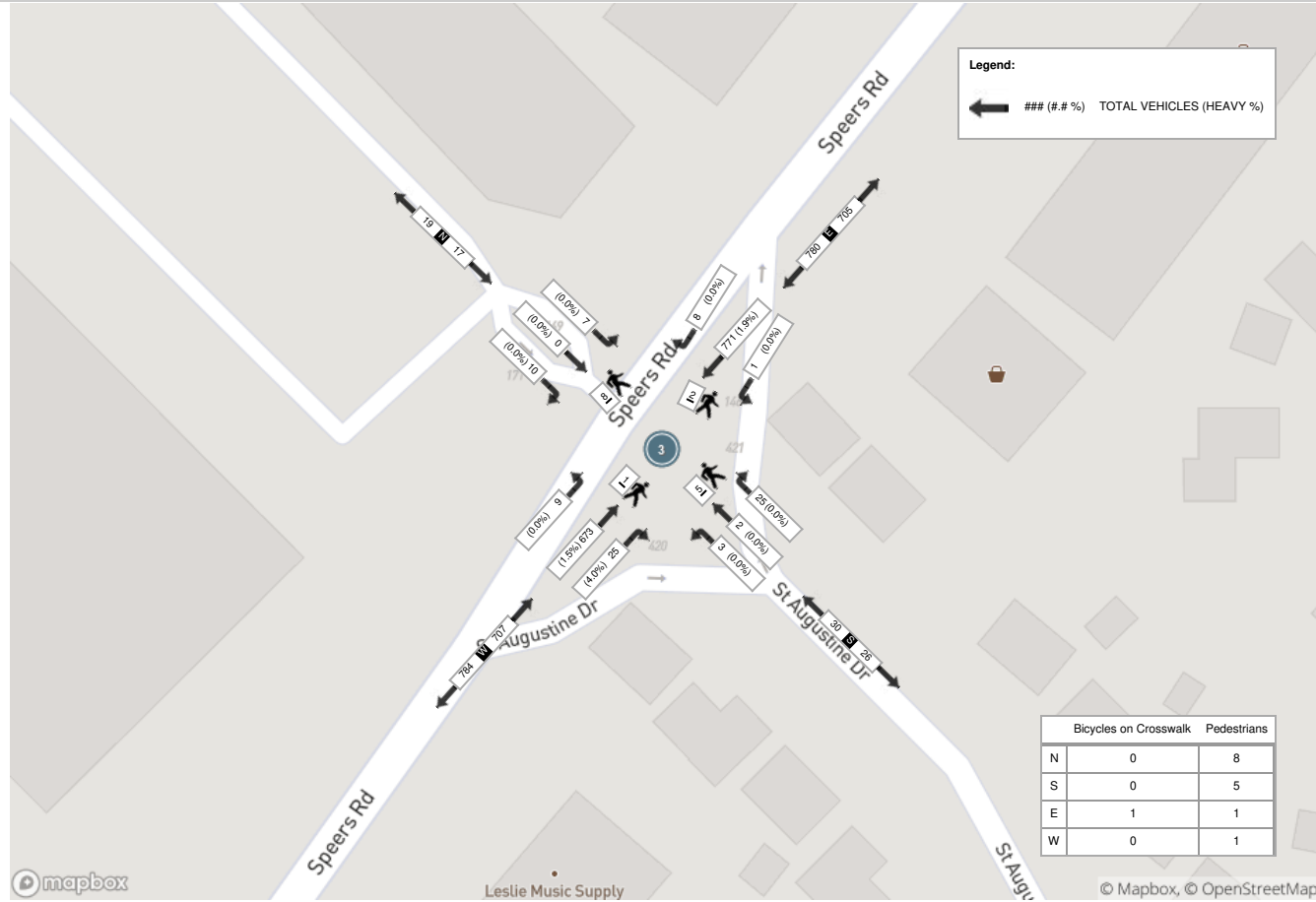


mapbox

Leslie Music Supply

© Mapbox, © OpenStreetMap

Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (7.39 °C)



mapbox

Leslie Music Supply

© Mapbox, © OpenStreetMap



Turning Movement Count (7 . ELMWOOD RD & KERR ST)

Start Time	N Approach KERR ST					S Approach KERR ST					W Approach ELMWOOD RD					Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	UTurn N:N	Peds N:	Approach Total	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	1	35	0	0	36	39	0	0	2	39	1	1	0	1	2	77	
07:15:00	1	31	0	0	32	43	1	0	0	44	3	7	0	1	10	86	
07:30:00	6	40	0	1	46	74	0	0	3	74	3	3	0	4	6	126	
07:45:00	4	52	0	0	56	66	1	0	2	67	1	4	0	3	5	128	417
08:00:00	7	62	0	1	69	56	1	0	2	57	0	4	0	3	4	130	470
08:15:00	7	88	0	0	95	86	3	0	0	89	4	7	0	8	11	195	579
08:30:00	6	76	0	0	82	65	1	0	1	66	2	5	0	2	7	155	608
08:45:00	12	84	0	0	96	77	2	0	1	79	2	4	0	5	6	181	661
BREAK																	
16:00:00	11	115	0	0	126	130	1	0	1	131	2	1	0	7	3	260	
16:15:00	9	130	0	0	139	117	0	0	0	117	2	4	0	7	6	262	
16:30:00	11	97	0	1	108	109	3	0	0	112	4	5	0	10	9	229	
16:45:00	11	128	0	0	139	97	1	0	1	98	2	4	0	11	6	243	994
17:00:00	9	110	1	0	120	104	1	0	0	105	3	3	0	5	6	231	965
17:15:00	17	111	0	0	128	115	3	0	1	118	1	5	0	6	6	252	955
17:30:00	8	115	0	1	123	102	4	0	2	106	3	3	0	4	6	235	961
17:45:00	14	115	0	0	129	91	1	0	2	92	4	4	0	8	8	229	947
Grand Total	134	1389	1	4	1524	1371	23	0	18	1394	37	64	0	85	101	3019	-
Approach%	8.8%	91.1%	0.1%	-	-	98.4%	1.6%	0%	-	-	36.6%	63.4%	0%	-	-	-	-
Totals %	4.4%	46%	0%	-	50.5%	45.4%	0.8%	0%	-	46.2%	1.2%	2.1%	0%	-	3.3%	-	-
Heavy	5	52	0	-	-	46	3	0	-	-	3	0	0	-	-	-	-
Heavy %	3.7%	3.7%	0%	-	-	3.4%	13%	0%	-	-	8.1%	0%	0%	-	-	-	-
Bicycles	1	1	0	-	-	0	0	0	-	-	0	0	0	-	-	-	-
Bicycle %	0.7%	0.1%	0%	-	-	0%	0%	0%	-	-	0%	0%	0%	-	-	-	-



Peak Hour: 08:00 AM - 09:00 AM Weather: Scattered Clouds (-0.83 °C)

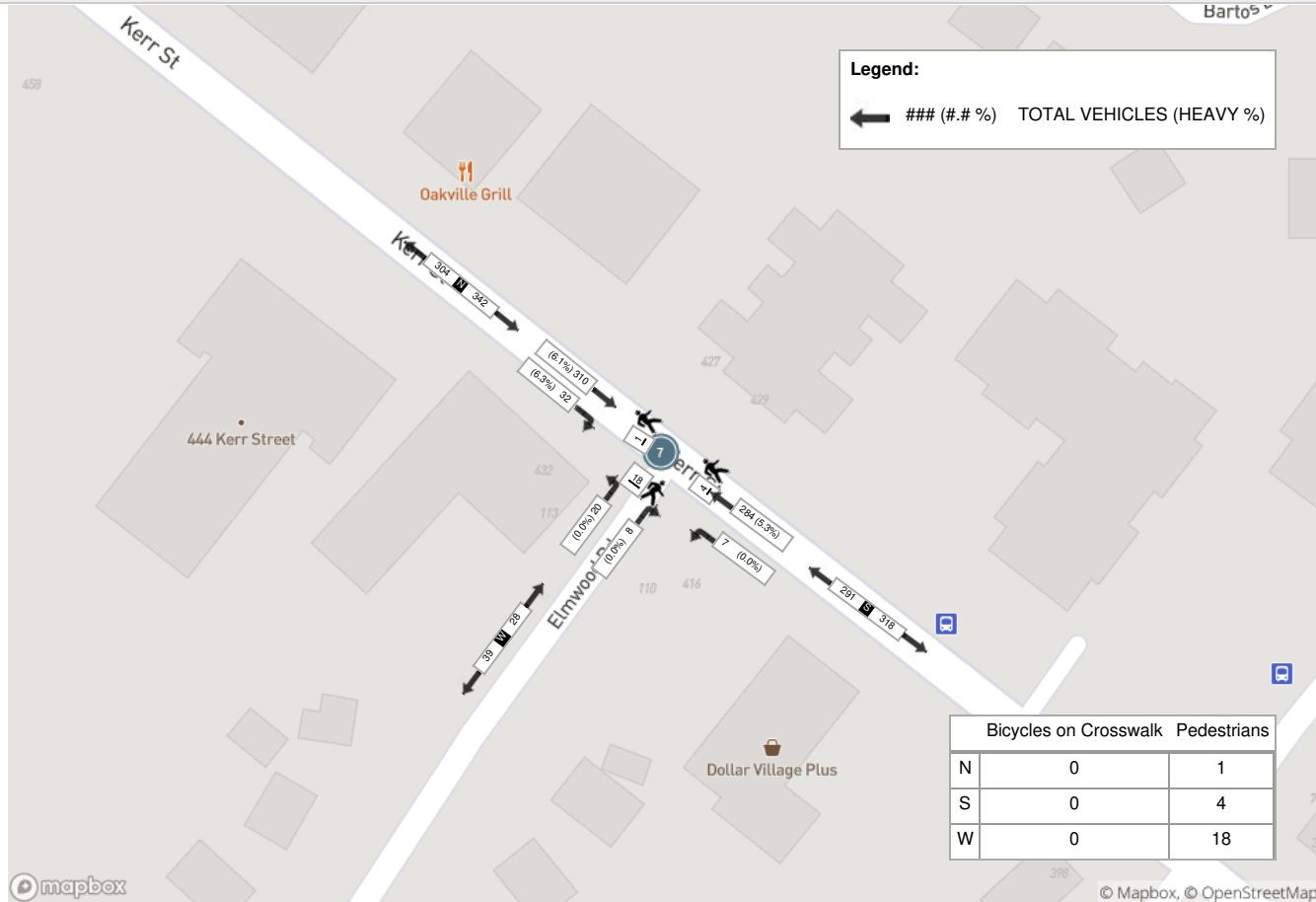
Start Time	N Approach KERR ST					S Approach KERR ST					W Approach ELMWOOD RD					Int. Total (15 min)
	Right	Thru	UTurn	Peds	Approach Total	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	
08:00:00	7	62	0	1	69	56	1	0	2	57	0	4	0	3	4	130
08:15:00	7	88	0	0	95	86	3	0	0	89	4	7	0	8	11	195
08:30:00	6	76	0	0	82	65	1	0	1	66	2	5	0	2	7	155
08:45:00	12	84	0	0	96	77	2	0	1	79	2	4	0	5	6	181
Grand Total	32	310	0	1	342	284	7	0	4	291	8	20	0	18	28	661
Approach%	9.4%	90.6%	0%	-	-	97.6%	2.4%	0%	-	-	28.6%	71.4%	0%	-	-	-
Totals %	4.8%	46.9%	0%	-	51.7%	43%	1.1%	0%	-	44%	1.2%	3%	0%	-	4.2%	-
PHF	0.67	0.88	0	-	0.89	0.83	0.58	0	-	0.82	0.5	0.71	0	-	0.64	-
Heavy	2	19	0	-	21	15	0	0	-	15	0	0	0	-	0	-
Heavy %	6.3%	6.1%	0%	-	6.1%	5.3%	0%	0%	-	5.2%	0%	0%	0%	-	0%	-
Lights	30	291	0	-	321	269	7	0	-	276	8	20	0	-	28	-
Lights %	93.8%	93.9%	0%	-	93.9%	94.7%	100%	0%	-	94.8%	100%	100%	0%	-	100%	-
Single-Unit Trucks	0	8	0	-	8	7	0	0	-	7	0	0	0	-	0	-
Single-Unit Trucks %	0%	2.6%	0%	-	2.3%	2.5%	0%	0%	-	2.4%	0%	0%	0%	-	0%	-
Buses	2	10	0	-	12	8	0	0	-	8	0	0	0	-	0	-
Buses %	6.3%	3.2%	0%	-	3.5%	2.8%	0%	0%	-	2.7%	0%	0%	0%	-	0%	-
Articulated Trucks	0	1	0	-	1	0	0	0	-	0	0	0	0	-	0	-
Articulated Trucks %	0%	0.3%	0%	-	0.3%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	-
Pedestrians	-	-	-	1	-	-	-	4	-	-	-	-	-	18	-	-
Pedestrians%	-	-	-	4.3%	-	-	-	17.4%	-	-	-	-	-	78.3%	-	-
Bicycles on Crosswalk	-	-	-	0	-	-	-	0	-	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	0%	-	-	-	0%	-	-	-	-	-	0%	-	-
Bicycles on Road	0	1	0	0	-	0	0	0	0	-	0	0	0	0	-	-
Bicycles on Road%	-	-	-	0%	-	-	-	0%	-	-	-	-	-	0%	-	-



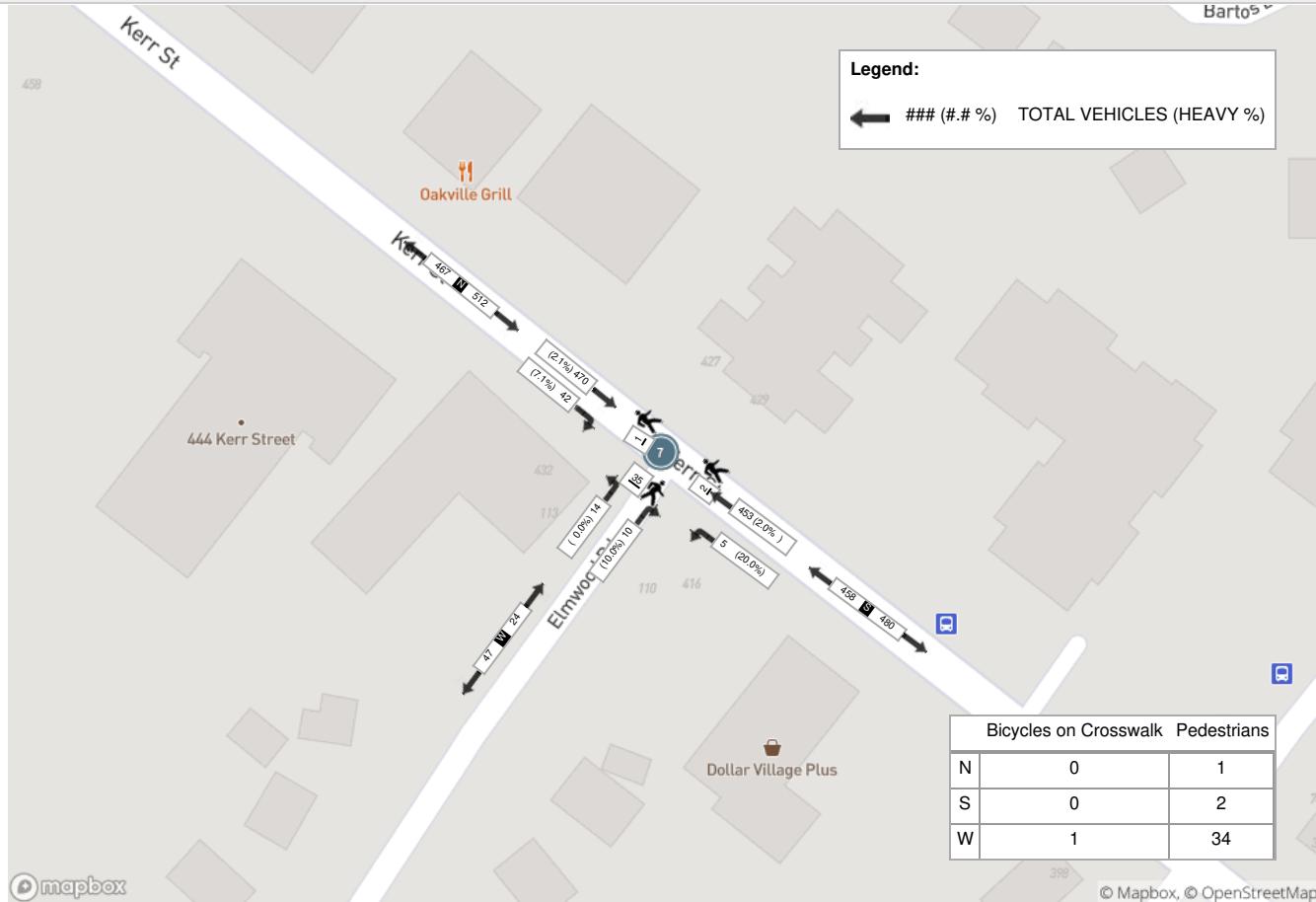
Peak Hour: 04:00 PM - 05:00 PM Weather: Overcast Clouds (7.39 °C)

Start Time	N Approach KERR ST					S Approach KERR ST					W Approach ELMWOOD RD					Int. Total (15 min)
	Right	Thru	UTurn	Peds	Approach Total	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	
16:00:00	11	115	0	0	126	130	1	0	1	131	2	1	0	7	3	260
16:15:00	9	130	0	0	139	117	0	0	0	117	2	4	0	7	6	262
16:30:00	11	97	0	1	108	109	3	0	0	112	4	5	0	10	9	229
16:45:00	11	128	0	0	139	97	1	0	1	98	2	4	0	11	6	243
Grand Total	42	470	0	1	512	453	5	0	2	458	10	14	0	35	24	994
Approach%	8.2%	91.8%	0%	-	-	98.9%	1.1%	0%	-	-	41.7%	58.3%	0%	-	-	-
Totals %	4.2%	47.3%	0%	-	51.5%	45.6%	0.5%	0%	-	46.1%	1%	1.4%	0%	-	2.4%	-
PHF	0.95	0.9	0	-	0.92	0.87	0.42	0	-	0.87	0.63	0.7	0	-	0.67	-
Heavy	3	10	0	-	13	9	1	0	-	10	1	0	0	-	1	-
Heavy %	7.1%	2.1%	0%	-	2.5%	2%	20%	0%	-	2.2%	10%	0%	0%	-	4.2%	-
Lights	39	460	0	-	499	444	4	0	-	448	9	14	0	-	23	-
Lights %	92.9%	97.9%	0%	-	97.5%	98%	80%	0%	-	97.8%	90%	100%	0%	-	95.8%	-
Single-Unit Trucks	1	4	0	-	5	6	1	0	-	7	0	0	0	-	0	-
Single-Unit Trucks %	2.4%	0.9%	0%	-	1%	1.3%	20%	0%	-	1.5%	0%	0%	0%	-	0%	-
Buses	2	6	0	-	8	3	0	0	-	3	1	0	0	-	1	-
Buses %	4.8%	1.3%	0%	-	1.6%	0.7%	0%	0%	-	0.7%	10%	0%	0%	-	4.2%	-
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	-
Articulated Trucks %	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	-
Pedestrians	-	-	-	1	-	-	-	-	2	-	-	-	-	34	-	-
Pedestrians%	-	-	-	2.6%	-	-	-	-	5.3%	-	-	-	-	89.5%	-	-
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-
Bicycles on Crosswalk%	-	-	-	0%	-	-	-	-	0%	-	-	-	-	2.6%	-	-
Bicycles on Road	1	0	0	0	-	0	0	0	0	-	0	0	0	0	-	-
Bicycles on Road%	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-

Peak Hour: 08:00 AM - 09:00 AM Weather: Scattered Clouds (-0.83 °C)



Peak Hour: 04:00 PM - 05:00 PM Weather: Overcast Clouds (7.39 °C)





Turning Movement Count (6 . PRINCE CHARLES DR & KERR ST)

Start Time	N Approach KERR ST						E Approach PRINCE CHARLES DR						S Approach KERR ST						W Approach PRINCE CHARLES DR						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	2	34	8	0	0	44	2	0	0	0	1	2	0	41	0	0	0	41	0	0	3	0	0	3	90	
07:15:00	0	35	12	0	1	47	5	0	1	0	3	6	0	53	0	0	0	53	1	0	4	0	3	5	111	
07:30:00	0	46	5	0	2	51	7	0	0	0	4	7	2	83	1	0	2	86	0	0	1	0	4	1	145	
07:45:00	0	55	15	0	1	70	7	0	2	0	14	9	1	69	0	0	4	70	1	0	6	0	1	7	156	502
08:00:00	2	63	10	0	0	75	16	1	4	0	13	21	0	66	0	0	0	66	1	0	1	0	3	2	164	576
08:15:00	2	99	11	0	1	112	12	0	1	0	4	13	3	93	2	0	0	98	2	0	1	0	5	3	226	691
08:30:00	1	80	9	0	0	90	6	0	0	0	6	6	0	67	2	0	0	69	0	0	1	0	7	1	166	712
08:45:00	2	97	9	0	0	108	6	0	0	0	7	6	2	80	2	0	1	84	0	0	2	0	1	2	200	756
BREAK																										
16:00:00	8	129	8	0	0	145	7	0	5	0	6	12	0	125	2	0	0	127	0	1	2	0	4	3	287	
16:15:00	2	131	4	0	0	137	8	0	2	0	11	10	2	127	2	0	0	131	4	0	2	0	4	6	284	
16:30:00	7	110	5	0	1	122	8	0	1	0	9	9	3	105	1	0	1	109	3	1	3	0	4	7	247	
16:45:00	7	139	3	0	3	149	7	0	1	0	6	8	4	102	0	0	0	106	4	0	2	0	10	6	269	1087
17:00:00	5	120	8	0	0	133	9	0	2	0	6	11	2	107	2	0	0	111	2	0	0	0	7	2	257	1057
17:15:00	6	130	5	0	1	141	3	0	0	0	1	3	2	108	2	0	2	112	2	1	2	0	4	5	261	1034
17:30:00	3	121	6	0	0	130	6	0	1	0	7	7	0	103	1	0	1	104	2	0	4	0	5	6	247	1034
17:45:00	4	130	10	0	0	144	8	0	0	0	4	8	1	99	2	1	0	103	0	0	2	0	7	2	257	1022
Grand Total	51	1519	128	0	10	1698	117	1	20	0	102	138	22	1428	19	1	11	1470	22	3	36	0	69	61	3367	-
Approach%	3%	89.5%	7.5%	0%	-	-	84.8%	0.7%	14.5%	0%	-	-	1.5%	97.1%	1.3%	0.1%	-	36.1%	4.9%	59%	0%	-	-	-	-	
Totals %	1.5%	45.1%	3.8%	0%	50.4%	50.4%	3.5%	0%	0.6%	0%	4.1%	4.1%	0.7%	42.4%	0.6%	0%	43.7%	0.7%	0.1%	1.1%	0%	1.8%	1.8%	-	-	
Heavy	1	56	7	0	-	-	7	0	1	0	-	-	2	41	2	0	-	1	1	1	0	-	-	-	-	
Heavy %	2%	3.7%	5.5%	0%	-	-	6%	0%	5%	0%	-	-	9.1%	2.9%	10.5%	0%	-	4.5%	33.3%	2.8%	0%	-	-	-	-	
Bicycles	0	2	1	0	-	-	0	0	0	0	-	-	0	1	0	0	-	0	0	0	0	-	-	-	-	
Bicycle %	0%	0.1%	0.8%	0%	-	-	0%	0%	0%	0%	-	-	0%	0.1%	0%	0%	-	0%	0%	0%	0%	-	-	-	-	



Peak Hour: 08:00 AM - 09:00 AM Weather: Scattered Clouds (-0.83 °C)

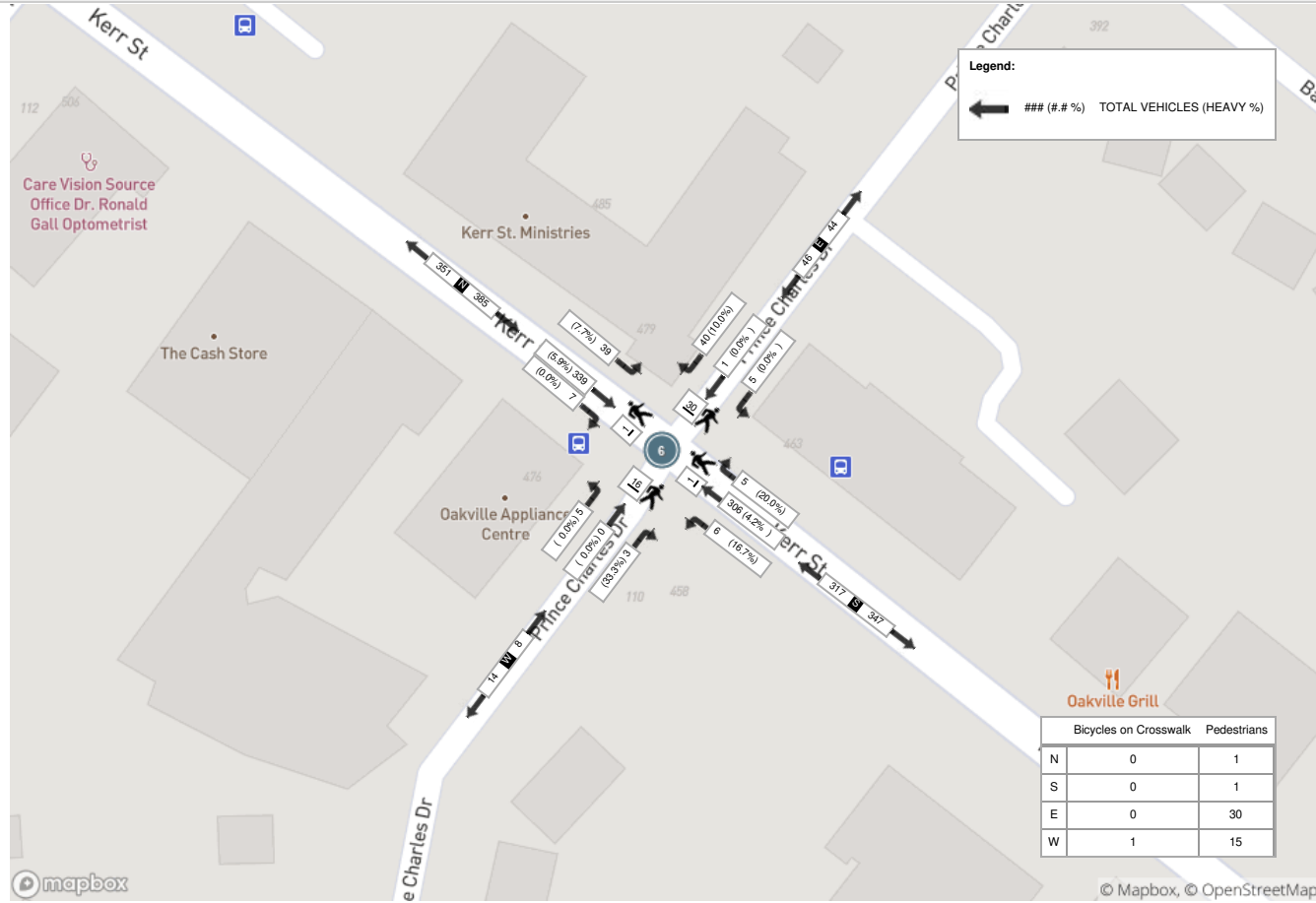
Start Time	N Approach KERR ST						E Approach PRINCE CHARLES DR						S Approach KERR ST						W Approach PRINCE CHARLES DR						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:00:00	2	63	10	0	0	75	16	1	4	0	13	21	0	66	0	0	0	66	1	0	1	0	3	2	164
08:15:00	2	99	11	0	1	112	12	0	1	0	4	13	3	93	2	0	0	98	2	0	1	0	5	3	226
08:30:00	1	80	9	0	0	90	6	0	0	0	6	6	0	67	2	0	0	69	0	0	1	0	7	1	166
08:45:00	2	97	9	0	0	108	6	0	0	0	7	6	2	80	2	0	1	84	0	0	2	0	1	2	200
Grand Total	7	339	39	0	1	385	40	1	5	0	30	46	5	306	6	0	1	317	3	0	5	0	16	8	756
Approach%	1.8%	88.1%	10.1%	0%	-	-	87%	2.2%	10.9%	0%	-	-	1.6%	96.5%	1.9%	0%	-	-	37.5%	0%	62.5%	0%	-	-	-
Totals %	0.9%	44.8%	5.2%	0%	50.9%	5.3%	0.1%	0.7%	0%	6.1%	0.7%	40.5%	0.8%	0%	41.9%	0.4%	0%	0.7%	0%	1.1%	-	-	-		
PHF	0.88	0.86	0.89	0	0.86	0.63	0.25	0.31	0	0.55	0.42	0.82	0.75	0	0.81	0.38	0	0.63	0	0.67	-	-	-		
Heavy	0	20	3	0	23	4	0	0	0	4	1	13	1	0	15	1	0	0	1	-	-	-			
Heavy %	0%	5.9%	7.7%	0%	6%	10%	0%	0%	0%	8.7%	20%	4.2%	16.7%	0%	4.7%	33.3%	0%	0%	0%	12.5%	-	-	-		
Lights	7	319	36	0	362	36	1	5	0	42	4	293	5	0	302	2	0	5	0	7	-	-	-		
Lights %	100%	94.1%	92.3%	0%	94%	90%	100%	100%	0%	91.3%	80%	95.8%	83.3%	0%	95.3%	66.7%	0%	100%	0%	87.5%	-	-	-		
Single-Unit Trucks	0	8	2	0	10	1	0	0	0	1	0	5	0	0	5	0	0	0	0	0	-	-	-		
Single-Unit Trucks %	0%	2.4%	5.1%	0%	2.6%	2.5%	0%	0%	0%	2.2%	0%	1.6%	0%	0%	1.6%	0%	0%	0%	0%	0%	-	-	-		
Buses	0	11	1	0	12	3	0	0	0	3	0	7	1	0	8	1	0	0	0	1	-	-	-		
Buses %	0%	3.2%	2.6%	0%	3.1%	7.5%	0%	0%	0%	6.5%	0%	2.3%	16.7%	0%	2.5%	33.3%	0%	0%	0%	12.5%	-	-	-		
Articulated Trucks	0	1	0	0	1	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	-	-	-		
Articulated Trucks %	0%	0.3%	0%	0%	0.3%	0%	0%	0%	0%	0%	20%	0.3%	0%	0%	0.6%	0%	0%	0%	0%	0%	-	-	-		
Pedestrians	-	-	-	-	1	-	-	-	-	30	-	-	-	-	1	-	-	-	15	-	-	-	-		
Pedestrians%	-	-	-	-	2.1%	-	-	-	-	62.5%	-	-	-	-	2.1%	-	-	-	31.3%	-	-	-	-		
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	1	-	-	-	-		
Bicycles on Crosswalk%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	2.1%	-	-	-	-		
Bicycles on Road	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-		
Bicycles on Road%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	0%	-	-	-	-		



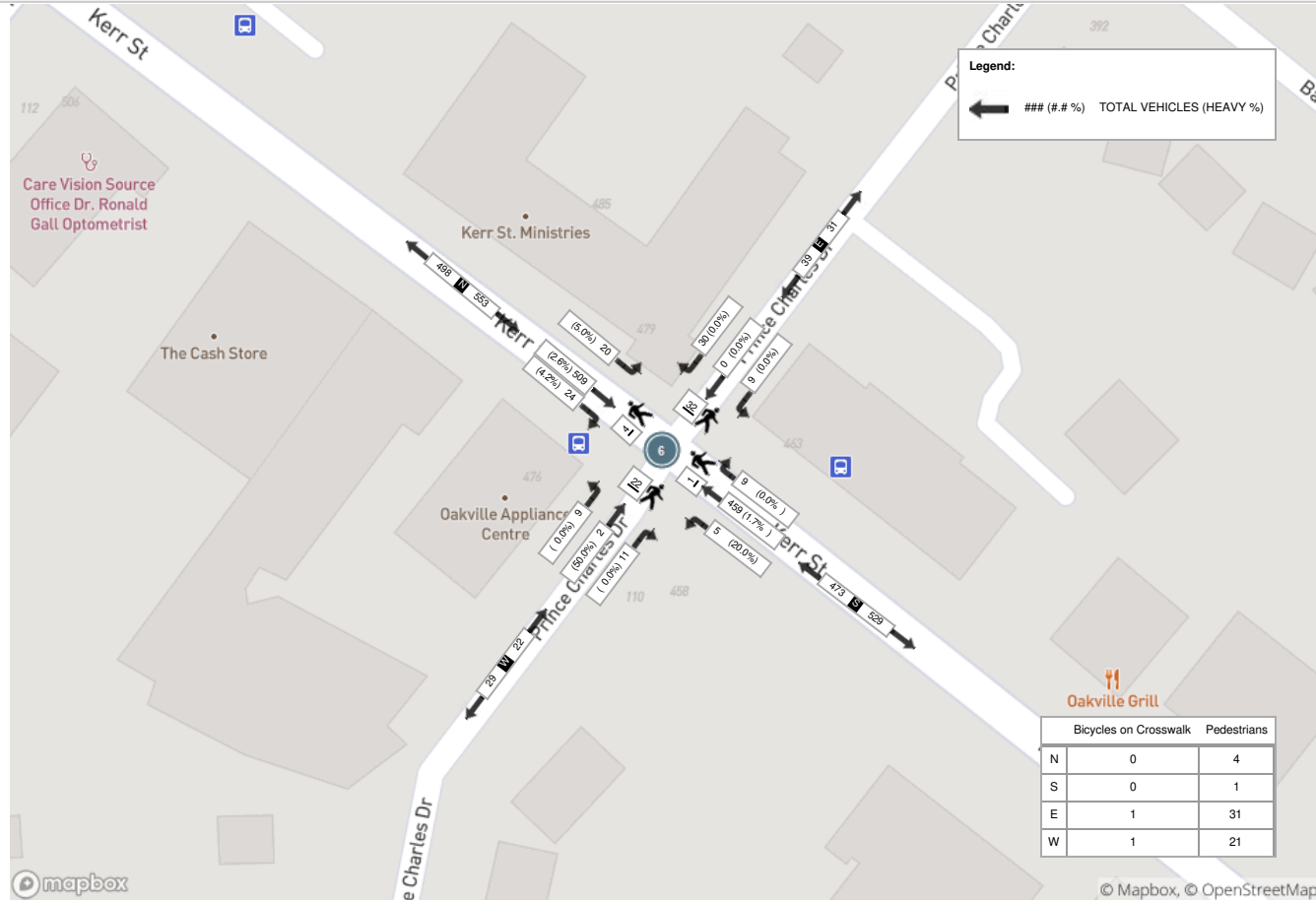
Peak Hour: 04:00 PM - 05:00 PM Weather: Overcast Clouds (7.39 °C)

Start Time	N Approach KERR ST						E Approach PRINCE CHARLES DR						S Approach KERR ST						W Approach PRINCE CHARLES DR						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:00:00	8	129	8	0	0	145	7	0	5	0	6	12	0	125	2	0	0	127	0	1	2	0	4	3	287
16:15:00	2	131	4	0	0	137	8	0	2	0	11	10	2	127	2	0	0	131	4	0	2	0	4	6	284
16:30:00	7	110	5	0	1	122	8	0	1	0	9	9	3	105	1	0	1	109	3	1	3	0	4	7	247
16:45:00	7	139	3	0	3	149	7	0	1	0	6	8	4	102	0	0	0	106	4	0	2	0	10	6	269
Grand Total	24	509	20	0	4	553	30	0	9	0	32	39	9	459	5	0	1	473	11	2	9	0	22	22	1087
Approach%	4.3%	92%	3.6%	0%	-	-	76.9%	0%	23.1%	0%	-	-	1.9%	97%	1.1%	0%	-	-	50%	9.1%	40.9%	0%	-	-	-
Totals %	2.2%	46.8%	1.8%	0%	50.9%	3.6%	2.8%	0%	0.8%	0%	3.6%	0.8%	0.8%	42.2%	0.5%	0%	43.5%	1%	0.2%	0.8%	0%	2%	-	-	-
PHF	0.75	0.92	0.63	0	0.93	0.93	0.94	0	0.45	0	0.81	0.81	0.56	0.9	0.63	0	0.9	0.69	0.5	0.75	0	0.79	-	-	-
Heavy	1	13	1	0	15	15	0	0	0	0	0	0	0	8	1	0	9	0	1	0	0	1	-	-	-
Heavy %	4.2%	2.6%	5%	0%	2.7%	2.7%	0%	0%	0%	0%	0%	0%	0%	1.7%	20%	0%	1.9%	0%	50%	0%	0%	0%	4.5%	-	-
Lights	23	496	19	0	538	538	30	0	9	0	39	39	9	451	4	0	464	11	1	9	0	21	-	-	-
Lights %	95.8%	97.4%	95%	0%	97.3%	97.3%	100%	0%	100%	0%	100%	100%	100%	98.3%	80%	0%	98.1%	100%	50%	100%	0%	95.5%	-	-	-
Single-Unit Trucks	1	5	1	0	7	7	0	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	0	0	0
Single-Unit Trucks %	4.2%	1%	5%	0%	1.3%	1.3%	0%	0%	0%	0%	0%	0%	0%	1.3%	0%	0%	1.3%	0%	0%	0%	0%	0%	0%	0%	0%
Buses	0	8	0	0	8	8	0	0	0	0	0	0	0	2	1	0	3	0	1	0	0	1	-	-	-
Buses %	0%	1.6%	0%	0%	1.4%	1.4%	0%	0%	0%	0%	0%	0%	0.4%	20%	0%	0.6%	0%	50%	0%	0%	0%	4.5%	-	-	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Articulated Trucks %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Pedestrians	-	-	-	-	4	4	-	-	-	-	31	31	-	-	-	-	1	1	-	-	-	-	21	21	21
Pedestrians%	-	-	-	-	6.8%	6.8%	-	-	-	-	52.5%	52.5%	-	-	-	-	1.7%	1.7%	-	-	-	-	35.6%	35.6%	35.6%
Bicycles on Crosswalk	-	-	-	-	0	0	-	-	-	-	1	1	-	-	-	-	0	0	-	-	-	-	1	1	1
Bicycles on Crosswalk%	-	-	-	-	0%	0%	-	-	-	-	1.7%	1.7%	-	-	-	-	0%	0%	-	-	-	-	1.7%	1.7%	1.7%
Bicycles on Road	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Bicycles on Road%	-	-	-	-	0%	0%	-	-	-	-	0%	0%	-	-	-	-	0%	0%	-	-	-	-	0%	0%	0%

Peak Hour: 08:00 AM - 09:00 AM Weather: Scattered Clouds (-0.83 °C)



Peak Hour: 04:00 PM - 05:00 PM Weather: Overcast Clouds (7.39 °C)





Turning Movement Count (4 . KERR ST & SHEPHERD RD)

Start Time	N Approach KERR ST					E Approach SHEPHERD RD					S Approach KERR ST					Int. Total (15 min)	Int. Total (1 hr)
	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	UTurn S:S	Peds S:	Approach Total		
07:00:00	27	5	0	0	32	27	5	0	0	32	3	20	0	0	23	87	
07:15:00	41	9	0	0	50	37	10	0	0	47	7	21	0	0	28	125	
07:30:00	39	16	0	0	55	33	11	0	0	44	2	23	0	0	25	124	
07:45:00	52	14	0	0	66	38	23	0	0	61	9	49	0	0	58	185	521
08:00:00	48	14	0	1	62	43	18	0	1	61	5	46	0	1	51	174	608
08:15:00	69	22	0	1	91	31	13	0	2	44	19	67	0	0	86	221	704
08:30:00	69	22	0	0	91	36	16	0	1	52	16	61	0	1	77	220	800
08:45:00	79	33	0	2	112	35	23	0	2	58	14	49	0	5	63	233	848
BREAK																	
16:00:00	102	37	0	5	139	37	16	0	0	53	24	111	0	2	135	327	
16:15:00	105	30	0	4	135	21	13	0	2	34	29	88	0	2	117	286	
16:30:00	94	45	0	3	139	27	18	0	1	45	19	79	0	3	98	282	
16:45:00	100	34	0	0	134	37	23	0	1	60	27	108	0	1	135	329	1224
17:00:00	109	37	0	1	146	40	19	0	1	59	30	94	0	3	124	329	1226
17:15:00	88	44	0	4	132	30	23	0	1	53	31	104	0	3	135	320	1260
17:30:00	95	38	0	1	133	35	24	0	1	59	25	84	0	6	109	301	1279
17:45:00	79	28	0	2	107	31	28	0	2	59	20	86	0	6	106	272	1222
Grand Total	1196	428	0	24	1624	538	283	0	15	821	280	1090	0	33	1370	3815	-
Approach%	73.6%	26.4%	0%	-	-	65.5%	34.5%	0%	-	-	20.4%	79.6%	0%	-	-	-	-
Totals %	31.3%	11.2%	0%	-	42.6%	14.1%	7.4%	0%	-	21.5%	7.3%	28.6%	0%	-	35.9%	-	-
Heavy	29	6	0	-	-	6	15	0	-	-	12	22	0	-	-	-	-
Heavy %	2.4%	1.4%	0%	-	-	1.1%	5.3%	0%	-	-	4.3%	2%	0%	-	-	-	-
Bicycles	2	0	0	-	-	1	0	0	-	-	0	0	0	-	-	-	-
Bicycle %	0.2%	0%	0%	-	-	0.2%	0%	0%	-	-	0%	0%	0%	-	-	-	-



Peak Hour: 08:00 AM - 09:00 AM Weather: Scattered Clouds (-0.83 °C)

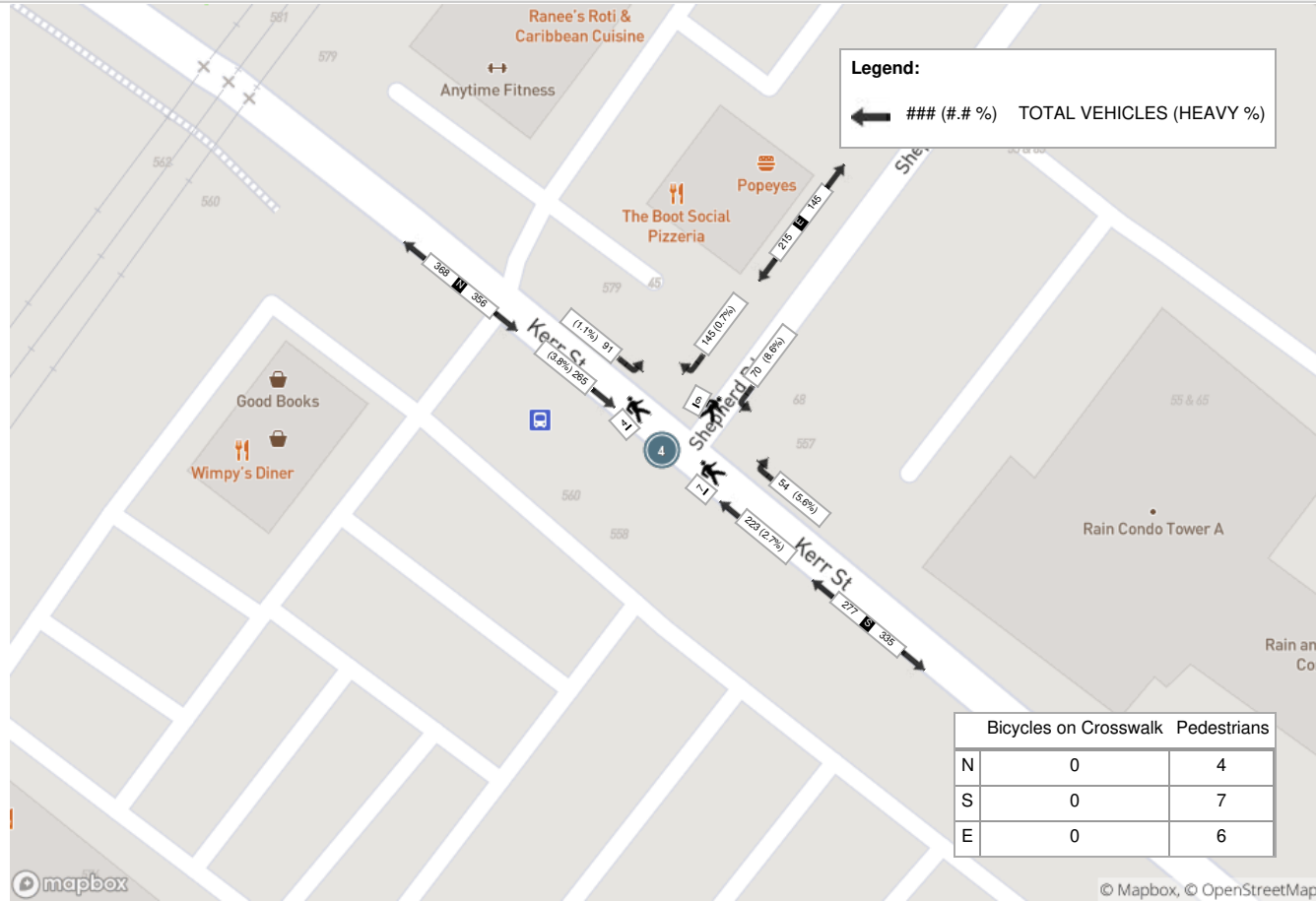
Start Time	N Approach KERR ST					E Approach SHEPHERD RD					S Approach KERR ST					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
08:00:00	48	14	0	1	62	43	18	0	1	61	5	46	0	1	51	174
08:15:00	69	22	0	1	91	31	13	0	2	44	19	67	0	0	86	221
08:30:00	69	22	0	0	91	36	16	0	1	52	16	61	0	1	77	220
08:45:00	79	33	0	2	112	35	23	0	2	58	14	49	0	5	63	233
Grand Total	265	91	0	4	356	145	70	0	6	215	54	223	0	7	277	848
Approach%	74.4%	25.6%	0%	-	-	67.4%	32.6%	0%	-	-	19.5%	80.5%	0%	-	-	-
Totals %	31.3%	10.7%	0%	-	42%	17.1%	8.3%	0%	-	25.4%	6.4%	26.3%	0%	-	32.7%	-
PHF	0.84	0.69	0	-	0.79	0.84	0.76	0	-	0.88	0.71	0.83	0	-	0.81	-
Heavy	10	1	0	-	11	1	6	0	-	7	3	6	0	-	9	-
Heavy %	3.8%	1.1%	0%	-	3.1%	0.7%	8.6%	0%	-	3.3%	5.6%	2.7%	0%	-	3.2%	-
Lights	255	90	0	-	345	144	64	0	-	208	51	217	0	-	268	-
Lights %	96.2%	98.9%	0%	-	96.9%	99.3%	91.4%	0%	-	96.7%	94.4%	97.3%	0%	-	96.8%	-
Single-Unit Trucks	4	0	0	-	4	1	1	0	-	2	0	0	0	-	0	-
Single-Unit Trucks %	1.5%	0%	0%	-	1.1%	0.7%	1.4%	0%	-	0.9%	0%	0%	0%	-	0%	-
Buses	5	1	0	-	6	0	5	0	-	5	2	5	0	-	7	-
Buses %	1.9%	1.1%	0%	-	1.7%	0%	7.1%	0%	-	2.3%	3.7%	2.2%	0%	-	2.5%	-
Articulated Trucks	1	0	0	-	1	0	0	0	-	0	1	1	0	-	2	-
Articulated Trucks %	0.4%	0%	0%	-	0.3%	0%	0%	0%	-	0%	1.9%	0.4%	0%	-	0.7%	-
Pedestrians	-	-	-	4	-	-	-	-	6	-	-	-	-	7	-	-
Pedestrians%	-	-	-	23.5%	-	-	-	-	35.3%	-	-	-	-	41.2%	-	-
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	-
Bicycles on Road%	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-



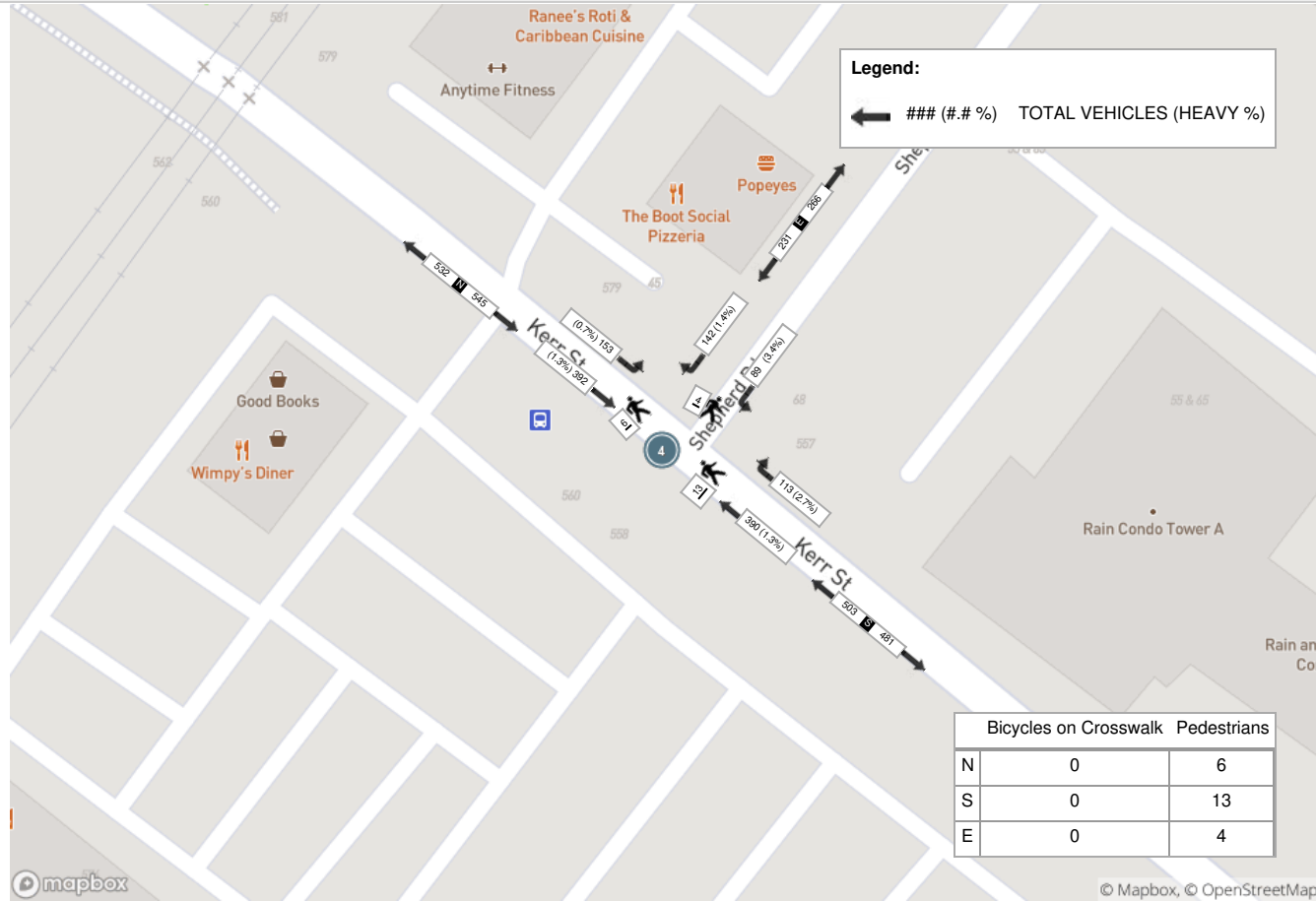
Peak Hour: 04:45 PM - 05:45 PM Weather: Overcast Clouds (7.39 °C)

Start Time	N Approach KERR ST					E Approach SHEPHERD RD					S Approach KERR ST					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
16:45:00	100	34	0	0	134	37	23	0	1	60	27	108	0	1	135	329
17:00:00	109	37	0	1	146	40	19	0	1	59	30	94	0	3	124	329
17:15:00	88	44	0	4	132	30	23	0	1	53	31	104	0	3	135	320
17:30:00	95	38	0	1	133	35	24	0	1	59	25	84	0	6	109	301
Grand Total	392	153	0	6	545	142	89	0	4	231	113	390	0	13	503	1279
Approach%	71.9%	28.1%	0%	-	-	61.5%	38.5%	0%	-	-	22.5%	77.5%	0%	-	-	-
Totals %	30.6%	12%	0%	42.6%	11.1%	7%	0%	18.1%	8.8%	30.5%	0%	39.3%	-	-	-	-
PHF	0.9	0.87	0	0.93	0.89	0.93	0	0.96	0.91	0.9	0	0.93	-	-	-	-
Heavy	5	1	0	6	2	3	0	5	3	5	0	8	-	-	-	-
Heavy %	1.3%	0.7%	0%	1.1%	1.4%	3.4%	0%	2.2%	2.7%	1.3%	0%	1.6%	-	-	-	-
Lights	387	152	0	539	140	86	0	226	110	385	0	495	-	-	-	-
Lights %	98.7%	99.3%	0%	98.9%	98.6%	96.6%	0%	97.8%	97.3%	98.7%	0%	98.4%	-	-	-	-
Single-Unit Trucks	1	1	0	2	2	1	0	3	1	0	0	1	-	-	-	-
Single-Unit Trucks %	0.3%	0.7%	0%	0.4%	1.4%	1.1%	0%	1.3%	0.9%	0%	0%	0.2%	-	-	-	-
Buses	4	0	0	4	0	2	0	2	2	5	0	7	-	-	-	-
Buses %	1%	0%	0%	0.7%	0%	2.2%	0%	0.9%	1.8%	1.3%	0%	1.4%	-	-	-	-
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	-
Articulated Trucks %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	-	-	-
Pedestrians	-	-	-	6	-	-	-	4	-	-	-	13	-	-	-	-
Pedestrians%	-	-	-	26.1%	-	-	-	17.4%	-	-	-	56.5%	-	-	-	-
Bicycles on Crosswalk	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	-
Bicycles on Crosswalk%	-	-	-	0%	-	-	-	0%	-	-	-	0%	-	-	-	-
Bicycles on Road	1	0	0	0	-	0	0	0	0	-	0	0	0	0	-	-
Bicycles on Road%	-	-	-	0%	-	-	-	0%	-	-	-	0%	-	-	-	-

Peak Hour: 08:00 AM - 09:00 AM Weather: Scattered Clouds (-0.83 °C)



Peak Hour: 04:45 PM - 05:45 PM Weather: Overcast Clouds (7.39 °C)





Turning Movement Count (8 . STEWART ST & KERR ST)

Start Time	N Approach KERR ST						E Approach STEWART ST					S Approach KERR ST					W Approach STEWART ST					Int. Total (15 min)	Int. Total (1 hr)			
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N			UTurn W:W	Peds W:	Approach Total
07:00:00	4	28	4	0	0	36	13	0	2	0	1	15	1	20	1	0	1	22	3	1	1	0	2	5	78	
07:15:00	2	25	6	0	1	33	13	2	0	0	1	15	1	25	1	0	5	27	0	2	6	0	2	8	83	
07:30:00	5	27	10	0	5	42	24	1	2	0	3	27	1	43	0	0	3	44	1	2	6	0	6	9	122	
07:45:00	3	47	5	0	8	55	19	6	0	0	11	25	4	39	1	0	6	44	0	4	4	0	7	8	132	415
08:00:00	6	48	9	0	14	63	14	15	2	0	15	31	8	37	2	0	7	47	1	13	6	0	6	20	161	498
08:15:00	8	65	14	0	5	87	19	13	7	0	12	39	6	59	3	0	4	68	1	8	12	0	7	21	215	630
08:30:00	8	65	7	0	0	80	18	3	3	0	5	24	1	40	1	0	5	42	0	3	4	0	7	7	153	661
08:45:00	10	64	11	0	3	85	19	3	2	0	4	24	5	46	1	0	2	52	4	2	13	0	10	19	180	709
BREAK																										
16:00:00	14	95	11	0	4	120	25	4	1	0	2	30	3	89	3	0	5	95	7	3	18	0	8	28	273	
16:15:00	14	93	13	0	4	120	19	2	1	0	8	22	7	94	3	0	4	104	1	0	10	0	3	11	257	
16:30:00	15	71	16	0	5	102	19	6	2	0	11	27	4	73	4	0	3	81	5	3	10	0	9	18	228	
16:45:00	9	100	16	0	5	125	10	3	5	0	5	18	3	78	2	0	3	83	2	4	10	0	13	16	242	1000
17:00:00	23	71	14	0	2	108	13	3	2	0	7	18	2	78	0	0	4	80	3	3	19	0	8	25	231	958
17:15:00	19	85	15	0	4	119	23	2	1	0	5	26	5	79	1	0	4	85	0	3	11	0	6	14	244	945
17:30:00	12	88	15	0	2	115	18	2	2	0	4	22	2	72	0	0	2	74	4	3	11	0	6	18	229	946
17:45:00	17	87	14	0	3	118	9	5	3	0	4	17	2	70	1	0	2	73	7	2	14	0	5	23	231	935
Grand Total	169	1059	180	0	65	1408	275	70	35	0	98	380	55	942	24	0	60	1021	39	56	155	0	105	250	3059	-
Approach%	12%	75.2%	12.8%	0%	-	-	72.4%	18.4%	9.2%	0%	-	-	5.4%	92.3%	2.4%	0%	-	-	15.6%	22.4%	62%	0%	-	-	-	-
Totals %	5.5%	34.6%	5.9%	0%	46%	-	9%	2.3%	1.1%	0%	12.4%	-	1.8%	30.8%	0.8%	0%	33.4%	-	1.3%	1.8%	5.1%	0%	8.2%	-	-	-
Heavy	2	47	7	0	-	-	11	8	0	0	-	-	4	34	3	0	-	-	1	10	3	0	-	-	-	-
Heavy %	1.2%	4.4%	3.9%	0%	-	-	4%	11.4%	0%	0%	-	-	7.3%	3.6%	12.5%	0%	-	-	2.6%	17.9%	1.9%	0%	-	-	-	-
Bicycles	0	1	0	0	-	-	1	0	0	0	-	-	0	0	0	0	-	-	0	1	0	0	-	-	-	-
Bicycle %	0%	0.1%	0%	0%	-	-	0.4%	0%	0%	0%	-	-	0%	0%	0%	0%	-	-	0%	1.8%	0%	0%	-	-	-	-



Peak Hour: 08:00 AM - 09:00 AM Weather: Scattered Clouds (-0.83 °C)

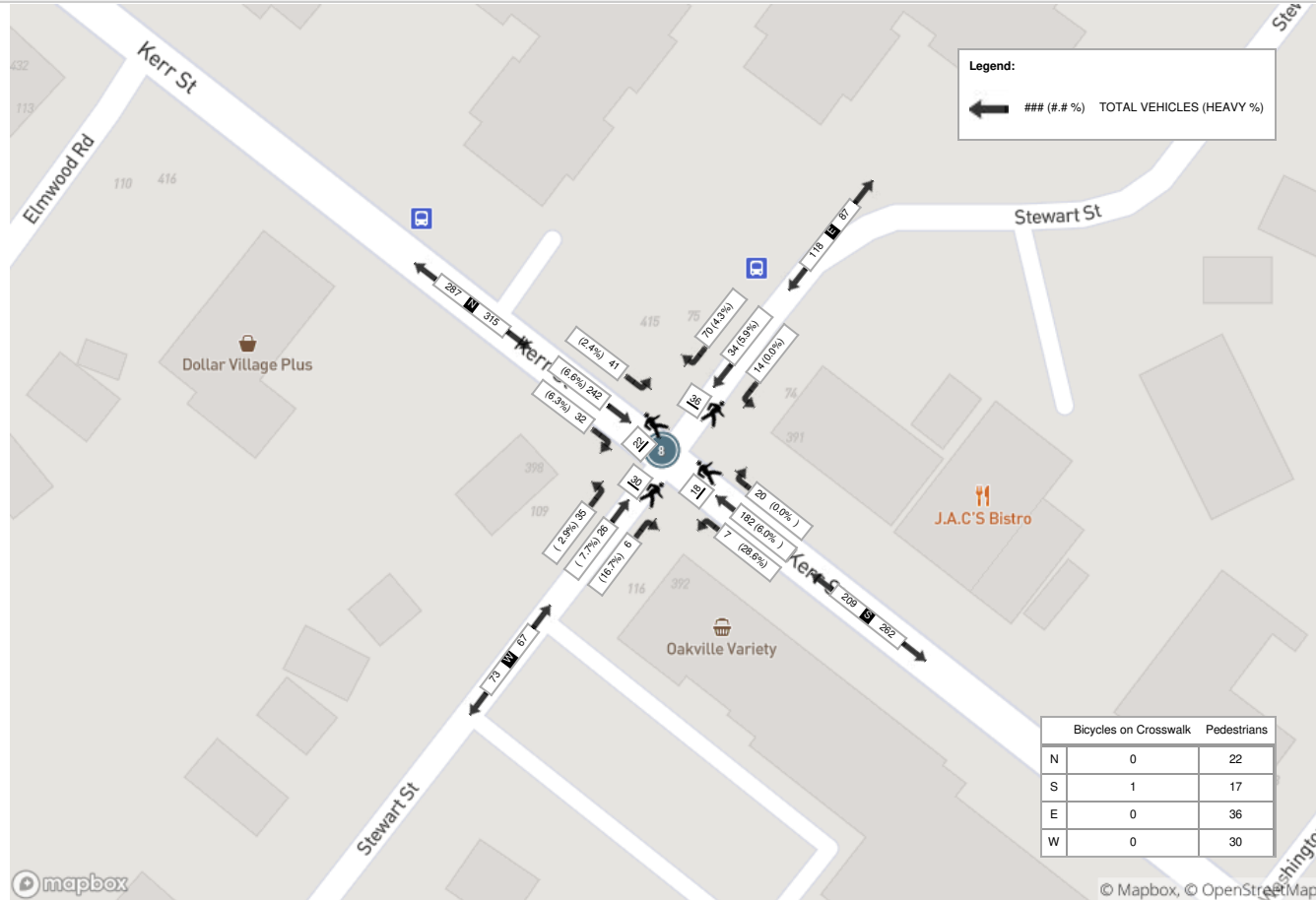
Start Time	N Approach KERR ST						E Approach STEWART ST						S Approach KERR ST						W Approach STEWART ST						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:00:00	6	48	9	0	14	63	14	15	2	0	15	31	8	37	2	0	7	47	1	13	6	0	6	20	161
08:15:00	8	65	14	0	5	87	19	13	7	0	12	39	6	59	3	0	4	68	1	8	12	0	7	21	215
08:30:00	8	65	7	0	0	80	18	3	3	0	5	24	1	40	1	0	5	42	0	3	4	0	7	7	153
08:45:00	10	64	11	0	3	85	19	3	2	0	4	24	5	46	1	0	2	52	4	2	13	0	10	19	180
Grand Total	32	242	41	0	22	315	70	34	14	0	36	118	20	182	7	0	18	209	6	26	35	0	30	67	709
Approach%	10.2%	76.8%	13%	0%	-	-	59.3%	28.8%	11.9%	0%	-	-	9.6%	87.1%	3.3%	0%	-	9%	38.8%	52.2%	0%	-	-	-	-
Totals %	4.5%	34.1%	5.8%	0%	44.4%	44.4%	9.9%	4.8%	2%	0%	16.6%	16.6%	2.8%	25.7%	1%	0%	29.5%	0.8%	3.7%	4.9%	0%	9.4%	9.4%	-	-
PHF	0.8	0.93	0.73	0	0.91	0.91	0.92	0.57	0.5	0	0.76	0.76	0.63	0.77	0.58	0	0.77	0.38	0.5	0.67	0	0.8	0.8	-	-
Heavy	2	16	1	0	19	19	3	2	0	0	5	5	0	11	2	0	13	1	2	1	0	4	4	-	-
Heavy %	6.3%	6.6%	2.4%	0%	6%	6%	4.3%	5.9%	0%	0%	4.2%	4.2%	0%	6%	28.6%	0%	6.2%	16.7%	7.7%	2.9%	0%	6%	6%	-	-
Lights	30	226	40	0	296	296	67	32	14	0	113	113	20	171	5	0	196	5	24	34	0	63	63	-	-
Lights %	93.8%	93.4%	97.6%	0%	94%	94%	95.7%	94.1%	100%	0%	95.8%	95.8%	100%	94%	71.4%	0%	93.8%	83.3%	92.3%	97.1%	0%	94%	94%	-	-
Single-Unit Trucks	0	8	0	0	8	8	3	0	0	0	3	3	0	3	0	0	3	0	0	1	0	1	1	-	-
Single-Unit Trucks %	0%	3.3%	0%	0%	2.5%	2.5%	4.3%	0%	0%	0%	2.5%	2.5%	0%	1.6%	0%	0%	1.4%	0%	0%	2.9%	0%	1.5%	1.5%	-	-
Buses	2	7	1	0	10	10	0	2	0	0	2	2	0	8	2	0	10	1	2	0	0	3	3	-	-
Buses %	6.3%	2.9%	2.4%	0%	3.2%	3.2%	0%	5.9%	0%	0%	1.7%	1.7%	0%	4.4%	28.6%	0%	4.8%	16.7%	7.7%	0%	0%	4.5%	4.5%	-	-
Articulated Trucks	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Articulated Trucks %	0%	0.4%	0%	0%	0.3%	0.3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	-
Pedestrians	-	-	-	-	22	22	-	-	-	-	36	36	-	-	-	-	17	-	-	-	-	30	30	-	-
Pedestrians%	-	-	-	-	20.8%	20.8%	-	-	-	-	34%	34%	-	-	-	-	16%	-	-	-	-	28.3%	28.3%	-	-
Bicycles on Crosswalk	-	-	-	-	0	0	-	-	-	-	0	0	-	-	-	-	1	-	-	-	-	0	0	-	-
Bicycles on Crosswalk%	-	-	-	-	0%	0%	-	-	-	-	0%	0%	-	-	-	-	0.9%	-	-	-	-	0%	0%	-	-
Bicycles on Road	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	-	-
Bicycles on Road%	-	-	-	-	0%	0%	-	-	-	-	0%	0%	-	-	-	-	0%	-	-	-	-	0%	0%	-	-



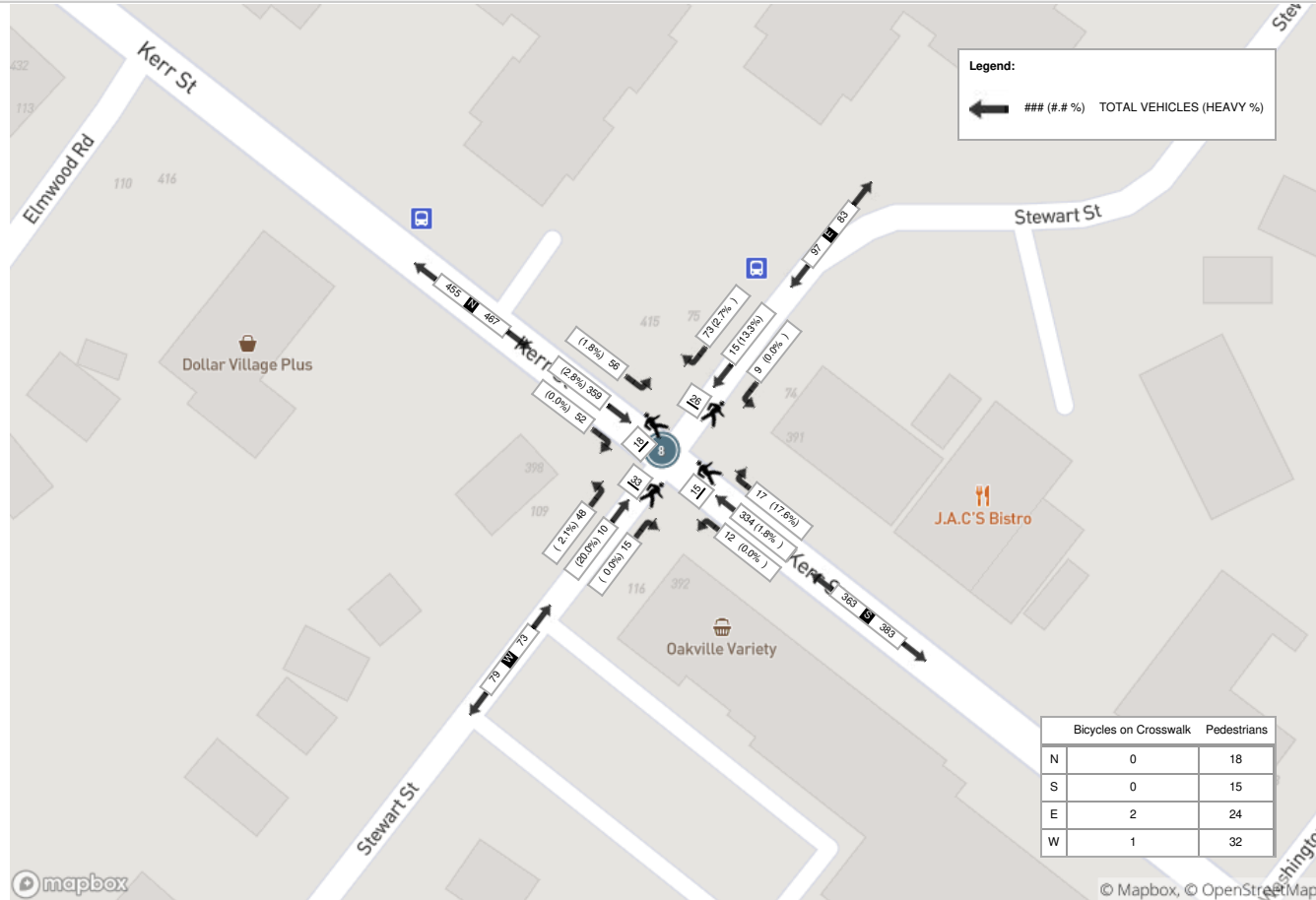
Peak Hour: 04:00 PM - 05:00 PM Weather: Overcast Clouds (7.39 °C)

Start Time	N Approach KERR ST						E Approach STEWART ST						S Approach KERR ST						W Approach STEWART ST						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:00:00	14	95	11	0	4	120	25	4	1	0	2	30	3	89	3	0	5	95	7	3	18	0	8	28	273
16:15:00	14	93	13	0	4	120	19	2	1	0	8	22	7	94	3	0	4	104	1	0	10	0	3	11	257
16:30:00	15	71	16	0	5	102	19	6	2	0	11	27	4	73	4	0	3	81	5	3	10	0	9	18	228
16:45:00	9	100	16	0	5	125	10	3	5	0	5	18	3	78	2	0	3	83	2	4	10	0	13	16	242
Grand Total	52	359	56	0	18	467	73	15	9	0	26	97	17	334	12	0	15	363	15	10	48	0	33	73	1000
Approach%	11.1%	76.9%	12%	0%	-	-	75.3%	15.5%	9.3%	0%	-	-	4.7%	92%	3.3%	0%	-	-	20.5%	13.7%	65.8%	0%	-	-	-
Totals %	5.2%	35.9%	5.6%	0%	46.7%	7.3%	1.5%	0.9%	0%	9.7%	1.7%	33.4%	1.2%	0%	36.3%	1.5%	1%	4.8%	0%	7.3%	-	-	-		
PHF	0.87	0.9	0.88	0	0.93	0.73	0.63	0.45	0	0.81	0.61	0.89	0.75	0	0.87	0.54	0.63	0.67	0	0.65	-	-	-		
Heavy	0	10	1	0	11	2	2	0	0	4	3	6	0	0	9	0	2	1	0	3	-	-	-		
Heavy %	0%	2.8%	1.8%	0%	2.4%	2.7%	13.3%	0%	0%	4.1%	17.6%	1.8%	0%	0%	2.5%	0%	20%	2.1%	0%	4.1%	-	-	-		
Lights	52	349	55	0	456	71	13	9	0	93	14	328	12	0	354	15	8	47	0	70	-	-	-		
Lights %	100%	97.2%	98.2%	0%	97.6%	97.3%	86.7%	100%	0%	95.9%	82.4%	98.2%	100%	0%	97.5%	100%	80%	97.9%	0%	95.9%	-	-	-		
Single-Unit Trucks	0	4	0	0	4	2	0	0	0	2	3	4	0	0	7	0	0	0	0	0	-	-	-		
Single-Unit Trucks %	0%	1.1%	0%	0%	0.9%	2.7%	0%	0%	0%	2.1%	17.6%	1.2%	0%	0%	1.9%	0%	0%	0%	0%	0%	-	-	-		
Buses	0	6	1	0	7	0	2	0	0	2	0	2	0	0	2	0	2	1	0	3	-	-	-		
Buses %	0%	1.7%	1.8%	0%	1.5%	0%	13.3%	0%	0%	2.1%	0%	0.6%	0%	0%	0.6%	0%	20%	2.1%	0%	4.1%	-	-	-		
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-		
Articulated Trucks %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	-	-		
Pedestrians	-	-	-	-	18	-	-	-	-	24	-	-	-	-	15	-	-	-	-	32	-	-	-		
Pedestrians%	-	-	-	-	19.6%	-	-	-	-	26.1%	-	-	-	-	16.3%	-	-	-	-	34.8%	-	-	-		
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	2	-	-	-	-	0	-	-	-	-	1	-	-	-		
Bicycles on Crosswalk%	-	-	-	-	0%	-	-	-	-	2.2%	-	-	-	-	0%	-	-	-	-	1.1%	-	-	-		
Bicycles on Road	0	0	0	0	0	-	1	0	0	0	-	0	0	0	0	-	0	0	0	0	-	-	-		
Bicycles on Road%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-		

Peak Hour: 08:00 AM - 09:00 AM Weather: Scattered Clouds (-0.83 °C)



Peak Hour: 04:00 PM - 05:00 PM Weather: Overcast Clouds (7.39 °C)





Turning Movement Count (5 . KERR ST & WYECROFT RD)

Start Time	N Approach KERR ST					S Approach KERR ST					W Approach WYECROFT RD					Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	UTurn N:N	Peds N:	Approach Total	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	9	30	0	0	39	24	22	0	0	46	15	1	0	0	16	101	
07:15:00	16	40	0	0	56	29	34	0	0	63	13	0	0	0	13	132	
07:30:00	17	55	0	0	72	24	24	0	0	48	13	2	0	3	15	135	
07:45:00	37	63	0	0	100	44	45	0	0	89	13	0	0	1	13	202	570
08:00:00	36	67	0	0	103	42	50	0	0	92	16	3	0	1	19	214	683
08:15:00	42	89	0	0	131	59	38	0	0	97	16	1	0	0	17	245	796
08:30:00	29	76	0	0	105	59	37	0	0	96	24	2	0	1	26	227	888
08:45:00	20	98	0	0	118	60	33	0	0	93	25	1	0	0	26	237	923
BREAK																	
16:00:00	20	142	0	0	162	123	41	0	0	164	22	4	0	2	26	352	
16:15:00	15	115	1	0	131	90	26	0	0	116	31	4	0	3	35	282	
16:30:00	18	127	0	0	145	88	36	0	0	124	31	5	0	2	36	305	
16:45:00	38	119	0	0	157	133	29	0	0	162	25	4	1	1	30	349	1288
17:00:00	22	123	0	0	145	124	29	0	0	153	31	13	1	1	45	343	1279
17:15:00	28	107	0	0	135	114	20	0	0	134	28	5	0	1	33	302	1299
17:30:00	21	121	0	0	142	115	20	0	0	135	26	2	0	1	28	305	1299
17:45:00	28	100	0	0	128	95	34	0	0	129	22	3	0	0	25	282	1232
Grand Total	396	1472	1	0	1869	1223	518	0	0	1741	351	50	2	17	403	4013	-
Approach%	21.2%	78.8%	0.1%	-	-	70.2%	29.8%	0%	-	-	87.1%	12.4%	0.5%	-	-	-	-
Totals %	9.9%	36.7%	0%	-	46.6%	30.5%	12.9%	0%	-	43.4%	8.7%	1.2%	0%	-	10%	-	-
Heavy	19	24	0	-	-	13	23	0	-	-	16	1	0	-	-	-	-
Heavy %	4.8%	1.6%	0%	-	-	1.1%	4.4%	0%	-	-	4.6%	2%	0%	-	-	-	-
Bicycles	0	0	0	-	-	0	2	0	-	-	2	0	0	-	-	-	-
Bicycle %	0%	0%	0%	-	-	0%	0.4%	0%	-	-	0.6%	0%	0%	-	-	-	-



Peak Hour: 08:00 AM - 09:00 AM Weather: Scattered Clouds (-0.83 °C)

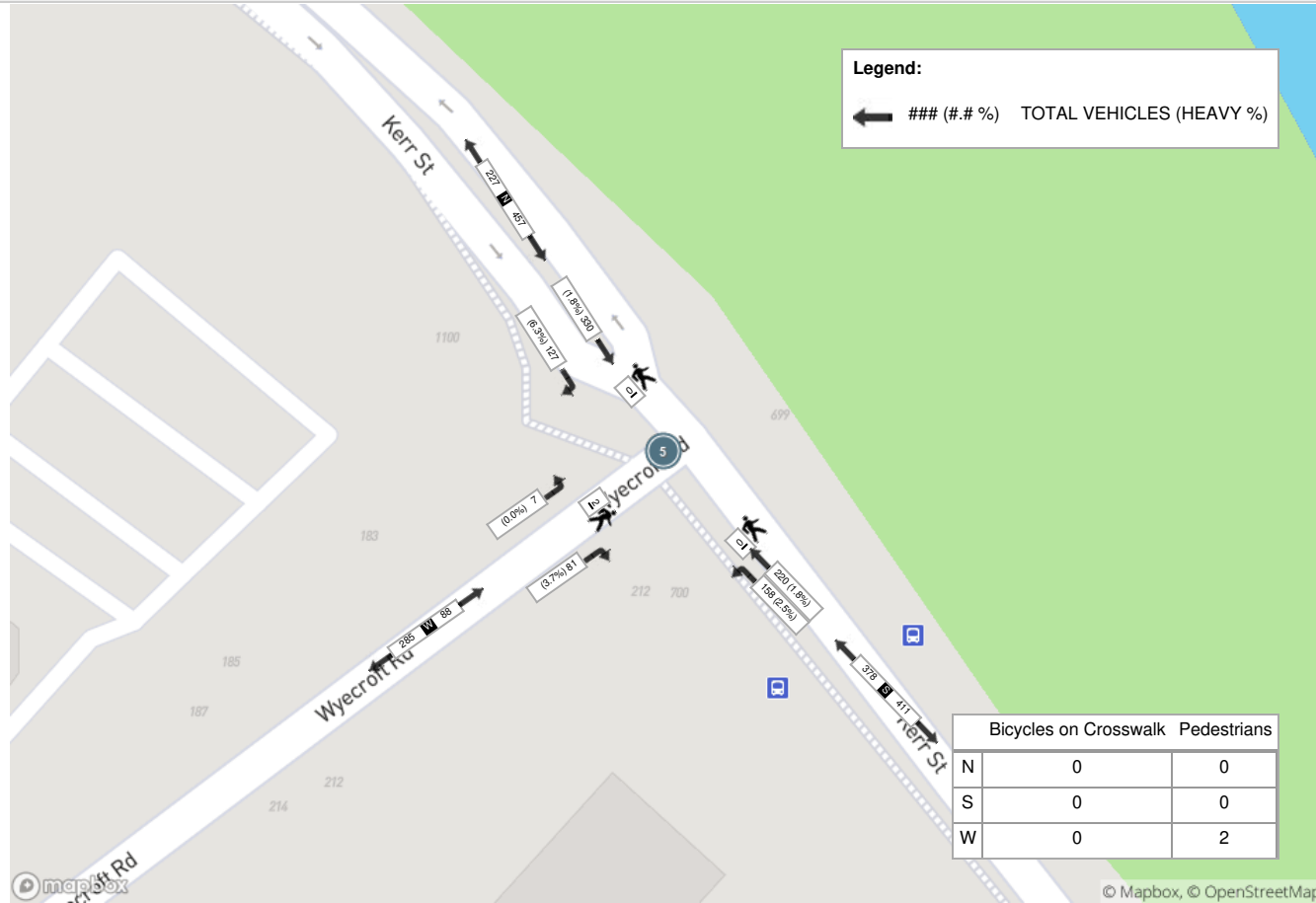
Start Time	N Approach KERR ST					S Approach KERR ST					W Approach WYECROFT RD					Int. Total (15 min)
	Right	Thru	UTurn	Peds	Approach Total	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	
08:00:00	36	67	0	0	103	42	50	0	0	92	16	3	0	1	19	214
08:15:00	42	89	0	0	131	59	38	0	0	97	16	1	0	0	17	245
08:30:00	29	76	0	0	105	59	37	0	0	96	24	2	0	1	26	227
08:45:00	20	98	0	0	118	60	33	0	0	93	25	1	0	0	26	237
Grand Total	127	330	0	0	457	220	158	0	0	378	81	7	0	2	88	923
Approach%	27.8%	72.2%	0%	-	-	58.2%	41.8%	0%	-	-	92%	8%	0%	-	-	-
Totals %	13.8%	35.8%	0%	49.5%	23.8%	17.1%	0%	41%	8.8%	0.8%	0%	9.5%	-	-	-	-
PHF	0.76	0.84	0	0.87	0.92	0.79	0	0.97	0.81	0.58	0	0.85	-	-	-	-
Heavy	8	6	0	14	4	4	0	8	3	0	0	3	-	-	-	-
Heavy %	6.3%	1.8%	0%	3.1%	1.8%	2.5%	0%	2.1%	3.7%	0%	0%	3.4%	-	-	-	-
Lights	119	324	0	443	216	154	0	370	78	7	0	85	-	-	-	-
Lights %	93.7%	98.2%	0%	96.9%	98.2%	97.5%	0%	97.9%	96.3%	100%	0%	96.6%	-	-	-	-
Single-Unit Trucks	7	3	0	10	0	2	0	2	0	0	0	0	-	-	-	-
Single-Unit Trucks %	5.5%	0.9%	0%	2.2%	0%	1.3%	0%	0.5%	0%	0%	0%	0%	-	-	-	-
Buses	0	2	0	2	3	2	0	5	3	0	0	3	-	-	-	-
Buses %	0%	0.6%	0%	0.4%	1.4%	1.3%	0%	1.3%	3.7%	0%	0%	3.4%	-	-	-	-
Articulated Trucks	1	1	0	2	1	0	0	1	0	0	0	0	-	-	-	-
Articulated Trucks %	0.8%	0.3%	0%	0.4%	0.5%	0%	0%	0.3%	0%	0%	0%	0%	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	0	-	-	-	2	-	-	-	-
Pedestrians%	-	-	-	0%	-	-	-	0%	-	-	-	100%	-	-	-	-
Bicycles on Crosswalk	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	-
Bicycles on Crosswalk%	-	-	-	0%	-	-	-	0%	-	-	-	0%	-	-	-	-
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	-	-	-
Bicycles on Road%	-	-	-	0%	-	-	-	0%	-	-	-	0%	-	-	-	-



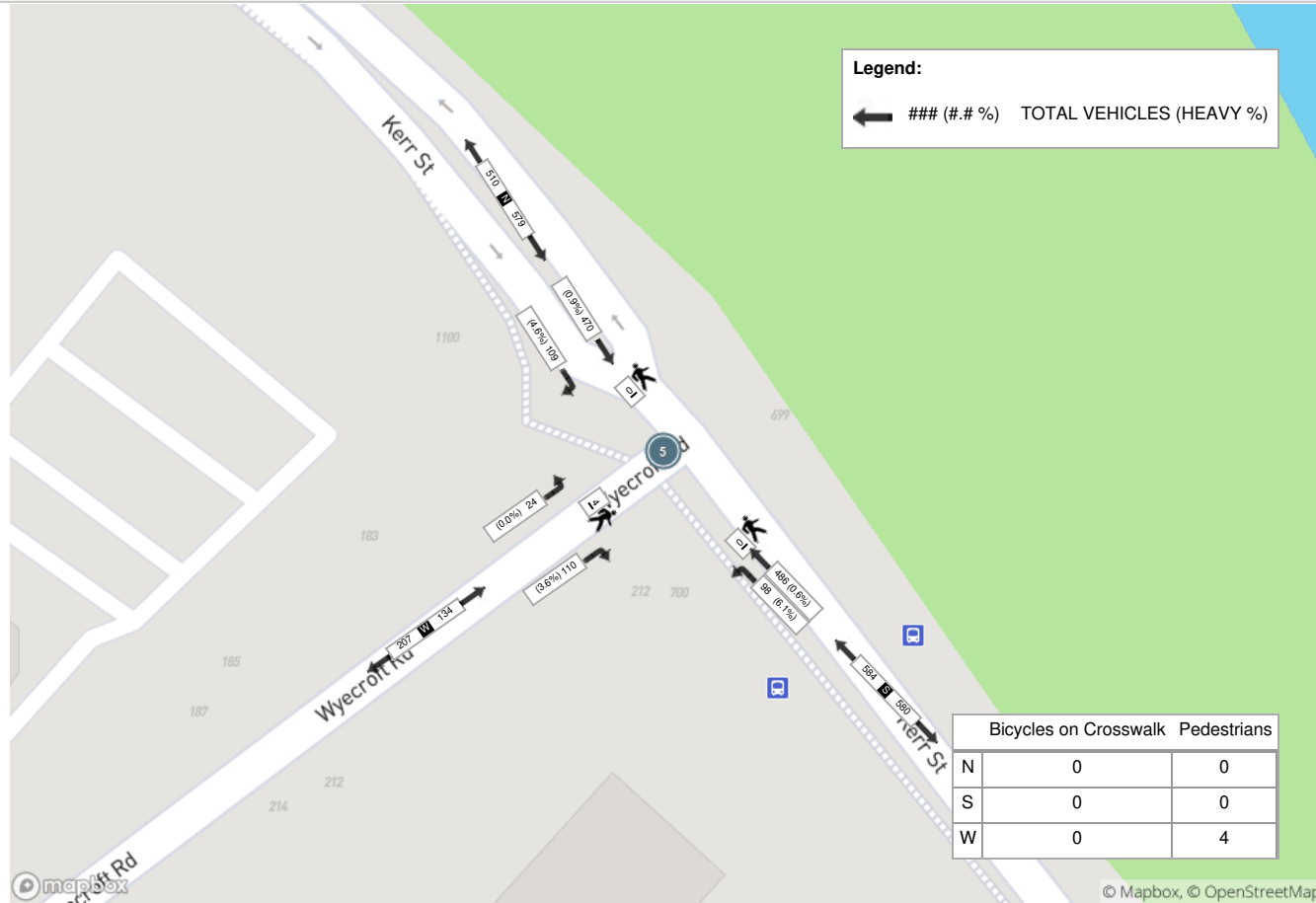
Peak Hour: 04:45 PM - 05:45 PM Weather: Overcast Clouds (7.39 °C)

Start Time	N Approach KERR ST					S Approach KERR ST					W Approach WYECROFT RD					Int. Total (15 min)
	Right	Thru	UTurn	Peds	Approach Total	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	
16:45:00	38	119	0	0	157	133	29	0	0	162	25	4	1	1	30	349
17:00:00	22	123	0	0	145	124	29	0	0	153	31	13	1	1	45	343
17:15:00	28	107	0	0	135	114	20	0	0	134	28	5	0	1	33	302
17:30:00	21	121	0	0	142	115	20	0	0	135	26	2	0	1	28	305
Grand Total	109	470	0	0	579	486	98	0	0	584	110	24	2	4	136	1299
Approach%	18.8%	81.2%	0%	-	-	83.2%	16.8%	0%	-	-	80.9%	17.6%	1.5%	-	-	-
Totals %	8.4%	36.2%	0%	44.6%	37.4%	7.5%	0%	45%	8.5%	1.8%	0.2%	10.5%	-	-	-	-
PHF	0.72	0.96	0	0.92	0.91	0.84	0	0.9	0.89	0.46	0.5	0.76	-	-	-	-
Heavy	5	4	0	9	3	6	0	9	4	0	0	4	-	-	-	-
Heavy %	4.6%	0.9%	0%	1.6%	0.6%	6.1%	0%	1.5%	3.6%	0%	0%	2.9%	-	-	-	-
Lights	104	466	0	570	483	92	0	575	106	24	2	132	-	-	-	-
Lights %	95.4%	99.1%	0%	98.4%	99.4%	93.9%	0%	98.5%	96.4%	100%	100%	97.1%	-	-	-	-
Single-Unit Trucks	2	0	0	2	0	3	0	3	2	0	0	2	-	-	-	-
Single-Unit Trucks %	1.8%	0%	0%	0.3%	0%	3.1%	0%	0.5%	1.8%	0%	0%	1.5%	-	-	-	-
Buses	0	3	0	3	3	2	0	5	2	0	0	2	-	-	-	-
Buses %	0%	0.6%	0%	0.5%	0.6%	2%	0%	0.9%	1.8%	0%	0%	1.5%	-	-	-	-
Articulated Trucks	3	1	0	4	0	1	0	1	0	0	0	0	-	-	-	-
Articulated Trucks %	2.8%	0.2%	0%	0.7%	0%	1%	0%	0.2%	0%	0%	0%	0%	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	0	-	-	-	4	-	-	-	-
Pedestrians%	-	-	-	0%	-	-	-	0%	-	-	-	100%	-	-	-	-
Bicycles on Crosswalk	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	-
Bicycles on Crosswalk%	-	-	-	0%	-	-	-	0%	-	-	-	0%	-	-	-	-
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	-	-	-
Bicycles on Road%	-	-	-	0%	-	-	-	0%	-	-	-	0%	-	-	-	-

Peak Hour: 08:00 AM - 09:00 AM Weather: Scattered Clouds (-0.83 °C)



Peak Hour: 04:45 PM - 05:45 PM Weather: Overcast Clouds (7.39 °C)





Turning Movement Count (10 . SPEERS RD & 50 SPEERS RD (EAST / WEST PUDO ACCESS))

Start Time	N Approach 41 SPEERS RD						E Approach SPEERS RD						S Approach 50 SPEERS RD (EAST ACCESS)						W Approach SPEERS RD						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	0	0	0	0	1	0	0	57	1	0	0	58	4	0	1	0	4	5	0	81	0	0	0	81	144	
07:15:00	0	0	0	0	5	0	0	71	1	0	1	72	5	0	3	0	4	8	0	136	0	0	2	136	216	
07:30:00	1	0	0	0	6	1	0	82	2	0	0	84	6	0	1	0	3	7	0	140	0	0	1	140	232	
07:45:00	0	0	0	0	10	0	0	118	4	0	0	122	7	0	3	0	2	10	0	186	0	0	2	186	318	910
08:00:00	0	0	0	0	1	0	0	152	1	0	1	153	6	0	3	0	6	9	1	157	0	0	2	158	320	1086
08:15:00	0	0	1	0	7	1	0	207	0	0	0	207	2	0	3	0	3	5	0	233	0	0	1	233	446	1316
08:30:00	0	0	0	0	2	0	0	213	2	0	0	215	2	0	5	0	1	7	0	164	0	0	0	164	386	1470
08:45:00	1	0	0	0	3	1	0	184	0	0	0	184	3	0	1	0	1	4	0	193	0	0	0	193	382	1534
BREAK																										
16:00:00	0	0	1	0	9	1	0	270	1	0	0	271	2	0	2	0	4	4	0	196	0	0	1	196	472	
16:15:00	2	0	1	0	7	3	0	290	2	0	0	292	4	0	1	0	3	5	1	234	0	0	0	235	535	
16:30:00	0	0	0	0	5	0	0	230	2	0	0	232	5	0	5	0	1	10	0	231	0	0	0	231	473	
16:45:00	1	0	1	0	8	2	0	296	3	0	0	299	1	0	0	0	5	1	0	208	0	0	0	208	510	1990
17:00:00	0	0	1	0	4	1	0	263	2	0	0	265	1	0	4	0	0	5	1	239	0	0	0	240	511	2029
17:15:00	0	0	0	0	2	0	0	292	1	0	1	293	2	0	2	0	2	4	1	215	0	0	0	216	513	2007
17:30:00	0	0	1	0	4	1	0	239	4	0	0	243	2	0	1	0	0	3	0	208	0	0	0	208	455	1989
17:45:00	0	0	0	0	6	0	0	217	4	0	0	221	2	0	3	0	1	5	2	169	0	0	0	171	397	1876
Grand Total	5	0	6	0	80	11	0	3181	30	0	3	3211	54	0	38	0	40	92	6	2990	0	0	9	2996	6310	-
Approach%	45.5%	0%	54.5%	0%	-	0%	99.1%	0.9%	0%	-	58.7%	0%	41.3%	0%	-	0.2%	99.8%	0%	0%	-	-	-	-	-	-	-
Totals %	0.1%	0%	0.1%	0%	0.2%	0%	50.4%	0.5%	0%	50.9%	0.9%	0%	0.6%	0%	1.5%	0.1%	47.4%	0%	0%	47.5%	0%	0%	0%	47.5%	-	-
Heavy	0	0	0	0	-	0	138	0	0	-	0	0	2	0	-	2	133	0	0	-	-	-	-	-	-	-
Heavy %	0%	0%	0%	0%	-	0%	4.3%	0%	0%	-	0%	0%	5.3%	0%	-	33.3%	4.4%	0%	0%	-	-	-	-	-	-	-
Bicycles	0	0	0	0	-	0	1	0	0	-	0	0	0	0	-	0	4	0	0	-	-	-	-	-	-	-
Bicycle %	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0.1%	0%	0%	-	-	-	-	-	-	-



Peak Hour: 08:00 AM - 09:00 AM Weather: Scattered Clouds (-0.83 °C)

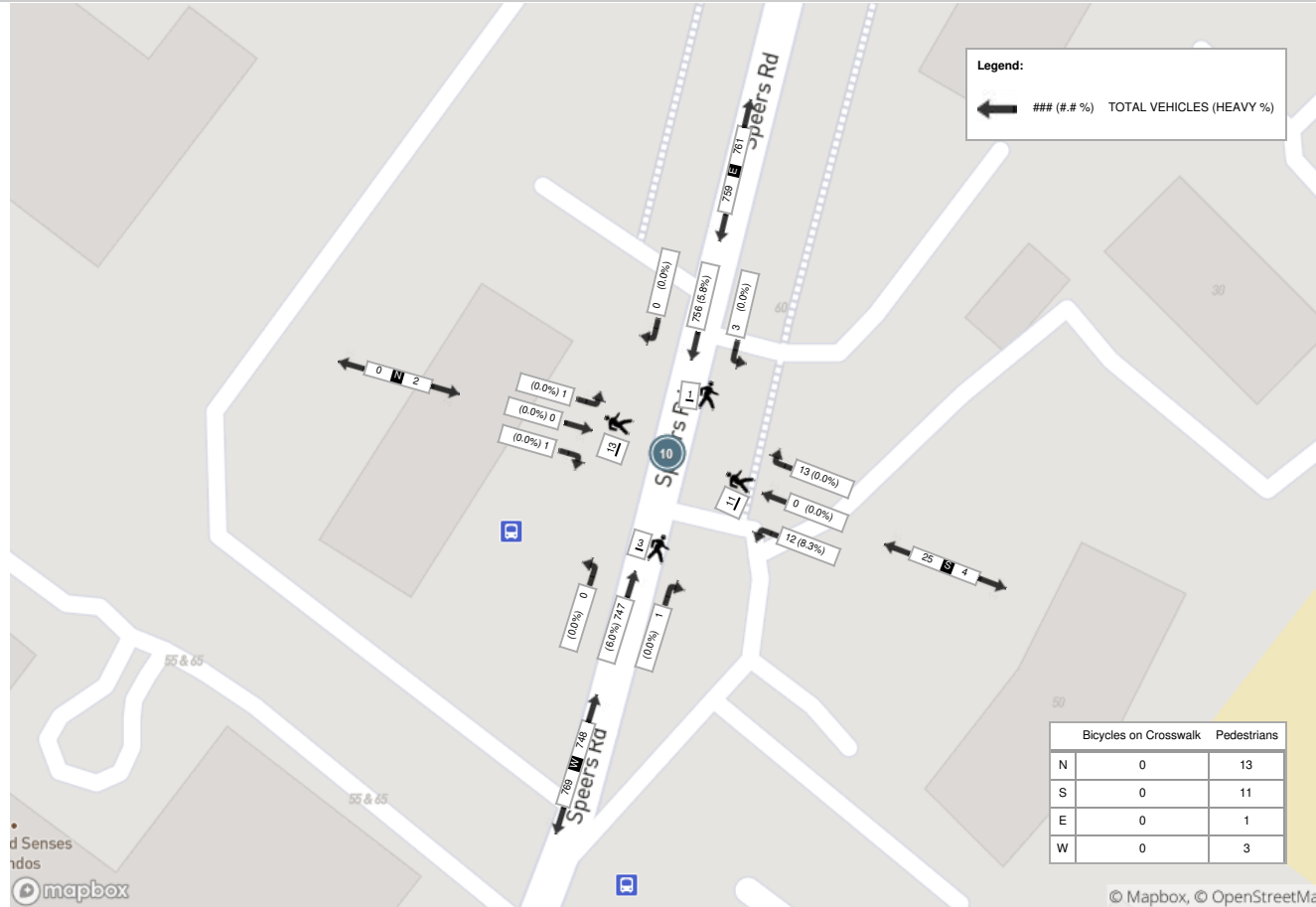
Start Time	N Approach 41 SPEERS RD						E Approach SPEERS RD						S Approach 50 SPEERS RD (EAST ACCESS)						W Approach SPEERS RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:00:00	0	0	0	0	1	0	0	152	1	0	1	153	6	0	3	0	6	9	1	157	0	0	2	158	320
08:15:00	0	0	1	0	7	1	0	207	0	0	0	207	2	0	3	0	3	5	0	233	0	0	1	233	446
08:30:00	0	0	0	0	2	0	0	213	2	0	0	215	2	0	5	0	1	7	0	164	0	0	0	164	386
08:45:00	1	0	0	0	3	1	0	184	0	0	0	184	3	0	1	0	1	4	0	193	0	0	0	193	382
Grand Total	1	0	1	0	13	2	0	756	3	0	1	759	13	0	12	0	11	25	1	747	0	0	3	748	1534
Approach%	50%	0%	50%	0%	-	-	0%	99.6%	0.4%	0%	-	-	52%	0%	48%	0%	-	-	0.1%	99.9%	0%	0%	-	-	-
Totals %	0.1%	0%	0.1%	0%	0.1%	0.1%	0%	49.3%	0.2%	0%	49.5%	49.5%	0.8%	0%	0.8%	0%	1.6%	1.6%	0.1%	48.7%	0%	0%	48.8%	48.8%	-
PHF	0.25	0	0.25	0	0.5	0.5	0	0.89	0.38	0	0.88	0.88	0.54	0	0.6	0	0.69	0.69	0.25	0.8	0	0	0.8	0.8	-
Heavy	0	0	0	0	0	0	0	44	0	0	0	44	0	0	1	0	1	1	0	45	0	0	0	45	-
Heavy %	0%	0%	0%	0%	0%	0%	0%	5.8%	0%	0%	5.8%	5.8%	0%	0%	8.3%	0%	4%	4%	0%	6%	0%	0%	6%	6%	-
Lights	1	0	1	0	0	2	0	712	3	0	0	715	13	0	11	0	24	24	1	702	0	0	0	703	-
Lights %	100%	0%	100%	0%	0%	100%	0%	94.2%	100%	0%	94.2%	94.2%	100%	0%	91.7%	0%	96%	96%	100%	94%	0%	0%	94%	94%	-
Single-Unit Trucks	0	0	0	0	0	0	0	18	0	0	0	18	0	0	0	0	0	0	0	19	0	0	0	19	-
Single-Unit Trucks %	0%	0%	0%	0%	0%	0%	0%	2.4%	0%	0%	2.4%	2.4%	0%	0%	0%	0%	0%	0%	2.5%	0%	0%	0%	2.5%	2.5%	-
Buses	0	0	0	0	0	0	0	24	0	0	0	24	0	0	1	0	1	1	0	24	0	0	0	24	-
Buses %	0%	0%	0%	0%	0%	0%	0%	3.2%	0%	0%	3.2%	3.2%	0%	0%	8.3%	0%	4%	4%	0%	3.2%	0%	0%	0%	3.2%	-
Articulated Trucks	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	2	0	0	0	0	2	-
Articulated Trucks %	0%	0%	0%	0%	0%	0%	0%	0.3%	0%	0%	0.3%	0.3%	0%	0%	0%	0%	0%	0%	0.3%	0%	0%	0%	0%	0.3%	-
Pedestrians	-	-	-	-	13	-	-	-	-	-	1	-	-	-	-	-	11	-	-	-	-	-	3	-	-
Pedestrians%	-	-	-	-	46.4%	-	-	-	-	-	3.6%	-	-	-	-	-	39.3%	-	-	-	-	-	10.7%	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	0	-	-
Bicycles on Road%	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-



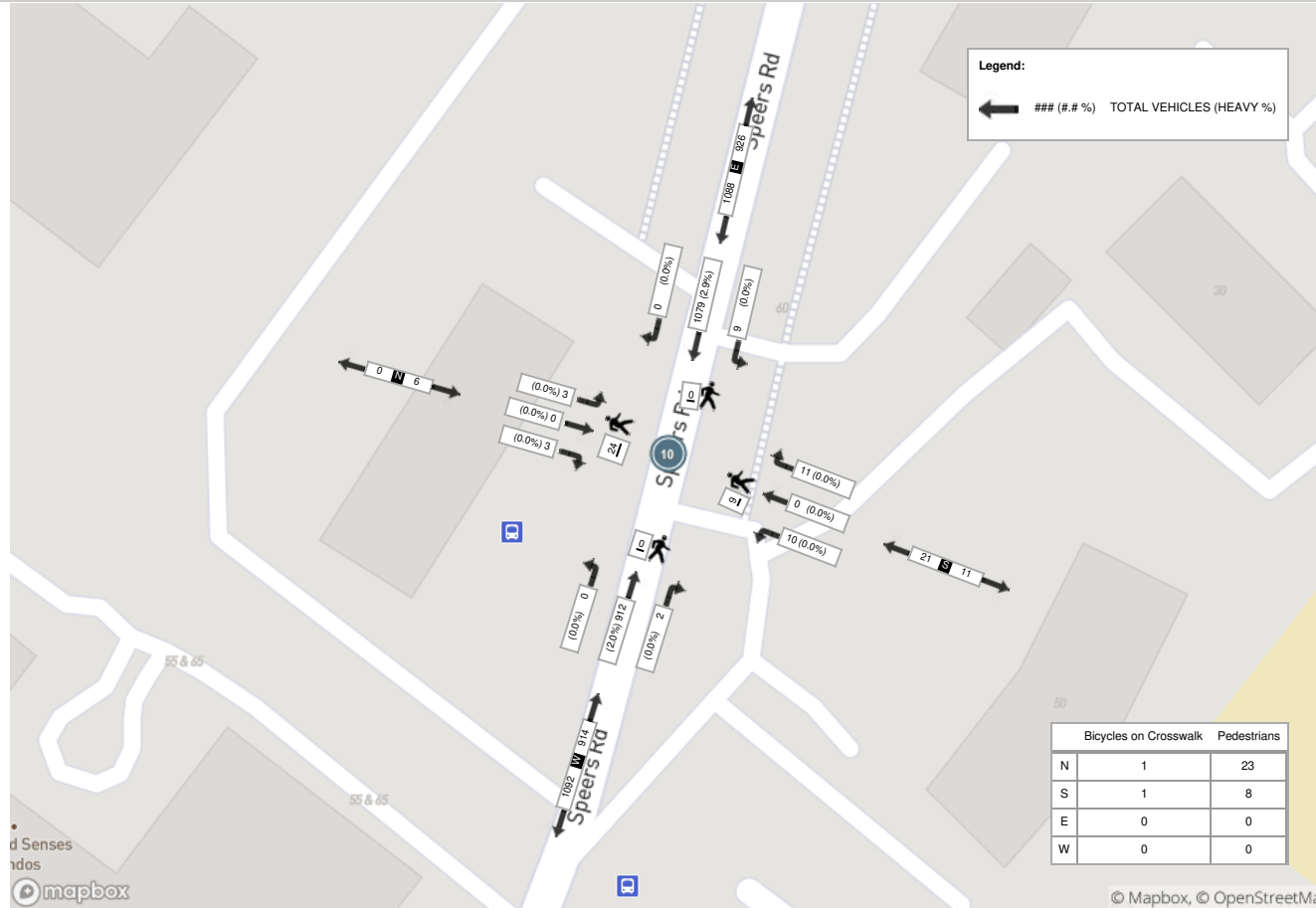
Peak Hour: 04:15 PM - 05:15 PM Weather: Overcast Clouds (7.39 °C)

Start Time	N Approach 41 SPEERS RD						E Approach SPEERS RD						S Approach 50 SPEERS RD (EAST ACCESS)						W Approach SPEERS RD						Int. Total (15 min)	
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total		
16:15:00	2	0	1	0	7	3	0	290	2	0	0	292	4	0	1	0	3	5	1	234	0	0	0	235	535	
16:30:00	0	0	0	0	5	0	0	230	2	0	0	232	5	0	5	0	1	10	0	231	0	0	0	231	473	
16:45:00	1	0	1	0	8	2	0	296	3	0	0	299	1	0	0	0	5	1	0	208	0	0	0	208	510	
17:00:00	0	0	1	0	4	1	0	263	2	0	0	265	1	0	4	0	0	5	1	239	0	0	0	240	511	
Grand Total	3	0	3	0	24	6	0	1079	9	0	0	1088	11	0	10	0	9	21	2	912	0	0	0	914	2029	
Approach%	50%	0%	50%	0%	-	-	0%	99.2%	0.8%	0%	-	-	52.4%	0%	47.6%	0%	-	-	0.2%	99.8%	0%	0%	-	-	-	-
Totals %	0.1%	0%	0.1%	0%	0.3%	0.3%	0%	53.2%	0.4%	0%	53.6%	53.6%	0.5%	0%	0.5%	0%	1%	1%	0.1%	44.9%	0%	0%	0%	45%	-	-
PHF	0.38	0	0.75	0	0.5	0.5	0	0.91	0.75	0	0.91	0.91	0.55	0	0.5	0	0.53	0.53	0.5	0.95	0	0	0	0.95	-	-
Heavy	0	0	0	0	0	0	0	31	0	0	31	31	0	0	0	0	0	0	0	18	0	0	0	18	-	-
Heavy %	0%	0%	0%	0%	0%	0%	0%	2.9%	0%	0%	2.8%	2.8%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	2%	-	-
Lights	3	0	3	0	6	6	0	1048	9	0	1057	1057	11	0	10	0	21	21	2	894	0	0	0	896	-	-
Lights %	100%	0%	100%	0%	100%	100%	0%	97.1%	100%	0%	97.2%	97.2%	100%	0%	100%	0%	100%	100%	100%	98%	0%	0%	0%	98%	-	-
Single-Unit Trucks	0	0	0	0	0	0	0	11	0	0	11	11	0	0	0	0	0	0	0	3	0	0	0	3	-	-
Single-Unit Trucks %	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0.3%	0%	0%	0%	0.3%	-	-
Buses	0	0	0	0	0	0	0	19	0	0	19	19	0	0	0	0	0	0	0	15	0	0	0	15	-	-
Buses %	0%	0%	0%	0%	0%	0%	0%	1.8%	0%	0%	1.7%	1.7%	0%	0%	0%	0%	0%	0%	0%	1.6%	0%	0%	0%	1.6%	-	-
Articulated Trucks	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Articulated Trucks %	0%	0%	0%	0%	0%	0%	0%	0.1%	0%	0%	0.1%	0.1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	-
Pedestrians	-	-	-	-	23	-	-	-	-	-	0	0	-	-	-	-	8	-	-	-	-	-	0	0	-	-
Pedestrians%	-	-	-	-	69.7%	-	-	-	-	-	0%	0%	-	-	-	-	24.2%	-	-	-	-	-	0%	0%	-	-
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	0	0	-	-	-	-	1	-	-	-	-	-	0	0	-	-
Bicycles on Crosswalk%	-	-	-	-	3%	-	-	-	-	-	0%	0%	-	-	-	-	3%	-	-	-	-	-	0%	0%	-	-
Bicycles on Road	0	0	0	0	0	-	0	1	0	0	0	0	0	0	0	0	0	-	0	1	0	0	0	0	-	-
Bicycles on Road%	-	-	-	-	0%	-	-	-	-	-	0%	0%	-	-	-	-	0%	-	-	-	-	-	0%	0%	-	-

Peak Hour: 08:00 AM - 09:00 AM Weather: Scattered Clouds (-0.83 °C)



Peak Hour: 04:15 PM - 05:15 PM Weather: Overcast Clouds (7.39 °C)





Turning Movement Count (9 . 50 SPEERS RD & INTERNAL ACCESS / UG ACCESS)

Start Time	SE Approach UG ACCESS							SW Approach SW ACCESS							E Approach 50 SPEERS RD							S Approach INTERNAL ACCESS							W Approach 50 SPEERS RD							Int. Total (15 min)	Int. Total (1 hr)	
	Hard Right SE:E	Bear Left SE:W	Left SE:SW	Hard Left SE:S	UTurn SE:SE	Peds SE:	Approach Total	Hard Right SW:S	Right SW:SE	Bear Right SW:E	Hard Left SW:W	UTurn SW:SW	Peds SW:	Approach Total	Thru E:W	Bear Left E:SW	Left E:S	Hard Left E:SE	UTurn E:E	Peds E:	Approach Total	Hard Right S:SE	Right S:E	Left S:W	Hard Left S:SW	UTurn S:S	Peds S:	Approach Total	Hard Right W:SW	Right W:S	Bear Right W:SE	Thru W:E	UTurn W:W	Peds W:	Approach Total			
07:00:00	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	0	1	1	0	0	0	0	1	0	0	0	1	0	0	0	3	0	3	4	5	
07:15:00	1	1	0	0	0	0	2	0	0	0	0	3	0	0	0	0	0	0	1	0	0	1	0	0	2	1	0	0	0	5	1	1	0	1	4			
07:30:00	0	0	0	0	0	8	0	0	0	1	1	7	2	0	0	1	0	0	2	1	0	2	0	0	9	2	0	0	1	0	0	0	1	6				
07:45:00	2	1	0	0	0	1	3	0	0	0	1	2	1	0	0	0	0	0	0	0	0	2	0	0	2	2	1	1	0	0	0	2	2	8	23			
08:00:00	0	2	0	0	0	2	2	0	0	0	0	6	0	1	0	0	0	0	1	1	0	0	0	0	3	0	0	0	1	3	0	6	4	7	25			
08:15:00	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	2	0	0	3	2	0	0	1	0	0	2	1	3	24			
08:30:00	1	0	0	0	0	6	1	0	0	0	2	4	2	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	2	0	1	2	5	23			
08:45:00	2	1	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	2	2	5	20				
BREAK																																						
16:00:00	0	0	0	0	0	2	0	0	0	1	1	0	2	2	0	0	0	0	0	0	0	0	1	0	0	4	1	0	1	1	2	0	7	4	7			
16:15:00	0	0	0	0	0	2	0	0	0	2	0	3	2	0	1	1	0	0	0	2	0	0	0	0	3	0	0	1	0	2	0	3	3	7				
16:30:00	1	1	0	0	0	2	2	0	0	0	0	2	0	0	0	3	1	0	0	4	0	1	0	0	2	1	0	2	1	7	0	2	10	17				
16:45:00	0	0	0	0	0	1	0	0	0	0	0	4	0	0	0	3	0	1	3	0	0	0	0	3	0	3	3	3	1	3	0	5	10	13	44			
17:00:00	0	0	0	0	0	4	0	0	0	0	0	3	0	1	0	1	0	0	0	2	0	1	0	0	4	1	2	2	1	5	0	0	10	13	50			
17:15:00	0	0	0	0	0	3	0	0	0	0	0	2	0	1	0	0	0	1	1	2	0	1	0	0	4	1	0	2	2	4	0	1	8	11	54			
17:30:00	0	0	0	0	0	4	0	0	0	0	0	6	0	0	0	1	0	0	1	1	0	0	0	6	0	1	1	1	2	0	1	5	6	43				
17:45:00	1	0	0	0	0	2	1	0	0	0	0	4	0	1	0	2	0	0	0	3	0	0	0	0	2	0	1	1	0	3	0	0	5	9	39			
Grand Total	8	6	0	0	0	40	14	0	0	4	5	0	52	9	4	1	9	5	1	9	20	0	11	0	0	0	54	11	8	15	10	39	0	40	72	126	-	
Approach%	57.1%	42.9%	0%	0%	0%	-	-	0%	0%	44.4%	55.6%	0%	-	20%	5%	45%	25%	5%	-	0%	100%	0%	0%	0%	-	11.1%	20.8%	13.9%	54.2%	0%	-	-	-	-	-	-		
Totals %	6.3%	4.8%	0%	0%	0%	11.1%	-	0%	0%	3.2%	4%	0%	7.1%	3.2%	0.8%	7.1%	4%	0.8%	15.9%	0%	8.7%	0%	0%	0%	8.7%	6.3%	11.9%	7.9%	31%	0%	57.1%	-	-	-	-	-		
Heavy %	0	0	0	0	0	-	-	0	0	0	0	0	-	0	0	0	0	1	-	0	0	0	0	0	-	0	0	0	1	0	-	-	-	-	-	-	-	
Heavy %	0%	0%	0%	0%	0%	-	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	100%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	2.6%	0%	-	-	-	-	-	-	-	
Bicycles	0	0	0	0	0	-	-	0	0	0	0	0	-	0	1	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycle %	0%	0%	0%	0%	0%	-	-	0%	0%	0%	0%	0%	-	0%	100%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%



Peak Hour: 07:15 AM - 08:15 AM Weather: Scattered Clouds (-0.83 °C)

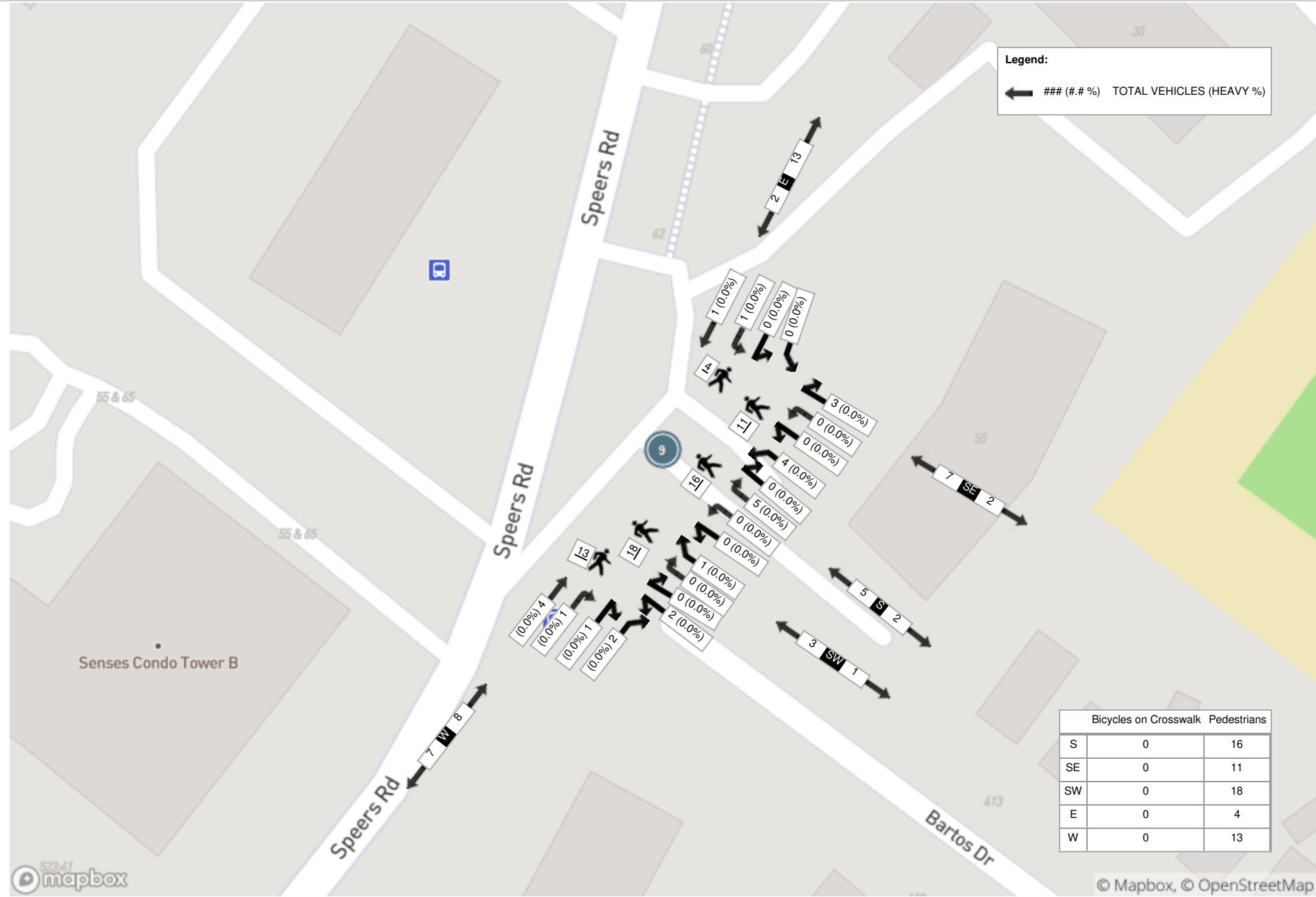
Start Time	SE Approach UG ACCESS							SW Approach SW ACCESS							E Approach 50 SPEERS RD							S Approach INTERNAL ACCESS							W Approach 50 SPEERS RD							Int. Total (15 min)
	Hard Right	Bear Left	Left	Hard Left	UTurn	Peds	Approach Total	Hard Right	Right	Bear Right	Hard Left	UTurn	Peds	Approach Total	Thru	Bear Left	Left	Hard Left	UTurn	Peds	Approach Total	Hard Right	Right	Left	Hard Left	UTurn	Peds	Approach Total	Hard Right	Right	Bear Right	Thru	UTurn	Peds	Approach Total	
07:15:00	1	1	0	0	0	0	2	0	0	0	0	0	3	0	0	0	0	0	0	1	0	0	1	0	0	2	1	0	0	0	5	1	4			
07:30:00	0	0	0	0	0	8	0	0	0	1	1	0	7	2	0	0	1	0	0	2	1	0	2	0	0	9	2	0	0	1	0	0	1	6		
07:45:00	2	1	0	0	0	1	3	0	0	0	1	0	2	1	0	0	0	0	0	0	0	2	0	0	2	2	1	1	0	0	2	2	8			
08:00:00	0	2	0	0	0	2	2	0	0	0	0	0	6	0	1	0	0	0	0	1	1	0	0	0	3	0	0	0	1	3	0	6	7			
Grand Total	3	4	0	0	0	11	7	0	0	1	2	0	18	3	1	0	1	0	0	4	2	0	5	0	0	16	5	1	1	2	4	0	13	8	25	
Approach%	42.9%	57.1%	0%	0%	0%	-	-	0%	0%	33.3%	66.7%	0%	-	50%	0%	50%	0%	0%	-	0%	100%	0%	0%	0%	-	12.5%	12.5%	25%	50%	0%	-	-				
Totals %	12%	16%	0%	0%	0%	28%	12%	0%	0%	4%	8%	0%	12%	4%	0%	4%	0%	0%	8%	0%	20%	0%	0%	0%	20%	4%	4%	8%	16%	0%	32%	-				
PHF	0.38	0.5	0	0	0	0.58	0.38	0	0	0.25	0.5	0	0.38	0.25	0	0.25	0	0	0.5	0	0.63	0	0	0	0.63	0.25	0.25	0.5	0.33	0	0.5	-				
Heavy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-		
Heavy %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-		
Lights	3	4	0	0	0	7	7	0	0	1	2	0	3	3	1	0	1	0	0	2	0	5	0	0	5	5	1	1	2	4	0	8	-			
Lights %	100%	100%	0%	0%	0%	100%	100%	0%	0%	100%	100%	0%	100%	100%	0%	100%	0%	0%	100%	0%	100%	0%	0%	0%	100%	100%	100%	100%	100%	0%	100%	-				
Single-Unit Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-		
Single-Unit Trucks %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-		
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-		
Buses %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-		
Pedestrians	-	-	-	-	-	11	-	-	-	-	-	-	18	-	-	-	-	-	-	4	-	-	-	-	16	-	-	-	-	-	13	-	-			
Pedestrians%	-	-	-	-	-	17.7%	-	-	-	-	-	-	29%	-	-	-	-	-	-	6.5%	-	-	-	-	25.8%	-	-	-	-	-	21%	-	-			
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0	-	-			
Bicycles on Crosswalk%	-	-	-	-	-	0%	-	-	-	-	-	-	0%	-	-	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-	0%	-	-			
Bicycles on Road	0	0	0	0	0	0	-	0	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	0	-	-		
Bicycles on Road%	-	-	-	-	-	0%	-	-	-	-	-	-	0%	-	-	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-	0%	-	-			



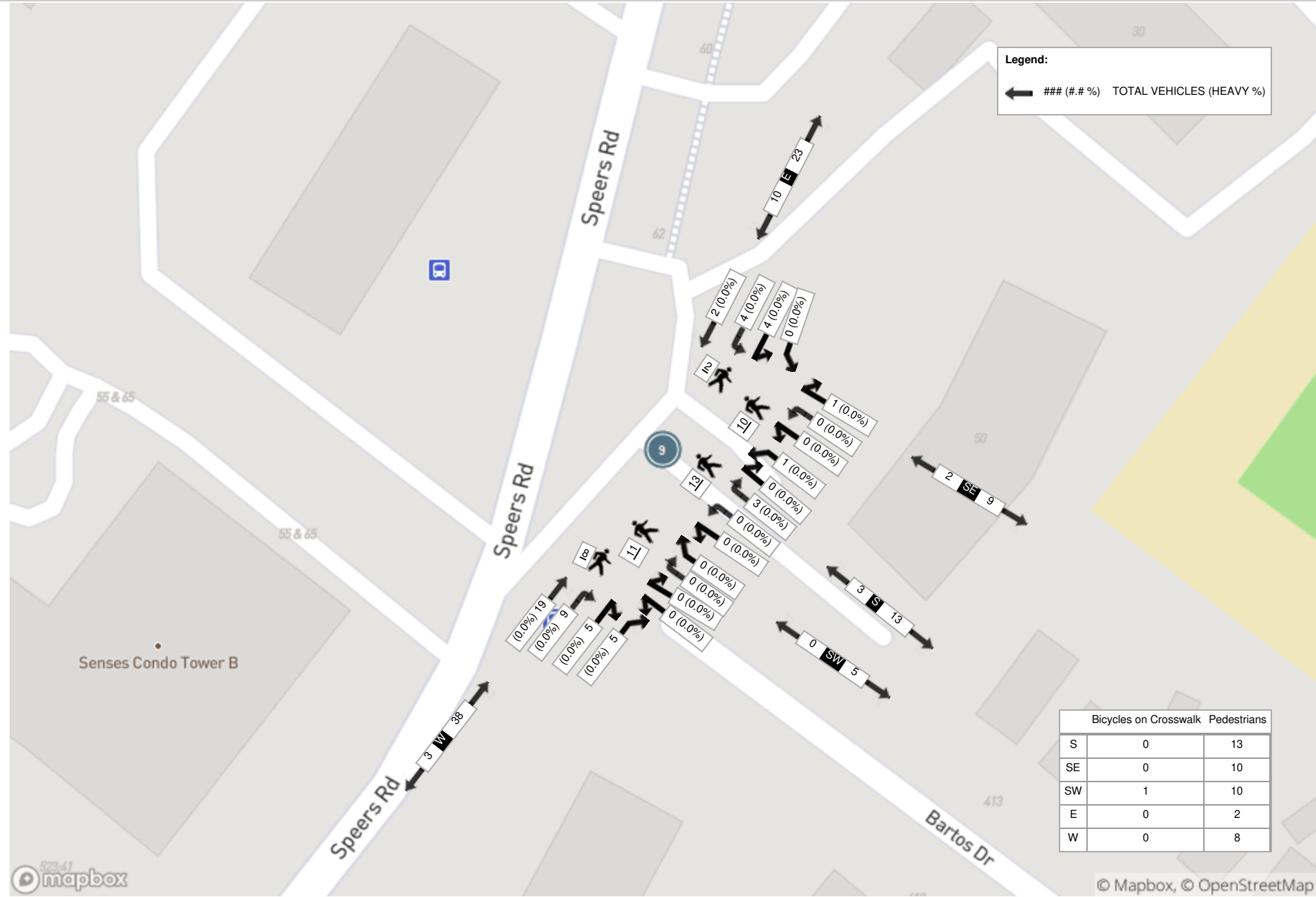
Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (7.39 °C)

Start Time	SE Approach UG ACCESS							SW Approach SW ACCESS							E Approach 50 SPEERS RD							S Approach INTERNAL ACCESS							W Approach 50 SPEERS RD							Int. Total (15 min)
	Hard Right	Bear Left	Left	Hard Left	UTurn	Peds	Approach Total	Hard Right	Right	Bear Right	Hard Left	UTurn	Peds	Approach Total	Thru	Bear Left	Left	Hard Left	UTurn	Peds	Approach Total	Hard Right	Right	Left	Hard Left	UTurn	Peds	Approach Total	Hard Right	Right	Bear Right	Thru	UTurn	Peds	Approach Total	
16:30:00	1	1	0	0	0	2	2	0	0	0	0	0	2	0	0	0	3	1	0	0	4	0	1	0	0	2	1	0	2	1	0	2	10	17		
16:45:00	0	0	0	0	0	1	0	0	0	0	0	0	4	0	0	0	3	0	1	3	0	0	0	0	3	0	3	3	1	3	0	5	10	13		
17:00:00	0	0	0	0	0	4	0	0	0	0	0	0	3	0	1	0	1	0	0	0	2	0	1	0	0	4	1	2	2	1	5	0	10	13		
17:15:00	0	0	0	0	0	3	0	0	0	0	0	0	2	0	1	0	0	1	1	2	0	1	0	0	0	4	1	0	2	2	4	0	1	8	11	
Grand Total	1	1	0	0	0	10	2	0	0	0	0	0	11	0	2	0	4	4	1	2	11	0	3	0	0	0	13	3	5	9	5	19	0	8	38	54
Approach%	50%	50%	0%	0%	0%	-	-	0%	0%	0%	0%	0%	-	18.2%	0%	36.4%	36.4%	9.1%	-	0%	100%	0%	0%	0%	-	13.2%	23.7%	13.2%	50%	0%	-	-	-	-		
Totals %	1.9%	1.9%	0%	0%	0%	3.7%	3.7%	0%	0%	0%	0%	0%	0%	0%	3.7%	0%	7.4%	7.4%	1.9%	20.4%	0%	5.6%	0%	0%	0%	5.6%	9.3%	16.7%	9.3%	35.2%	0%	70.4%	-	-	-	
PHF	0.25	0.25	0	0	0	0.25	0.25	0	0	0	0	0	0	0	0.5	0	0.33	0.33	0.25	0.69	0	0.75	0	0	0	0.75	0.42	0.75	0.63	0.68	0	0.95	-	-	-	
Heavy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	
Heavy %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	9.1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Lights	1	1	0	0	0	2	2	0	0	0	0	0	0	0	2	0	4	4	0	10	0	3	0	0	0	3	5	9	5	19	0	38	-	-	-	
Lights %	100%	100%	0%	0%	0%	100%	100%	0%	0%	0%	0%	0%	0%	0%	100%	0%	100%	100%	0%	90.9%	0%	100%	0%	0%	0%	100%	100%	100%	100%	100%	0%	100%	-	-	-	
Single-Unit Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	
Single-Unit Trucks %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	9.1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	
Buses %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-
Pedestrians	-	-	-	-	-	10	-	-	-	-	-	-	10	-	-	-	-	-	2	-	-	-	-	-	-	13	-	-	-	-	-	-	8	-	-	-
Pedestrians%	-	-	-	-	-	22.7%	-	-	-	-	-	-	22.7%	-	-	-	-	-	4.5%	-	-	-	-	-	-	29.5%	-	-	-	-	-	-	18.2%	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-	-	
Bicycles on Crosswalk%	-	-	-	-	-	0%	-	-	-	-	-	-	2.3%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	-	0%	-	-	-	-
Bicycles on Road	0	0	0	0	0	0	-	0	0	0	0	0	0	-	0	1	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	0	-	-	-	
Bicycles on Road%	-	-	-	-	-	0%	-	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	-	0%	-	-	-	-

Peak Hour: 07:15 AM - 08:15 AM Weather: Scattered Clouds (-0.83 °C)



Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (7.39 °C)





Turning Movement Count (11 . 50 SPEERS RD & INTERNAL WEST DRIVEWAY)

Start Time	N Approach 50 SPEERS RD						E Approach EAST DRIVEWAY					S Approach SOUTH DRIVEWAY					W Approach INTERNAL WEST DRIVEWAY					Int. Total (15 min)	Int. Total (1 hr)			
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N			UTurn W:W	Peds W:	Approach Total
07:00:00	1	0	0	0	1	1	5	0	0	0	0	5	0	0	0	0	0	0	0	3	0	0	0	3	9	
07:15:00	0	0	1	0	1	1	5	0	0	0	1	5	0	1	0	0	1	1	0	1	2	0	0	3	10	
07:30:00	1	0	1	0	1	2	4	0	0	0	1	4	0	1	0	0	6	1	0	0	3	0	1	3	10	
07:45:00	0	0	4	0	1	4	5	0	0	0	3	5	0	1	0	0	2	1	0	0	4	0	0	4	14	43
08:00:00	1	0	1	0	1	2	6	0	0	0	4	6	0	0	0	0	8	0	0	1	2	0	2	3	11	45
08:15:00	0	0	0	0	2	0	4	0	0	0	2	4	0	0	0	0	4	0	0	0	2	0	0	2	6	41
08:30:00	0	0	2	0	0	2	4	0	0	0	4	4	0	0	0	0	3	0	0	1	2	0	1	3	9	40
08:45:00	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	1	1	0	2	2	0	0	4	6	32
BREAK																										
16:00:00	0	0	1	0	0	1	2	0	0	0	1	2	0	0	0	0	2	0	0	2	2	0	0	4	7	
16:15:00	2	0	1	0	0	3	1	0	0	0	4	1	0	2	0	0	2	2	0	1	2	0	0	3	9	
16:30:00	2	0	0	0	0	2	6	0	0	1	1	7	0	2	1	0	2	3	0	7	2	0	0	9	21	
16:45:00	3	0	0	0	1	3	1	0	0	0	2	1	0	1	0	0	1	1	0	3	0	0	0	3	8	45
17:00:00	2	0	1	0	0	3	3	0	0	0	1	3	0	0	0	0	3	0	0	4	1	0	0	5	11	49
17:15:00	1	0	1	0	1	2	1	1	0	0	3	2	1	1	0	0	2	2	0	5	2	0	0	7	13	53
17:30:00	1	0	3	0	1	4	3	0	0	0	2	3	0	0	0	0	6	0	0	2	0	0	0	2	9	41
17:45:00	2	0	4	0	1	6	3	1	0	0	7	4	0	1	0	0	2	1	0	3	1	0	0	4	15	48
Grand Total	16	0	20	0	11	36	54	2	0	1	36	57	1	11	1	0	45	13	0	35	27	0	4	62	168	-
Approach%	44.4%	0%	55.6%	0%	-	-	94.7%	3.5%	0%	1.8%	-	-	7.7%	84.6%	7.7%	0%	-	-	0%	56.5%	43.5%	0%	-	-	-	-
Totals %	9.5%	0%	11.9%	0%	21.4%	-	32.1%	1.2%	0%	0.6%	33.9%	-	0.6%	6.5%	0.6%	0%	7.7%	-	0%	20.8%	16.1%	0%	36.9%	-	-	-
Heavy	1	0	1	0	-	-	0	0	0	0	-	-	0	0	0	0	-	-	0	0	2	0	-	-	-	-
Heavy %	6.3%	0%	5%	0%	-	-	0%	0%	0%	0%	-	-	0%	0%	0%	0%	-	-	0%	0%	7.4%	0%	-	-	-	-
Bicycles	1	0	0	0	-	-	0	0	0	0	-	-	0	0	0	0	-	-	0	0	0	0	-	-	-	-
Bicycle %	6.3%	0%	0%	0%	-	-	0%	0%	0%	0%	-	-	0%	0%	0%	0%	-	-	0%	0%	0%	0%	-	-	-	-



Peak Hour: 07:15 AM - 08:15 AM Weather: Scattered Clouds (-0.83 °C)

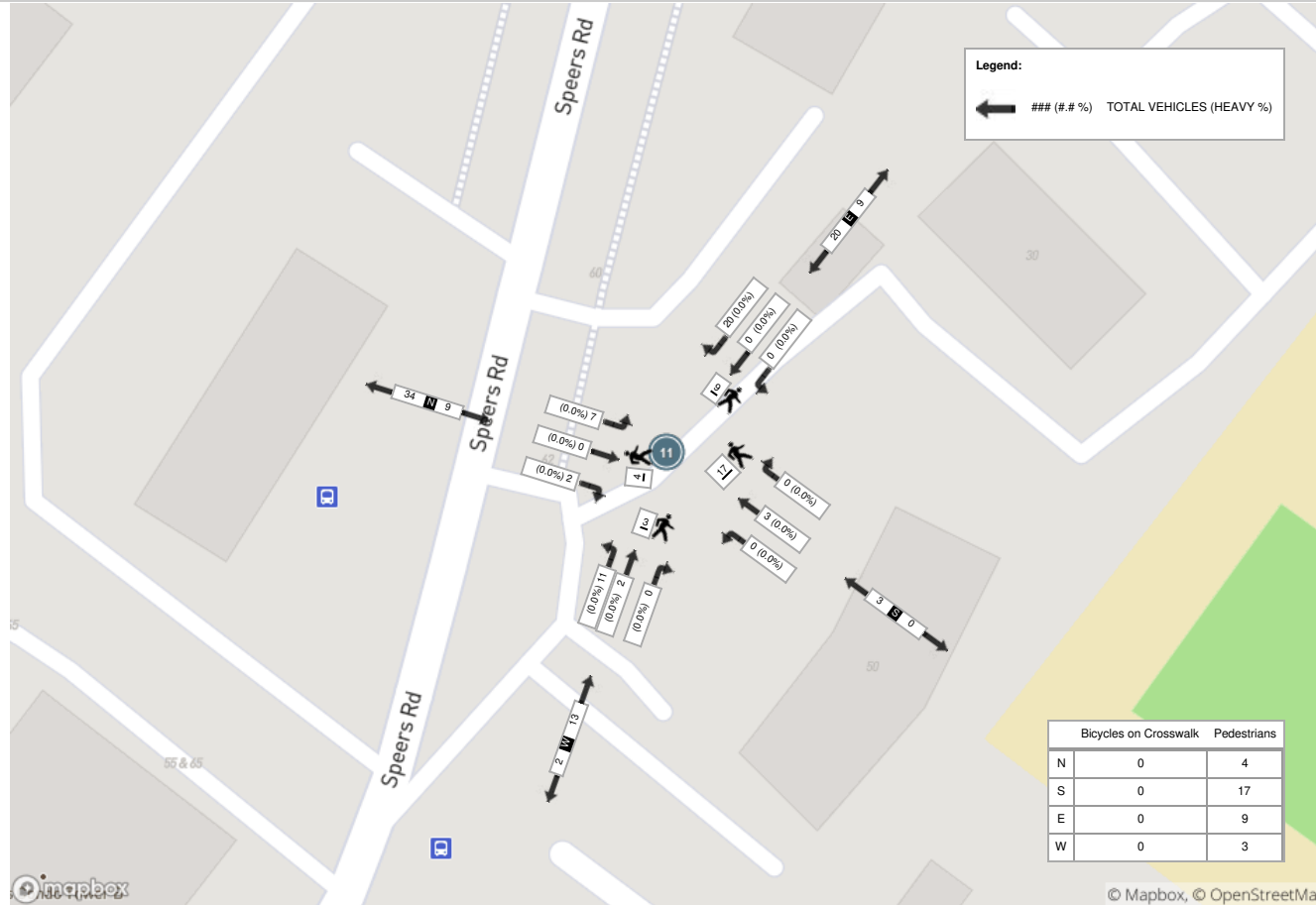
Start Time	N Approach 50 SPEERS RD						E Approach EAST DRIVEWAY						S Approach SOUTH DRIVEWAY						W Approach INTERNAL WEST DRIVEWAY						Int. Total (15 min)	
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total		
07:15:00	0	0	1	0	1	1	5	0	0	0	1	5	0	1	0	0	1	1	0	1	2	0	0	3	10	
07:30:00	1	0	1	0	1	2	4	0	0	0	1	4	0	1	0	0	6	1	0	0	3	0	1	3	10	
07:45:00	0	0	4	0	1	4	5	0	0	0	3	5	0	1	0	0	2	1	0	0	4	0	0	4	14	
08:00:00	1	0	1	0	1	2	6	0	0	0	4	6	0	0	0	0	8	0	0	1	2	0	2	3	11	
Grand Total	2	0	7	0	4	9	20	0	0	0	9	20	0	3	0	0	17	3	0	2	11	0	3	13	45	
Approach%	22.2%	0%	77.8%	0%	-	-	100%	0%	0%	0%	-	-	0%	100%	0%	0%	-	-	0%	15.4%	84.6%	0%	-	-	-	
Totals %	4.4%	0%	15.6%	0%	20%	44.4%	0%	0%	0%	44.4%	0%	6.7%	0%	0%	6.7%	0%	4.4%	24.4%	0%	28.9%	0%	0%	0%	28.9%	-	
PHF	0.5	0	0.44	0	0.56	0.83	0	0	0	0.83	0	0.75	0	0	0.75	0	0.5	0.69	0	0.81	0	0	0	0.81	-	
Heavy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Heavy %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Lights	2	0	7	0	9	20	0	0	0	0	20	0	3	0	0	3	0	2	11	0	13	0	0	0	0	
Lights %	100%	0%	100%	0%	100%	100%	100%	0%	0%	0%	100%	0%	100%	0%	0%	100%	0%	100%	100%	0%	100%	0%	0%	0%	0%	
Single-Unit Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Single-Unit Trucks %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Buses %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
Pedestrians	-	-	-	-	4	-	-	-	-	9	-	-	-	-	17	-	-	-	-	3	-	-	-	-	-	
Pedestrians %	-	-	-	-	12.1%	-	-	-	-	27.3%	-	-	-	-	51.5%	-	-	-	-	9.1%	-	-	-	-	-	
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	
Bicycles on Crosswalk %	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-	
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	0	-	-	
Bicycles on Road %	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-	



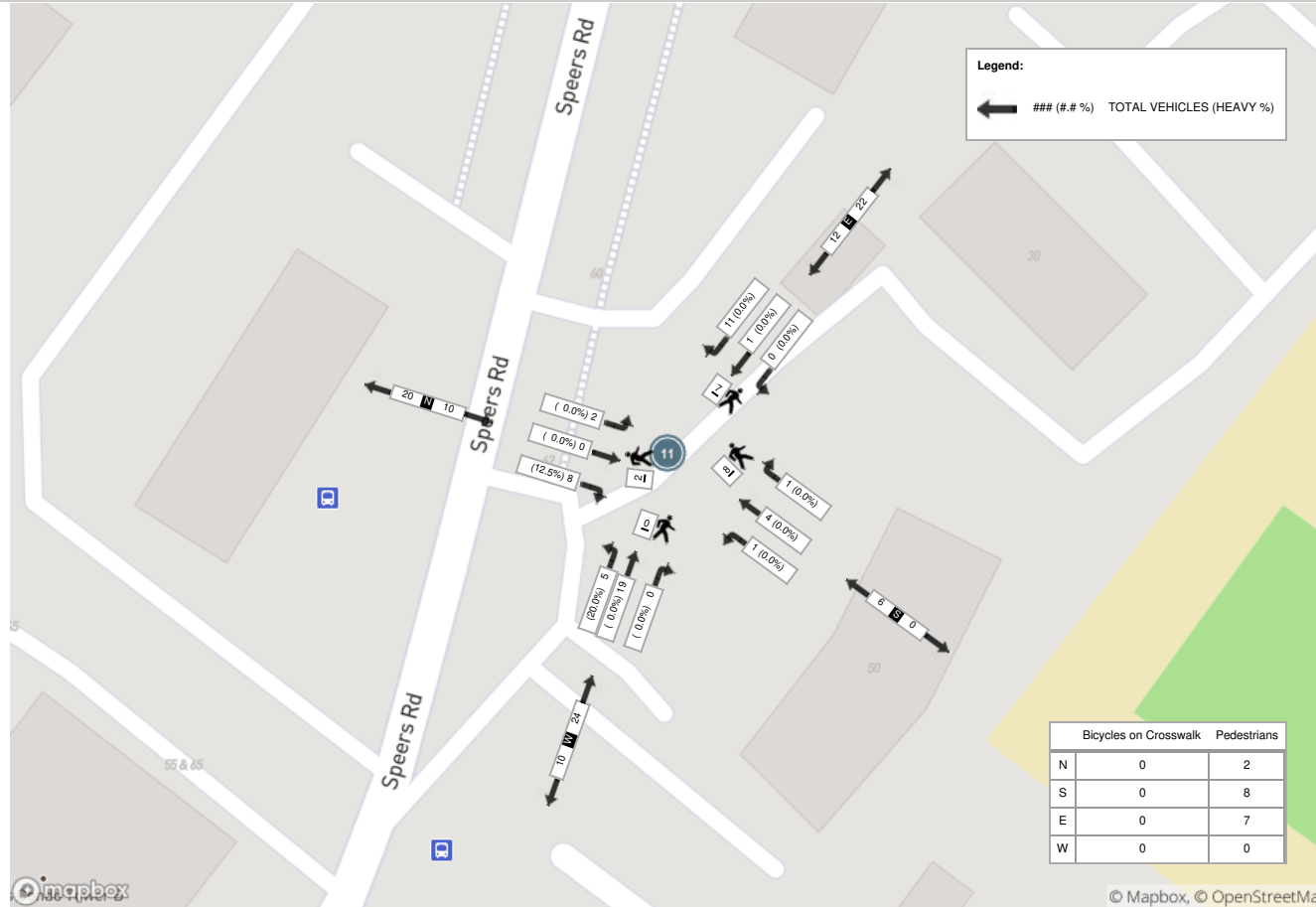
Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (7.39 °C)

Start Time	N Approach 50 SPEERS RD						E Approach EAST DRIVEWAY						S Approach SOUTH DRIVEWAY						W Approach INTERNAL WEST DRIVEWAY						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:30:00	2	0	0	0	0	2	6	0	0	1	1	7	0	2	1	0	2	3	0	7	2	0	0	9	21
16:45:00	3	0	0	0	1	3	1	0	0	0	2	1	0	1	0	0	1	1	0	3	0	0	0	3	8
17:00:00	2	0	1	0	0	3	3	0	0	0	1	3	0	0	0	0	3	0	0	4	1	0	0	5	11
17:15:00	1	0	1	0	1	2	1	1	0	0	3	2	1	1	0	0	2	2	0	5	2	0	0	7	13
Grand Total	8	0	2	0	2	10	11	1	0	1	7	13	1	4	1	0	8	6	0	19	5	0	0	24	53
Approach%	80%	0%	20%	0%	-	-	84.6%	7.7%	0%	7.7%	-	-	16.7%	66.7%	16.7%	0%	-	0%	79.2%	20.8%	0%	-	-	-	-
Totals %	15.1%	0%	3.8%	0%	18.9%	18.9%	20.8%	1.9%	0%	1.9%	24.5%	24.5%	1.9%	7.5%	1.9%	0%	11.3%	0%	35.8%	9.4%	0%	45.3%	-	-	
PHF	0.67	0	0.5	0	0.83	0.83	0.46	0.25	0	0.25	0.46	0.46	0.25	0.5	0.25	0	0.5	0	0.68	0.63	0	0.67	-	-	
Heavy	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	-	
Heavy %	12.5%	0%	0%	0%	10%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	0%	0%	4.2%	-	
Lights	7	0	2	0	9	9	11	1	0	1	13	13	1	4	1	0	6	0	19	4	0	0	23	-	
Lights %	87.5%	0%	100%	0%	90%	90%	100%	100%	0%	100%	100%	100%	100%	100%	100%	0%	100%	0%	100%	80%	0%	0%	95.8%	-	
Single-Unit Trucks	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	-	
Single-Unit Trucks %	12.5%	0%	0%	0%	10%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	0%	0%	4.2%	-	
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	
Buses %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	
Pedestrians	-	-	-	-	2	-	-	-	-	-	7	-	-	-	-	-	8	-	-	-	-	-	0	-	
Pedestrians %	-	-	-	-	11.8%	-	-	-	-	-	41.2%	-	-	-	-	-	47.1%	-	-	-	-	-	0%	-	
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	
Bicycles on Crosswalk %	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	
Bicycles on Road	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	
Bicycles on Road %	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	

Peak Hour: 07:15 AM - 08:15 AM Weather: Scattered Clouds (-0.83 °C)



Peak Hour: 04:30 PM - 05:30 PM Weather: Overcast Clouds (7.39 °C)

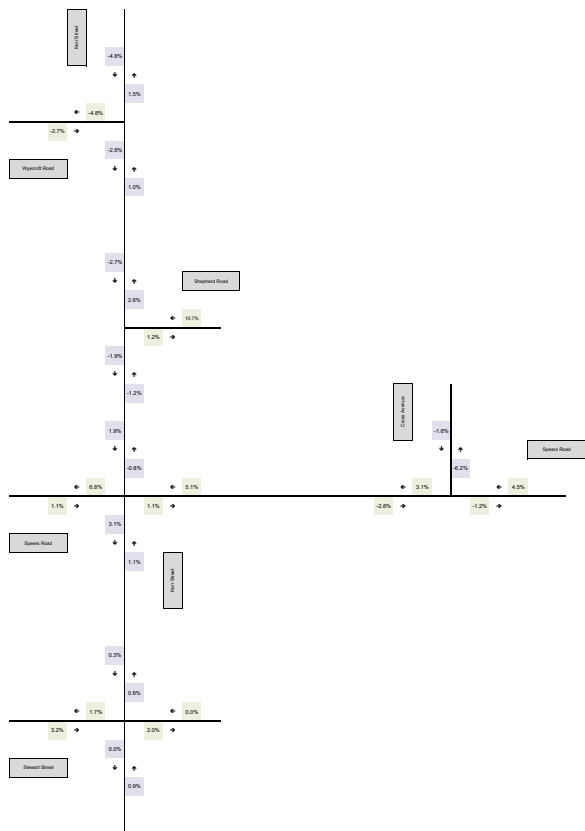


Appendix E

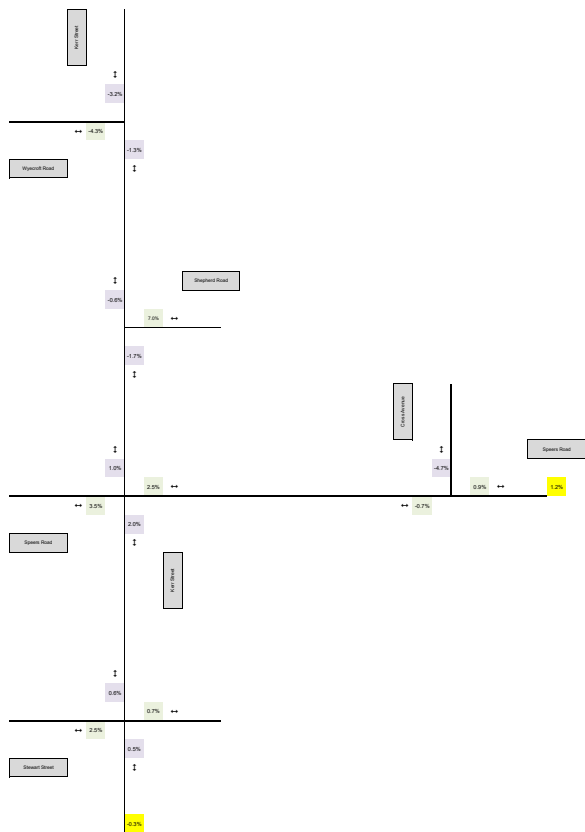
Corridor Growth Analysis



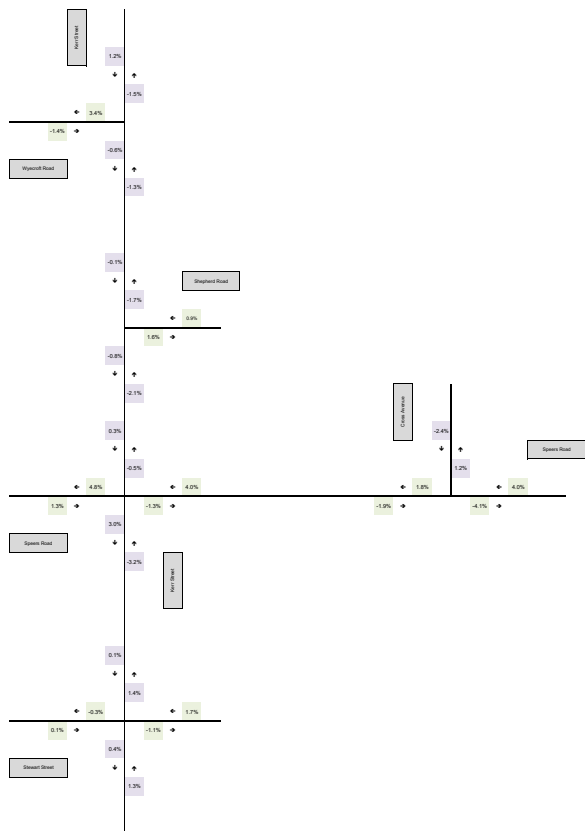
BACKGROUND TRAFFIC GROWTH RATES - AM PEAK



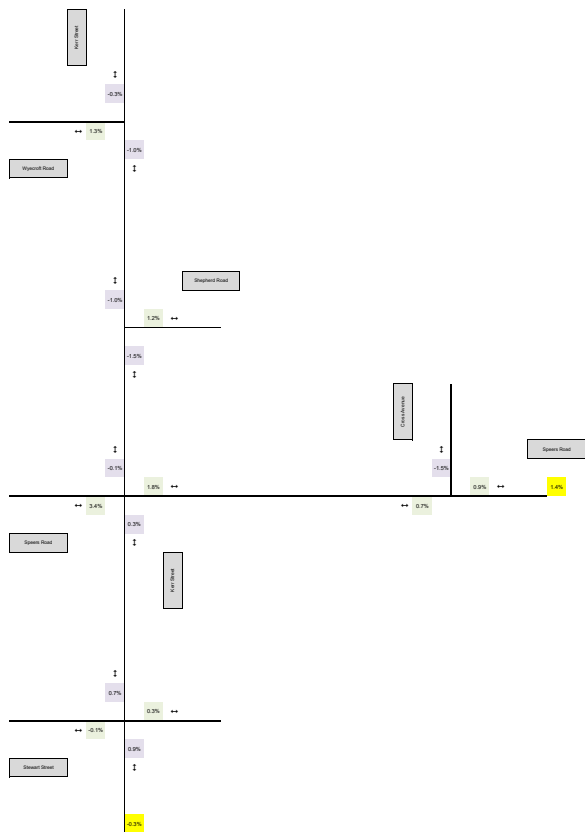
BACKGROUND TRAFFIC GROWTH RATES (2-WAY) - AM PEAK



BACKGROUND TRAFFIC GROWTH RATES - PM PEAK



BACKGROUND TRAFFIC GROWTH RATES (2-WAY) - PM PEAK



Project: 50 Speers Road, Oakville
Project ID: 8013-02
Intersection: Speers Road / Kerr St
Peak Hour: AM Peak

North of Intersection				
Date	Year	Northbound	Southbound	2-Way
Thursday May 17	2012	324	565	889
Monday September 29	2014	323	552	875
Tuesday November 15	2016	299	823	1122
Thursday May 9	2019	311	594	905

Trend Point at start		322.3	594.8	917.1
Trend Point at end		305.0	678.1	983.1
Slope		-2.5	11.9	9.4
Annual Growth		-0.8%	1.9%	1.0%

South of Intersection				
Date	Year	Northbound	Southbound	2-Way
Thursday May 17	2012	494	375	869
Monday September 29	2014	545	395	940
Tuesday November 15	2016	478	390	868
Thursday May 9	2019	553	469	1022

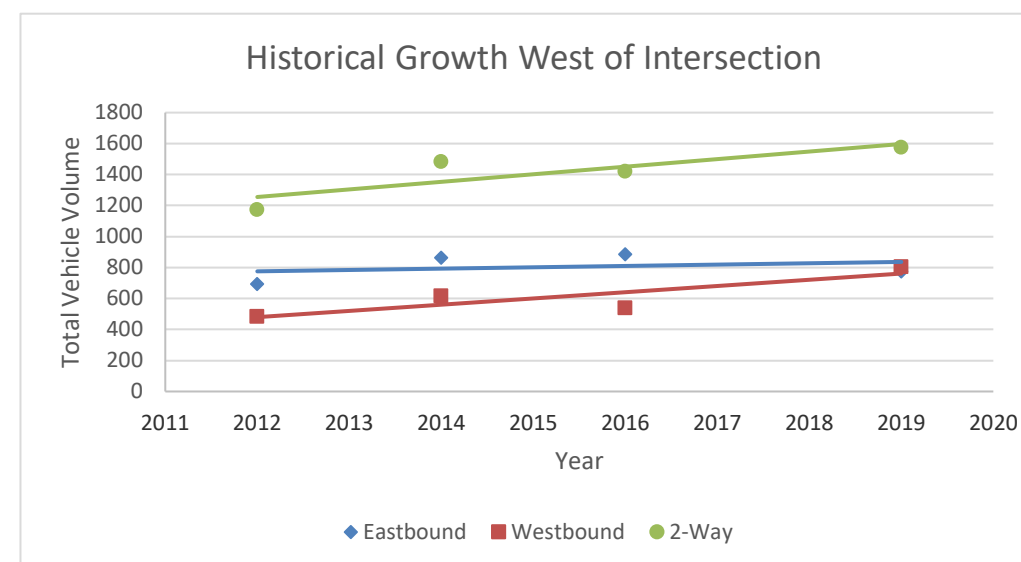
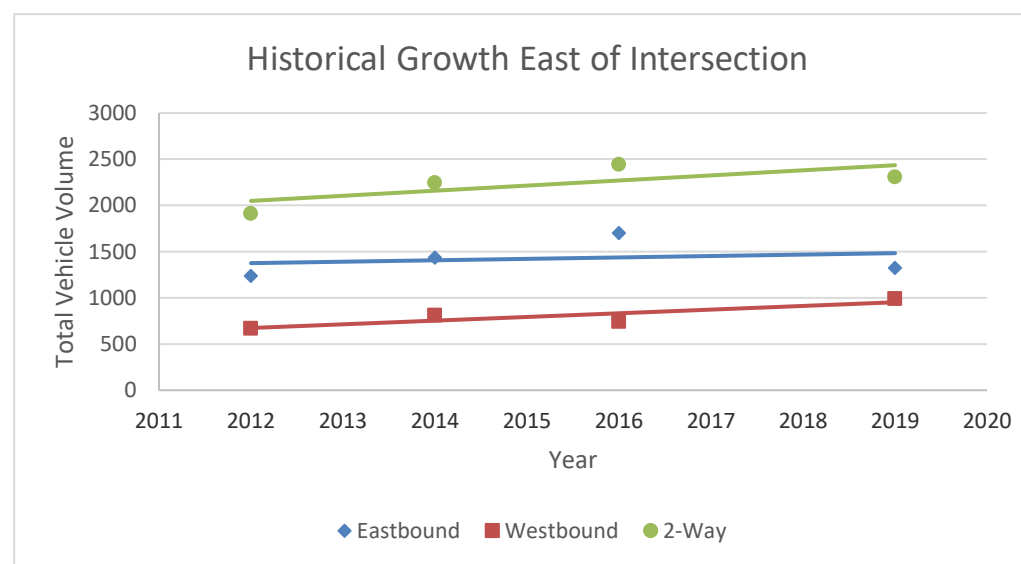
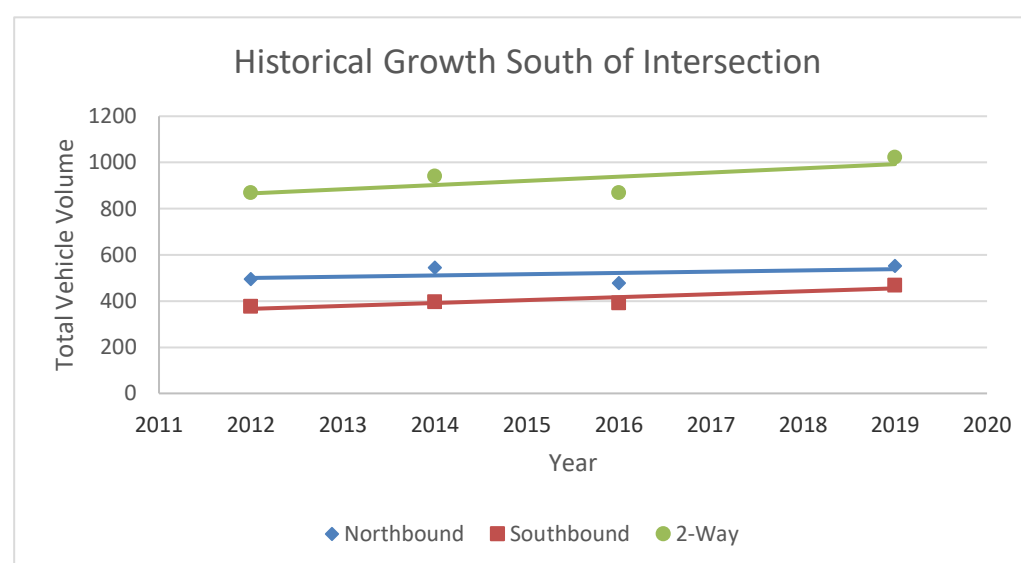
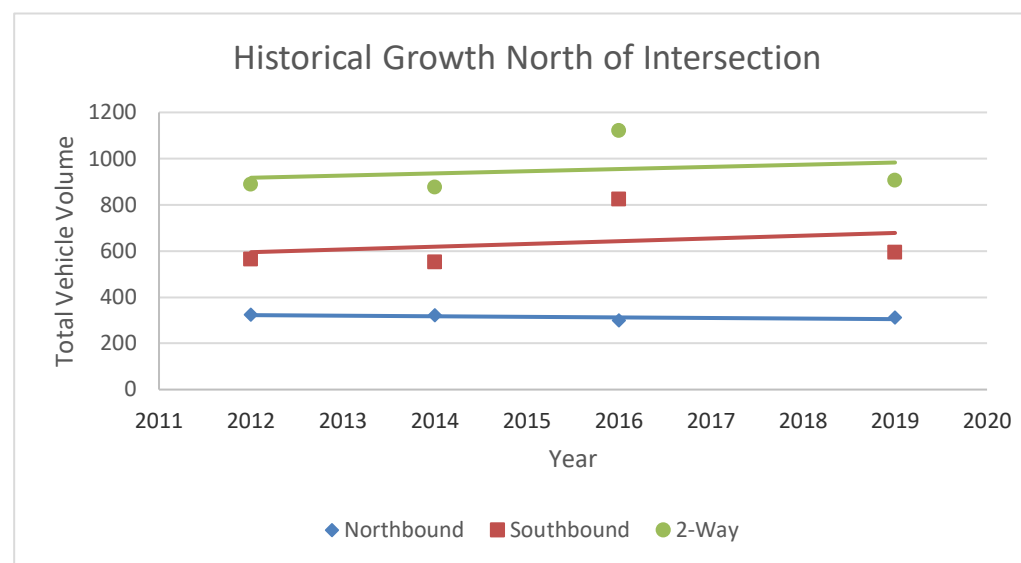
Trend Point at start		499.8	366.1	865.9
Trend Point at end		537.9	454.7	992.6
Slope		5.4	12.7	18.1
Annual Growth		1.1%	3.1%	2.0%

East of Intersection				
Date	Year	Eastbound	Westbound	2-Way
Thursday May 17	2012	1240	671	1911
Monday September 29	2014	1437	811	2248
Tuesday November 15	2016	1703	743	2446
Thursday May 9	2019	1323	987	2310

Trend Point at start		1375.7	673.7	2049.4
Trend Point at end		1483.5	952.2	2435.7
Slope		15.4	39.8	55.2
Annual Growth		1.1%	5.1%	2.5%

West of Intersection				
Date	Year	Eastbound	Westbound	2-Way
Thursday May 17	2012	692	483	1175
Monday September 29	2014	865	618	1483
Tuesday November 15	2016	885	537	1422
Thursday May 9	2019	773	804	1577

Trend Point at start		775.5	479.8	1255.4
Trend Point at end		836.3	761.3	1597.6
Slope		8.7	40.2	48.9
Annual Growth		1.1%	6.8%	3.5%



Project: 50 Speers Road, Oakville
Project ID: 8013-02
Intersection: Speers Road / Kerr St
Peak Hour: PM Peak

North of Intersection				
Date	Year	Northbound	Southbound	2-Way
Thursday May 17	2012	691	869	1560
Monday September 29	2014	930	689	1619
Tuesday November 15	2016	790	855	1645
Thursday May 9	2019	725	827	1552

Trend Point at start		795.8	803.1	1598.9
Trend Point at end		770.4	818.0	1588.4
Slope		-3.6	2.1	-1.5
Annual Growth		-0.5%	0.3%	-0.1%

South of Intersection				
Date	Year	Northbound	Southbound	2-Way
Thursday May 17	2012	779	734	1513
Monday September 29	2014	546	759	1305
Tuesday November 15	2016	423	761	1184
Thursday May 9	2019	634	902	1536

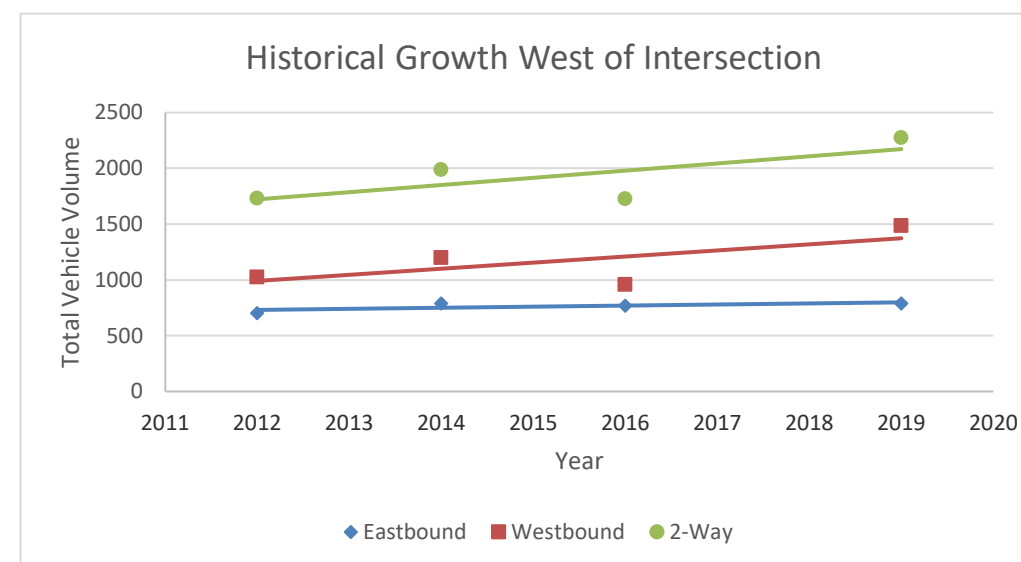
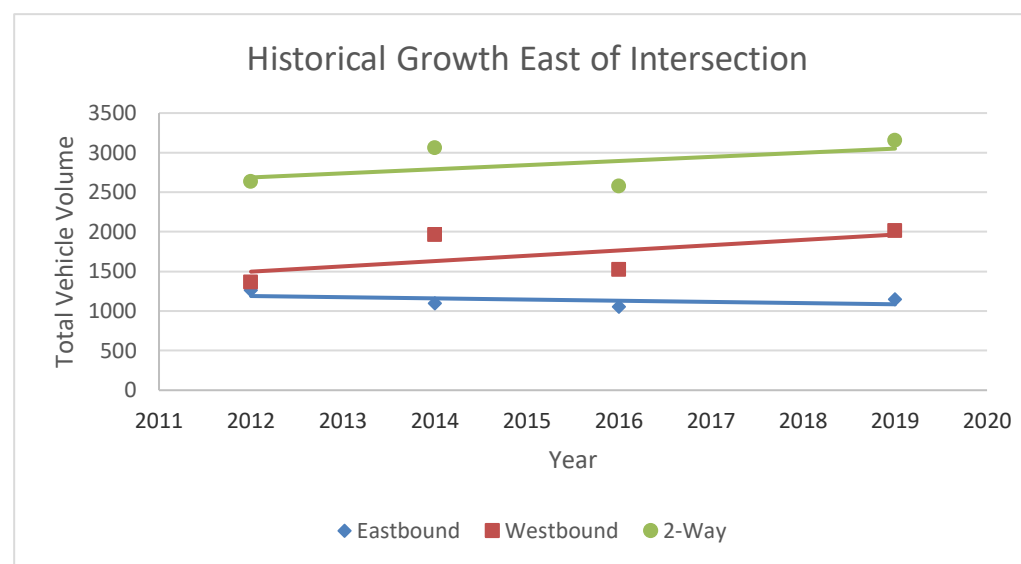
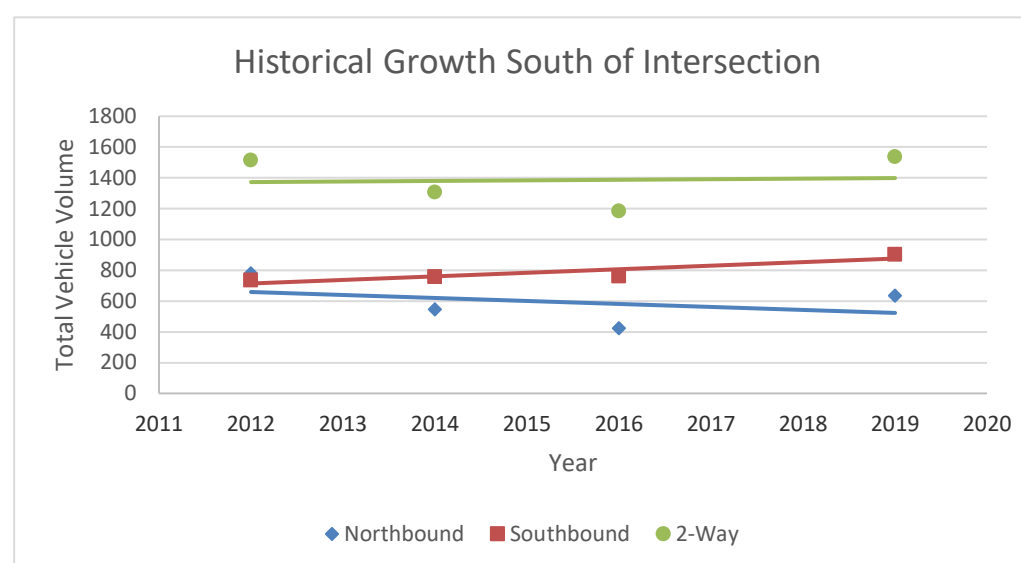
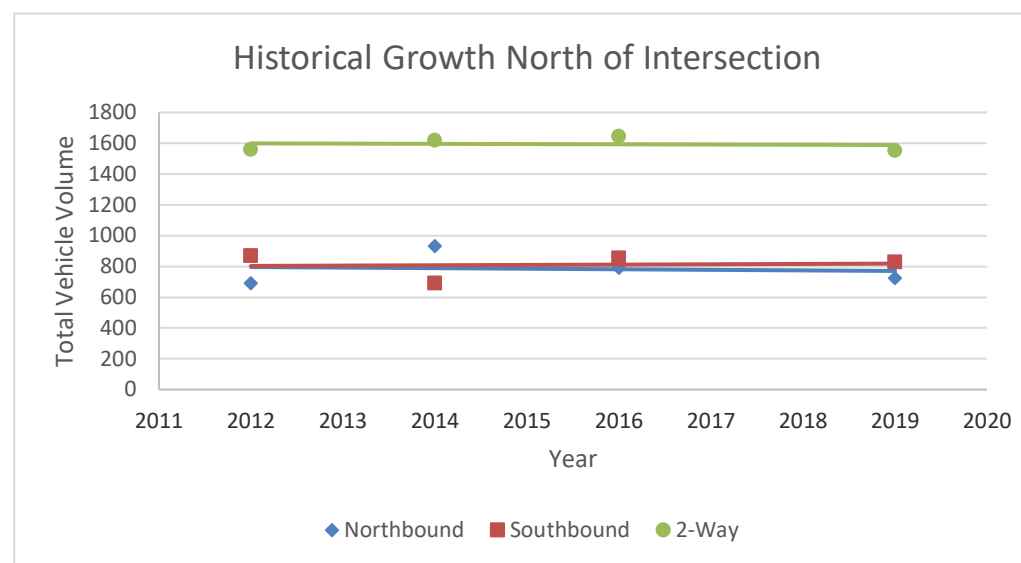
Trend Point at start		658.6	713.8	1372.4
Trend Point at end		522.7	875.8	1398.4
Slope		-19.4	23.1	3.7
Annual Growth		-3.2%	3.0%	0.3%

East of Intersection				
Date	Year	Eastbound	Westbound	2-Way
Thursday May 17	2012	1266	1366	2632
Monday September 29	2014	1098	1962	3060
Tuesday November 15	2016	1055	1520	2575
Thursday May 9	2019	1146	2011	3157

Trend Point at start		1189.6	1497.4	2687.0
Trend Point at end		1085.4	1965.6	3051.0
Slope		-14.9	66.9	52.0
Annual Growth		-1.3%	4.0%	1.8%

West of Intersection				
Date	Year	Eastbound	Westbound	2-Way
Thursday May 17	2012	704	1027	1731
Monday September 29	2014	790	1200	1990
Tuesday November 15	2016	768	960	1728
Thursday May 9	2019	789	1488	2277

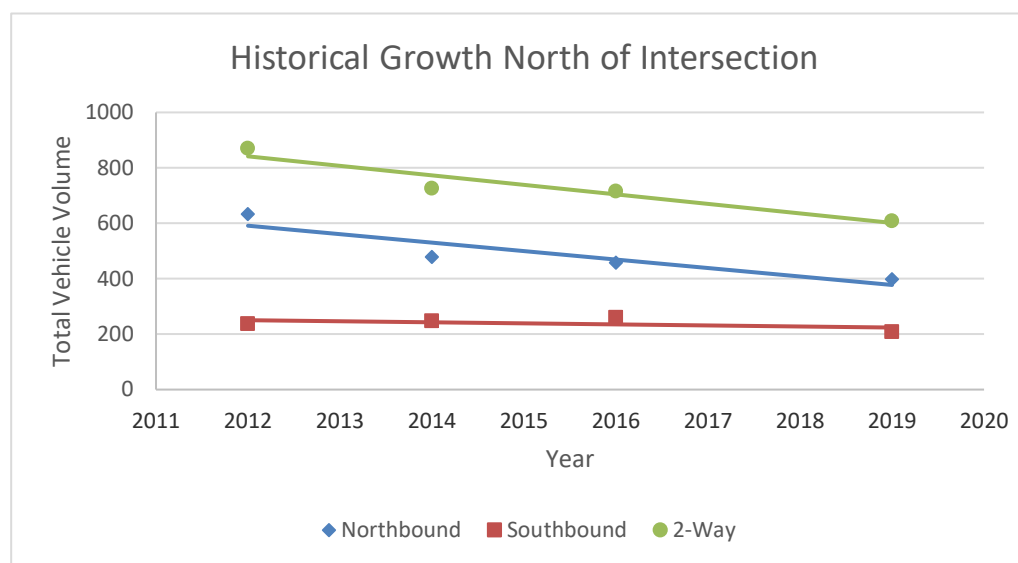
Trend Point at start		731.3	991.1	1722.3
Trend Point at end		799.1	1373.7	2172.8
Slope		9.7	54.7	64.4
Annual Growth		1.3%	4.8%	3.4%



Project: 50 Speers Road, Oakville
Project ID: 8013-02
Intersection: Speers Road / Cross Ave
Peak Hour: AM Peak

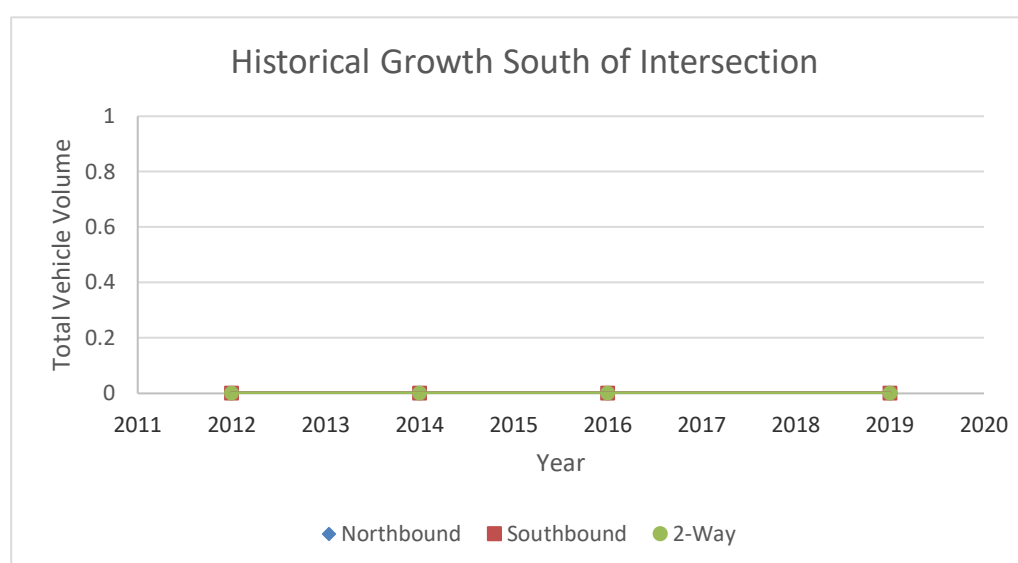
North of Intersection				
Date	Year	Northbound	Southbound	2-Way
Tuesday May 8	2012	633	237	870
Monday October 6	2014	479	247	726
Thursday November 3	2016	457	259	716
Monday May 27	2019	399	209	608

Trend Point at start		591.3	250.3	841.5
Trend Point at end		377.5	223.8	601.3
Slope		-30.5	-3.8	-34.3
Annual Growth		-6.2%	-1.6%	-4.7%



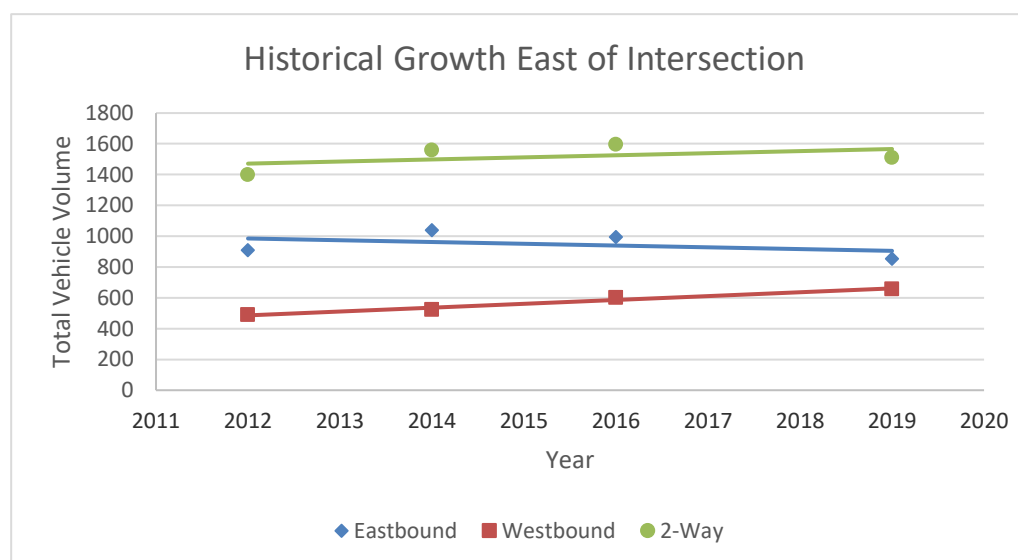
South of Intersection				
Date	Year	Northbound	Southbound	2-Way
Tuesday May 8	2012	0	0	0
Monday October 6	2014	0	0	0
Thursday November 3	2016	0	0	0
Monday May 27	2019	0	0	0

Trend Point at start		0.0	0.0	0.0
Trend Point at end		0.0	0.0	0.0
Slope		0.0	0.0	0.0
Annual Growth		#DIV/0!	#DIV/0!	#DIV/0!



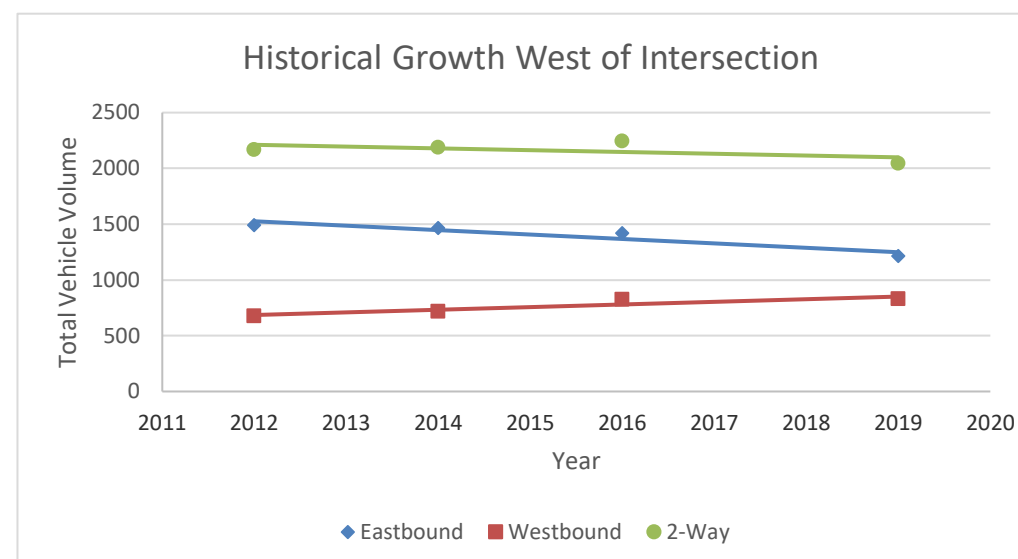
East of Intersection				
Date	Year	Eastbound	Westbound	2-Way
Tuesday May 8	2012	908	490	1398
Monday October 6	2014	1038	522	1560
Thursday November 3	2016	995	601	1596
Monday May 27	2019	852	657	1509

Trend Point at start		985.6	486.2	1471.7
Trend Point at end		905.2	661.4	1566.5
Slope		-11.5	25.0	13.5
Annual Growth		-1.2%	4.5%	0.9%



West of Intersection				
Date	Year	Eastbound	Westbound	2-Way
Tuesday May 8	2012	1490	676	2166
Monday October 6	2014	1467	719	2186
Thursday November 3	2016	1417	825	2242
Monday May 27	2019	1214	829	2043

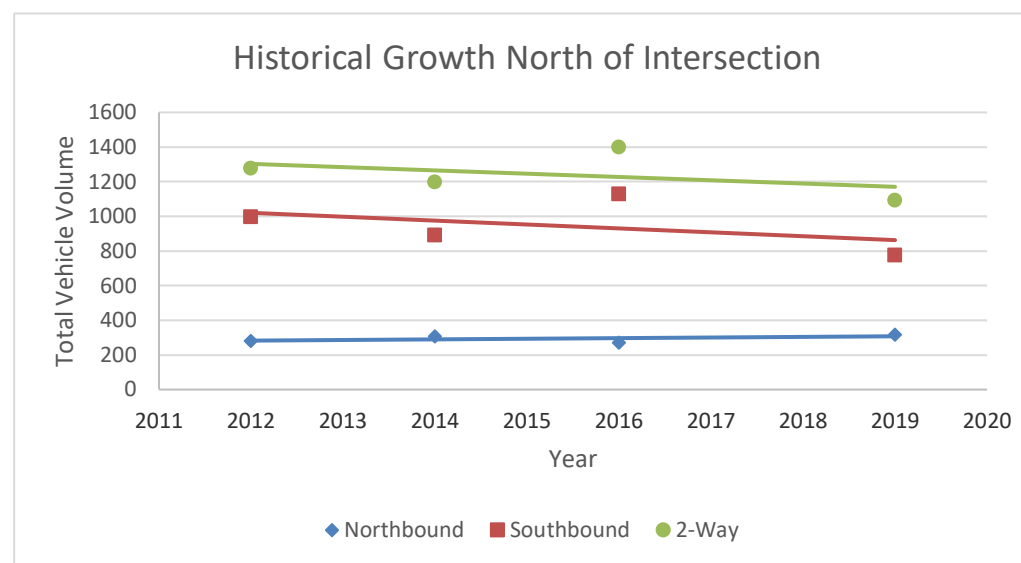
Trend Point at start		1525.9	685.5	2211.4
Trend Point at end		1248.3	850.8	2099.1
Slope		-39.7	23.6	-16.0
Annual Growth		-2.8%	3.1%	-0.7%



Project: 50 Speers Road, Oakville
Project ID: 8013-02
Intersection: Speers Road / Cross Ave
Peak Hour: PM Peak

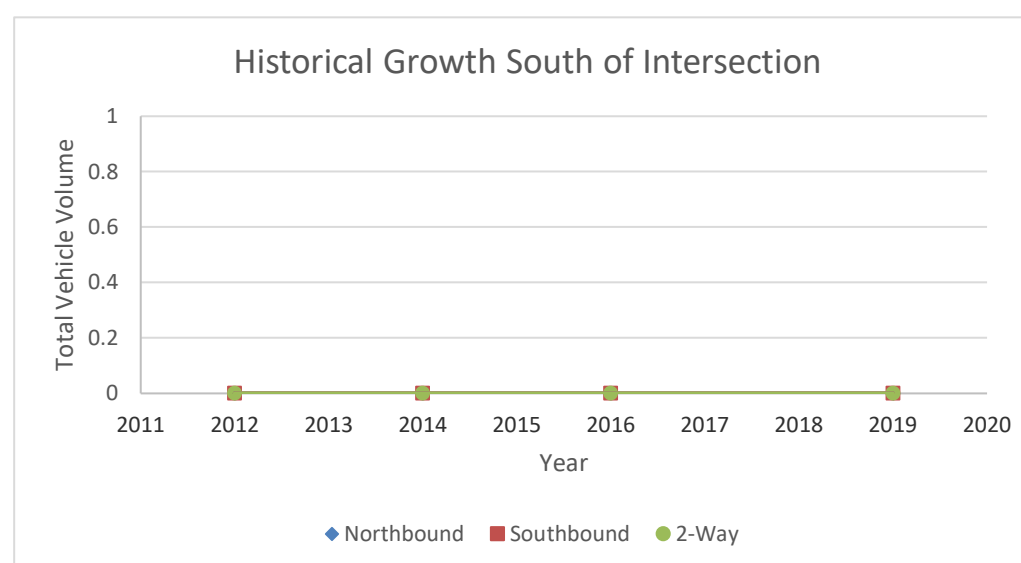
North of Intersection				
Date	Year	Northbound	Southbound	2-Way
Tuesday May 8	2012	281	996	1277
Monday October 6	2014	307	891	1198
Thursday November 3	2016	272	1128	1400
Monday May 27	2019	317	774	1091

Trend Point at start		282.6	1020.4	1303.0
Trend Point at end		307.7	862.8	1170.5
Slope		3.6	-22.5	-18.9
Annual Growth		1.2%	-2.4%	-1.5%



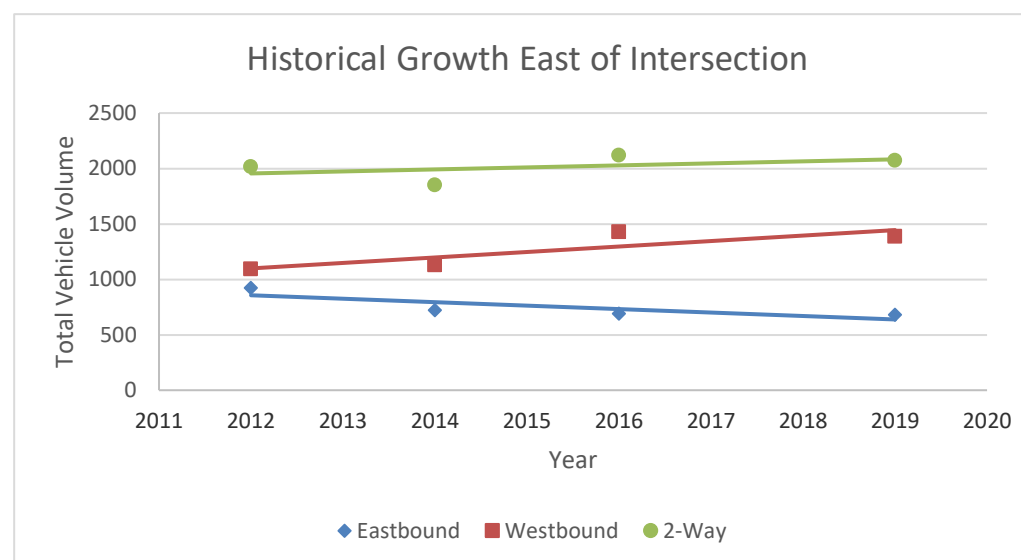
South of Intersection				
Date	Year	Northbound	Southbound	2-Way
Tuesday May 8	2012	0	0	0
Monday October 6	2014	0	0	0
Thursday November 3	2016	0	0	0
Monday May 27	2019	0	0	0

Trend Point at start		0.0	0.0	0.0
Trend Point at end		0.0	0.0	0.0
Slope		0.0	0.0	0.0
Annual Growth		#DIV/0!	#DIV/0!	#DIV/0!



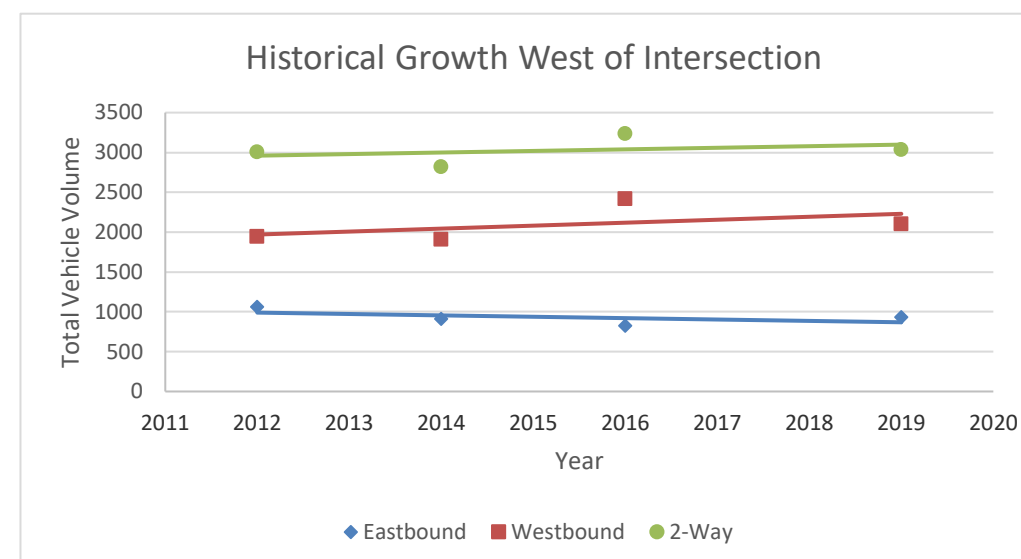
East of Intersection				
Date	Year	Eastbound	Westbound	2-Way
Tuesday May 8	2012	925	1091	2016
Monday October 6	2014	723	1130	1853
Thursday November 3	2016	691	1427	2118
Monday May 27	2019	682	1389	2071

Trend Point at start		856.6	1098.8	1955.4
Trend Point at end		638.3	1444.4	2082.7
Slope		-31.2	49.4	18.2
Annual Growth		-4.1%	4.0%	0.9%



West of Intersection				
Date	Year	Eastbound	Westbound	2-Way
Tuesday May 8	2012	1061	1942	3003
Monday October 6	2014	914	1905	2819
Thursday November 3	2016	823	2415	3238
Monday May 27	2019	936	2100	3036

Trend Point at start		989.8	1969.8	2959.6
Trend Point at end		868.5	2229.8	3098.3
Slope		-17.3	37.1	19.8
Annual Growth		-1.9%	1.8%	0.7%



Project: 50 Speers Road, Oakville
Project ID: 8013-02
Intersection: Kerr St / Shepherd Road
Peak Hour: AM Peak

North of Intersection				
Date	Year	Northbound	Southbound	2-Way
Wednesday November 2	2011	375	602	977
Thursday November 19	2015	356	606	962
Thursday April 19	2018	450	486	936

Trend Point at start		357.4	621.9	979.4
Trend Point at end		426.6	512.6	939.2
Slope		9.9	-15.6	-5.7
Annual Growth		2.6%	-2.7%	-0.6%

South of Intersection				
Date	Year	Northbound	Southbound	2-Way
Wednesday November 2	2011	312	580	892
Thursday November 19	2015	272	575	847
Thursday April 19	2018	289	503	792

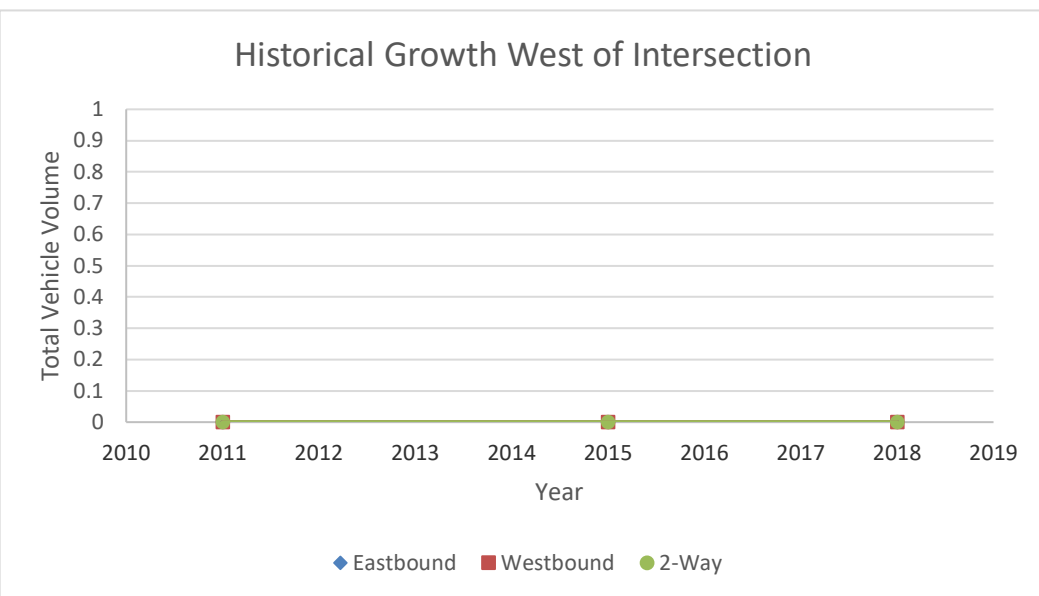
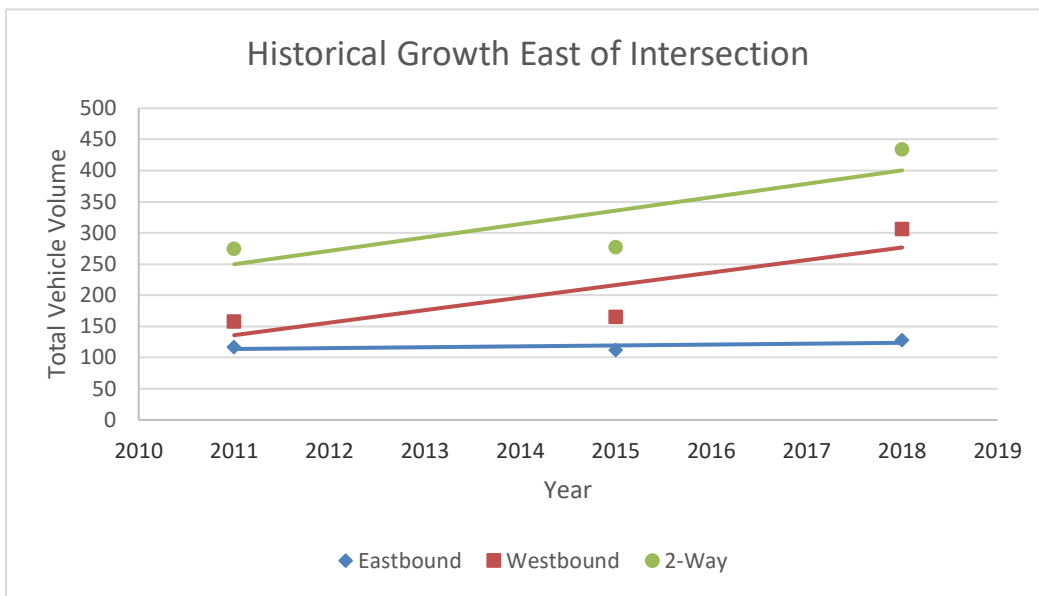
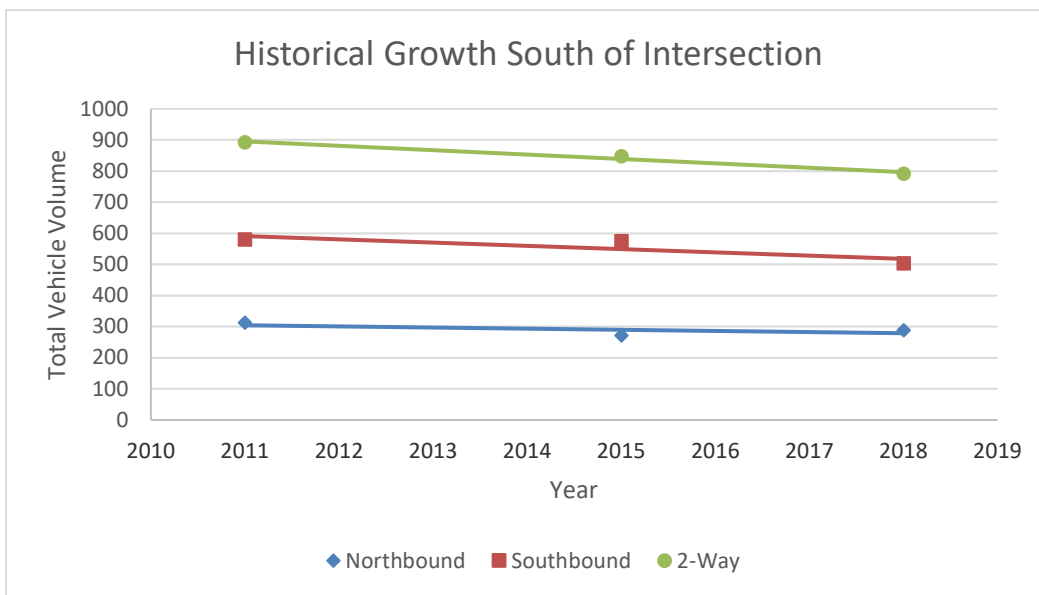
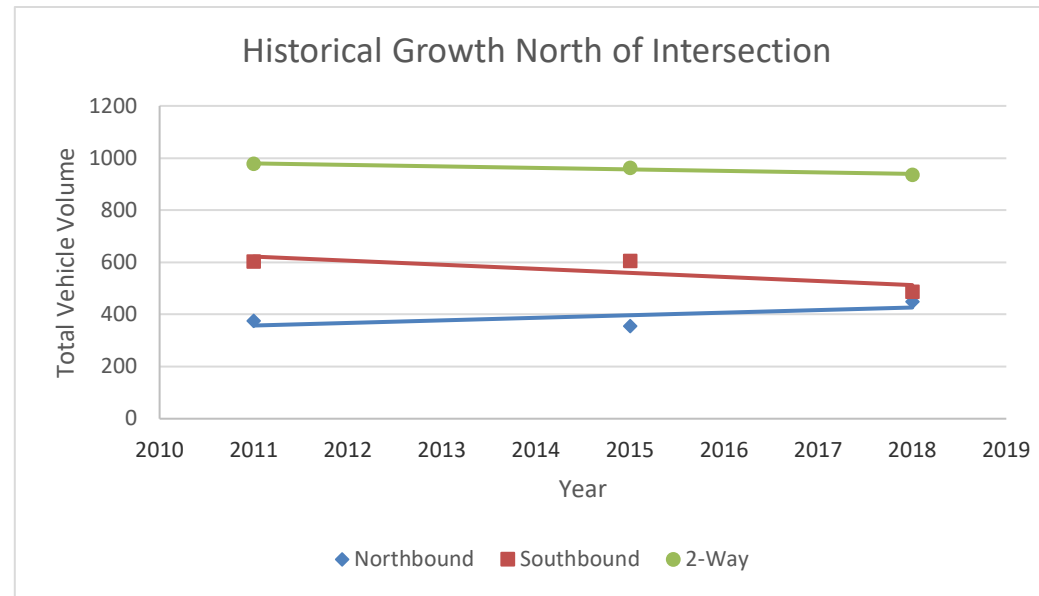
Trend Point at start		304.4	591.1	895.4
Trend Point at end		278.8	517.8	796.6
Slope		-3.6	-10.5	-14.1
Annual Growth		-1.2%	-1.9%	-1.7%

East of Intersection				
Date	Year	Eastbound	Westbound	2-Way
Wednesday November 2	2011	117	158	275
Thursday November 19	2015	112	165	277
Thursday April 19	2018	128	306	434

Trend Point at start		113.8	136.0	249.8
Trend Point at end		123.7	276.6	400.4
Slope		1.4	20.1	21.5
Annual Growth		1.2%	10.7%	7.0%

West of Intersection				
Date	Year	Eastbound	Westbound	2-Way
Wednesday November 2	2011	0	0	0
Thursday November 19	2015	0	0	0
Thursday April 19	2018	0	0	0

Trend Point at start		0.0	0.0	0.0
Trend Point at end		0.0	0.0	0.0
Slope		0.0	0.0	0.0
Annual Growth		#DIV/0!	#DIV/0!	#DIV/0!



Project: 50 Speers Road, Oakville
Project ID: 8013-02
Intersection: Kerr St / Shepherd Road
Peak Hour: PM Peak

North of Intersection				
Date	Year	Northbound	Southbound	2-Way
Wednesday November 2	2011	799	594	1393
Thursday November 19	2015	939	631	1570
Thursday April 19	2018	683	584	1267

Trend Point at start		857.5	606.1	1463.7
Trend Point at end		761.1	600.2	1361.2
Slope		-13.8	-0.9	-14.6
Annual Growth		-1.7%	-0.1%	-1.0%

South of Intersection				
Date	Year	Northbound	Southbound	2-Way
Wednesday November 2	2011	765	553	1318
Thursday November 19	2015	845	565	1410
Thursday April 19	2018	640	519	1159

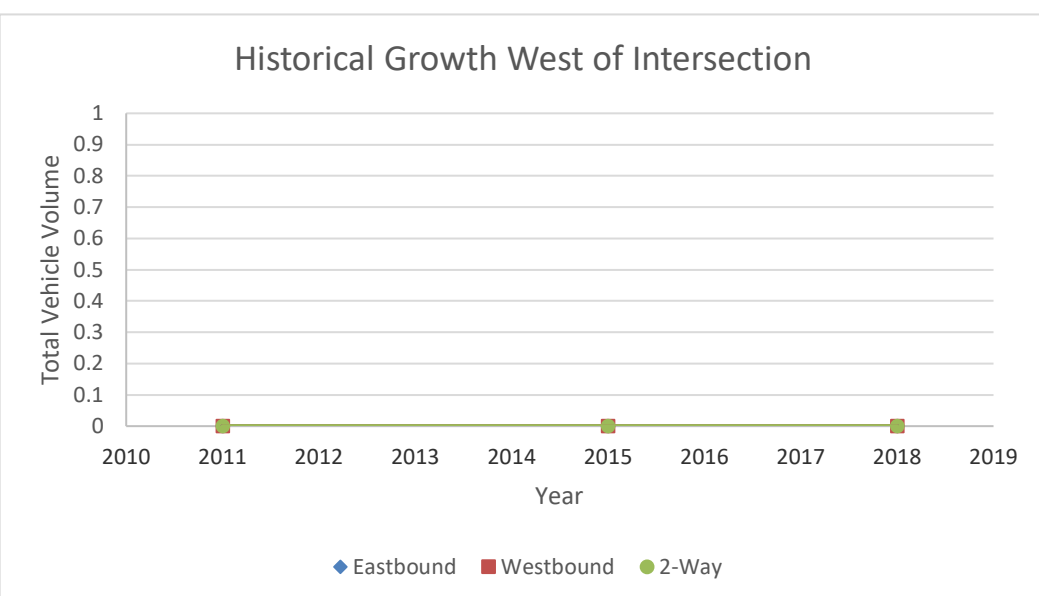
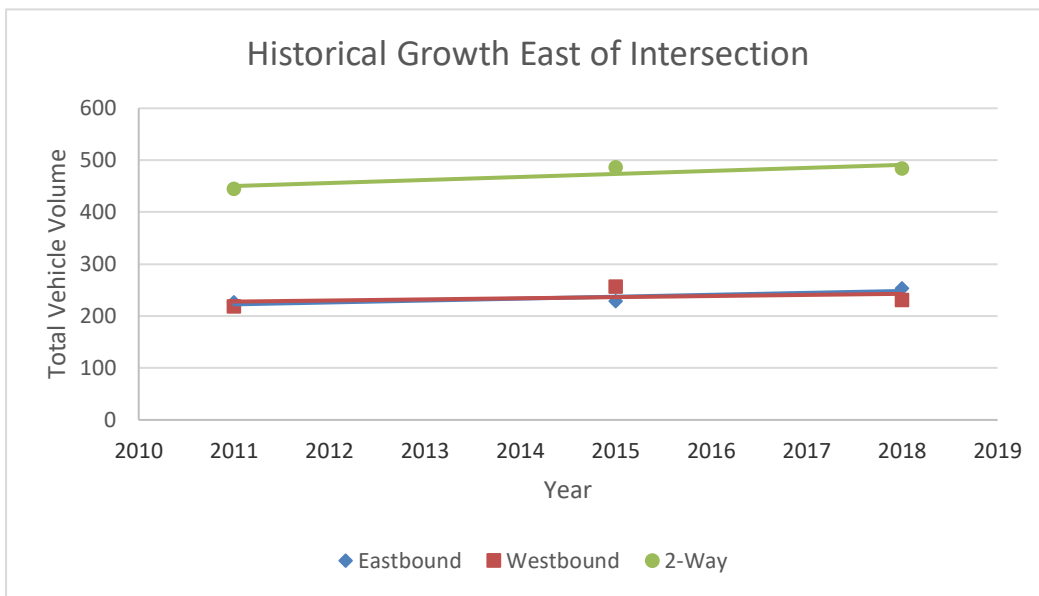
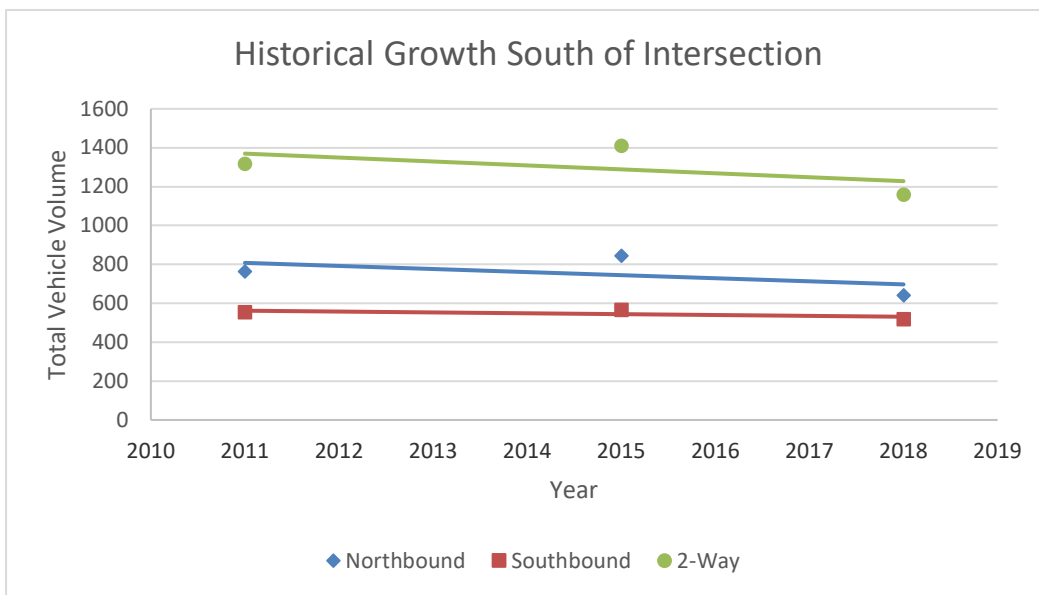
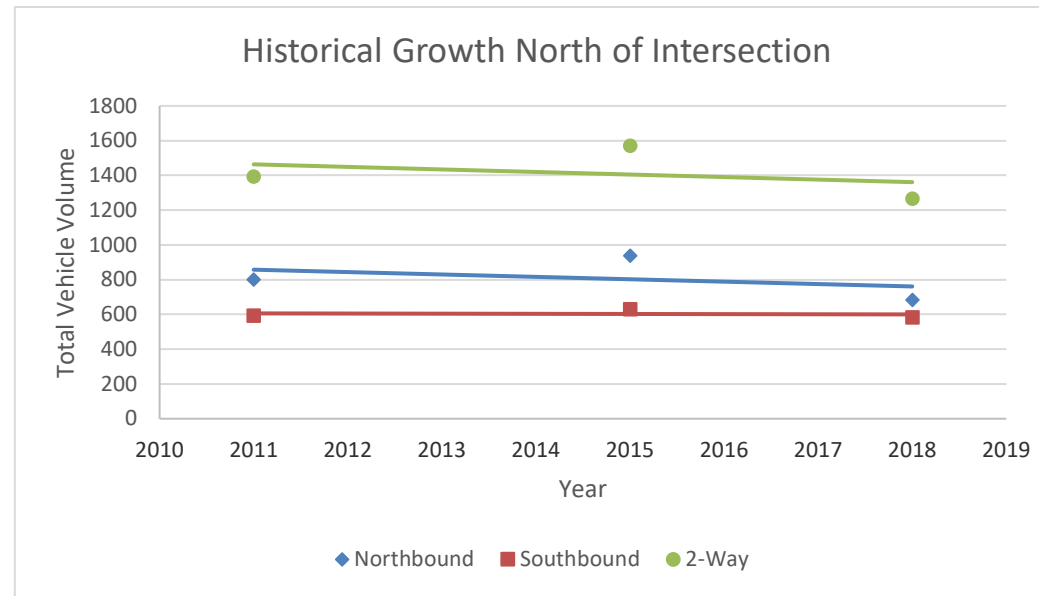
Trend Point at start		808.0	561.9	1369.9
Trend Point at end		697.3	530.9	1228.2
Slope		-15.8	-4.4	-20.2
Annual Growth		-2.1%	-0.8%	-1.5%

East of Intersection				
Date	Year	Eastbound	Westbound	2-Way
Wednesday November 2	2011	226	219	445
Thursday November 19	2015	229	257	486
Thursday April 19	2018	253	231	484

Trend Point at start		222.5	227.8	450.3
Trend Point at end		248.3	242.8	491.1
Slope		3.7	2.1	5.8
Annual Growth		1.6%	0.9%	1.2%

West of Intersection				
Date	Year	Eastbound	Westbound	2-Way
Wednesday November 2	2011	0	0	0
Thursday November 19	2015	0	0	0
Thursday April 19	2018	0	0	0

Trend Point at start		0.0	0.0	0.0
Trend Point at end		0.0	0.0	0.0
Slope		0.0	0.0	0.0
Annual Growth		#DIV/0!	#DIV/0!	#DIV/0!



Project: 50 Speers Road, Oakville
Project ID: 8013-02
Intersection: Kerr St. / Wycroft Road
Peak Hour: AM Peak

North of Intersection				
Date	Year	Northbound	Southbound	2-Way
Wednesday October 15	2014	199	718	917
Monday May 16	2016	239	709	948
Monday April 15	2019	220	565	785

Trend Point at start		211.5	738.6	950.1
Trend Point at end		228.3	578.7	807.1
Slope		3.4	-32.0	-28.6
Annual Growth		1.5%	-4.8%	-3.2%

South of Intersection				
Date	Year	Northbound	Southbound	2-Way
Wednesday October 15	2014	385	627	1012
Monday May 16	2016	410	643	1053
Monday April 15	2019	407	547	954

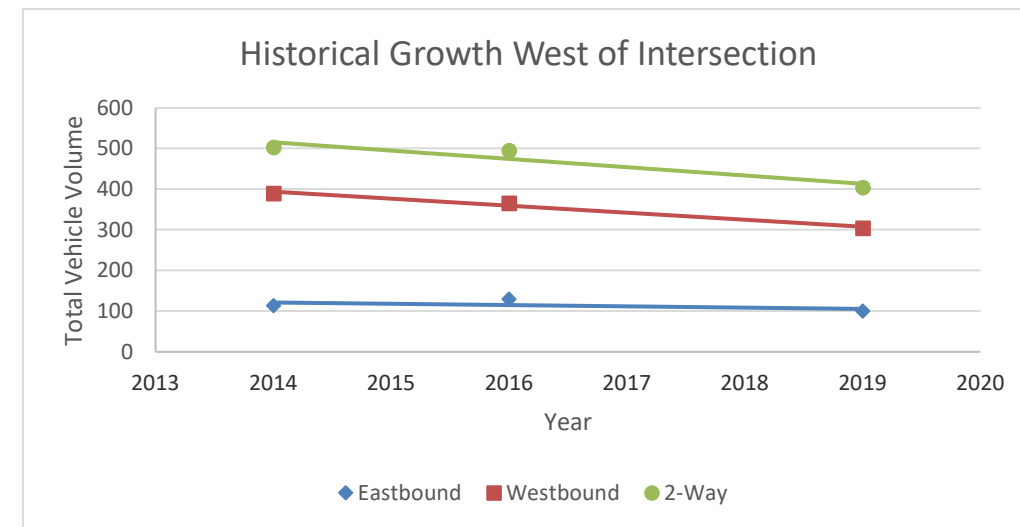
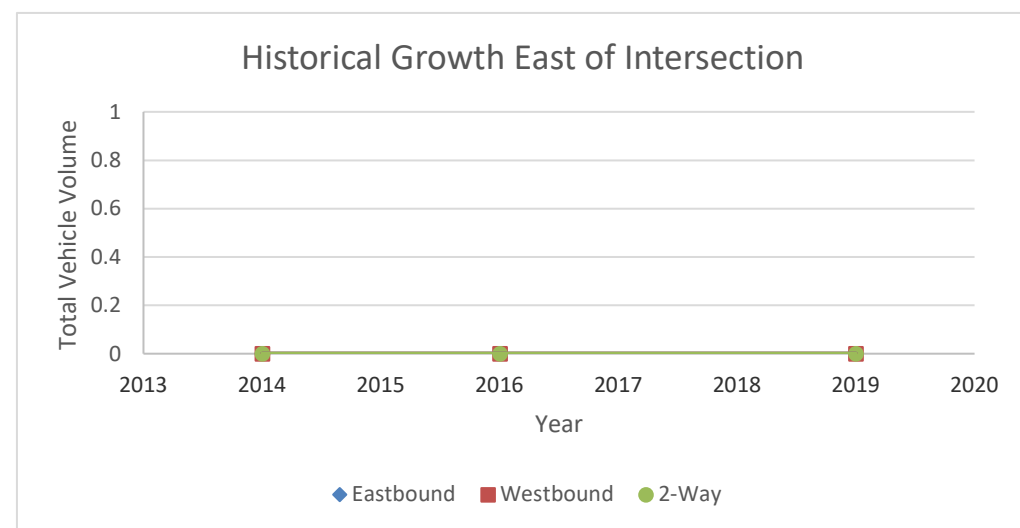
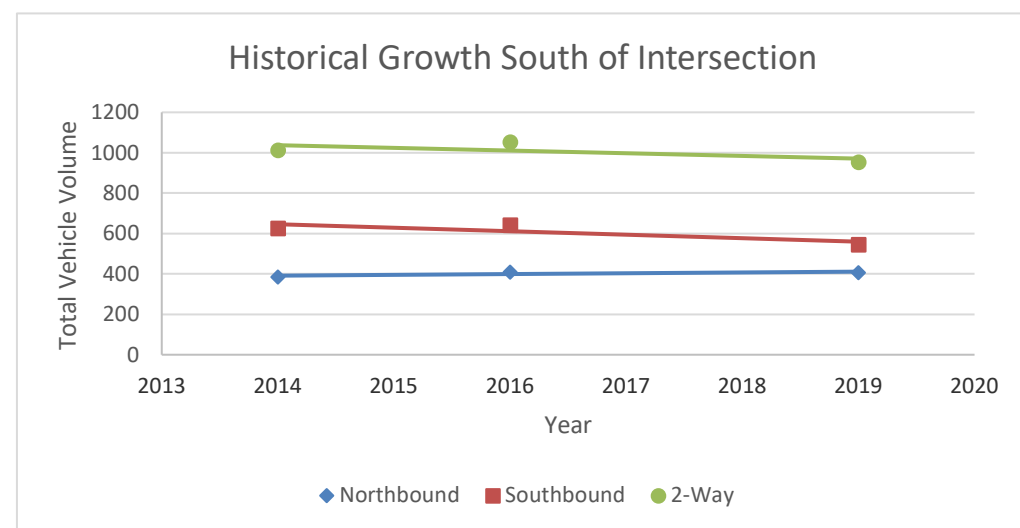
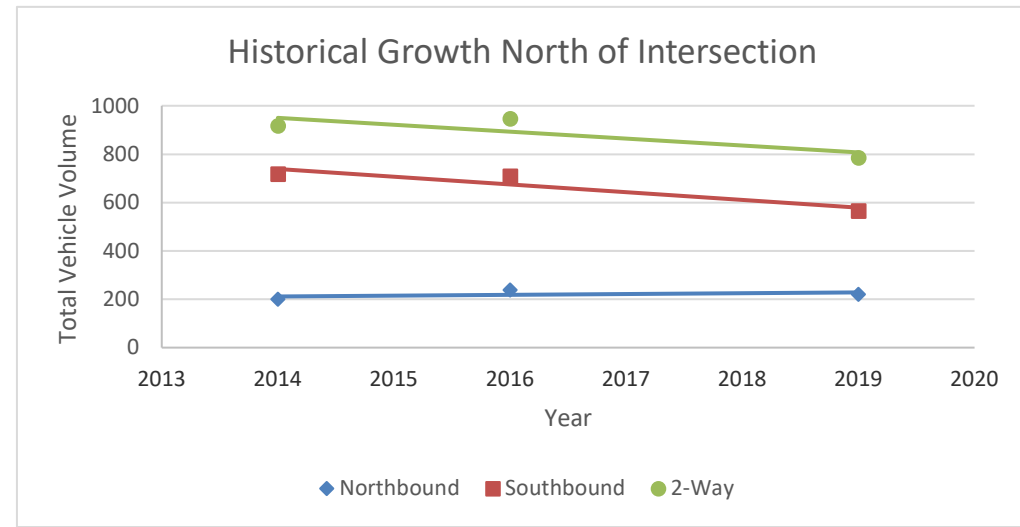
Trend Point at start		391.4	645.9	1037.3
Trend Point at end		411.3	559.6	970.9
Slope		4.0	-17.3	-13.3
Annual Growth		1.0%	-2.8%	-1.3%

East of Intersection				
Date	Year	Eastbound	Westbound	2-Way
Wednesday October 15	2014	0	0	0
Monday May 16	2016	0	0	0
Monday April 15	2019	0	0	0

Trend Point at start		0.0	0.0	0.0
Trend Point at end		0.0	0.0	0.0
Slope		0.0	0.0	0.0
Annual Growth		#DIV/0!	#DIV/0!	#DIV/0!

West of Intersection				
Date	Year	Eastbound	Westbound	2-Way
Wednesday October 15	2014	113	390	503
Monday May 16	2016	129	366	495
Monday April 15	2019	100	305	405

Trend Point at start		121.4	393.9	515.3
Trend Point at end		105.6	307.6	413.2
Slope		-3.2	-17.3	-20.4
Annual Growth		-2.7%	-4.8%	-4.3%



Project: 50 Speers Road, Oakville
Project ID: 8013-02
Intersection: Kerr St. / Wycroft Road
Peak Hour: PM Peak

North of Intersection				
Date	Year	Northbound	Southbound	2-Way
Wednesday October 15	2014	744	612	1356
Monday May 16	2016	826	589	1415
Monday April 15	2019	699	644	1343

Trend Point at start		783.5	597.9	1381.3
Trend Point at end		725.3	634.6	1359.9
Slope		-11.6	7.3	-4.3
Annual Growth		-1.5%	1.2%	-0.3%

South of Intersection				
Date	Year	Northbound	Southbound	2-Way
Wednesday October 15	2014	875	697	1572
Monday May 16	2016	1015	747	1762
Monday April 15	2019	837	684	1521

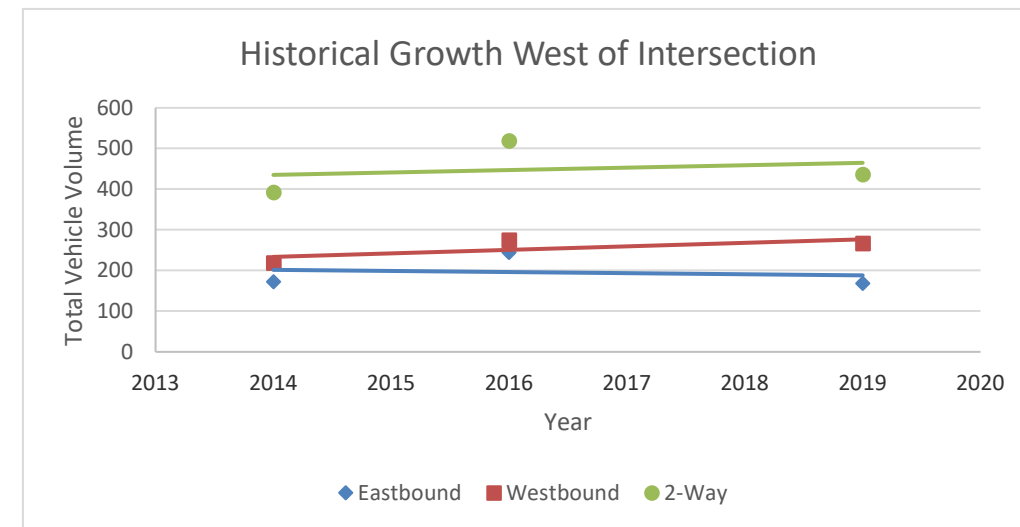
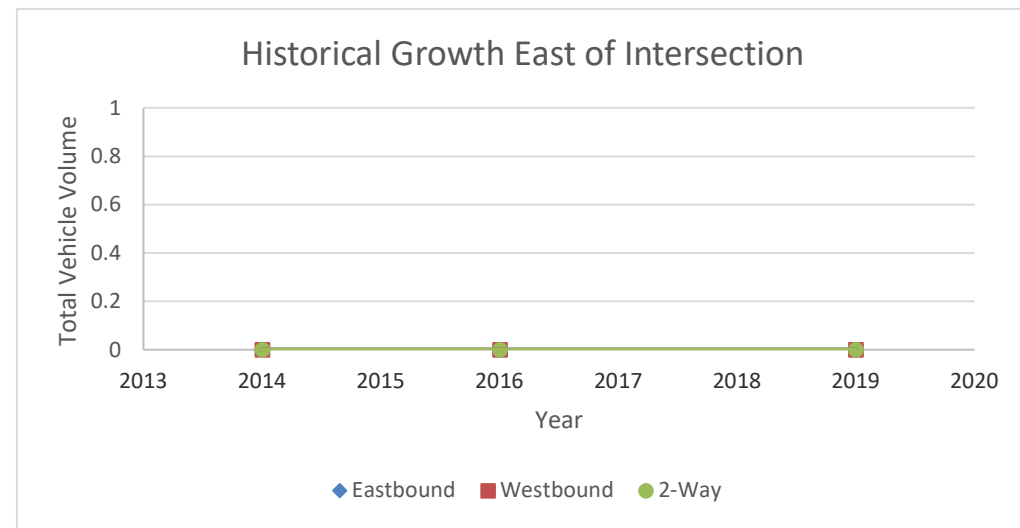
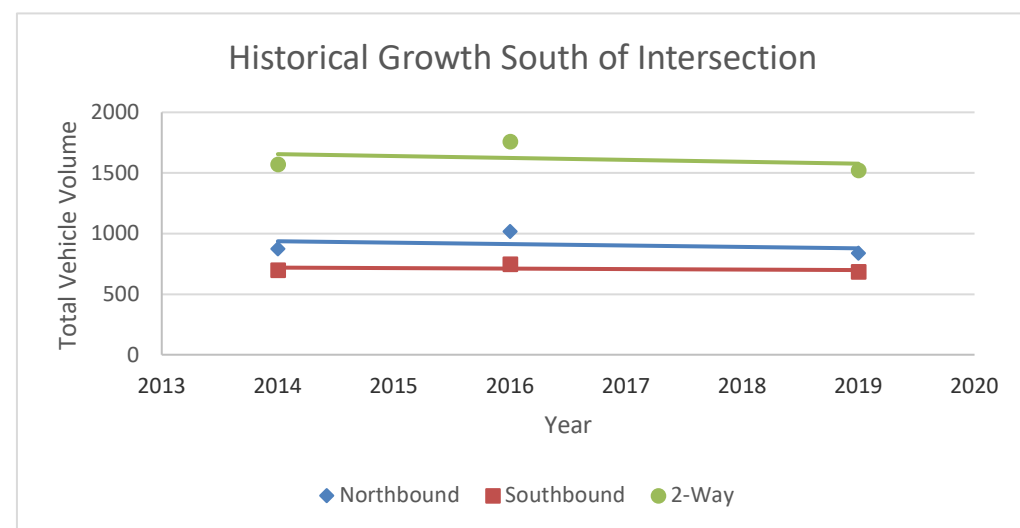
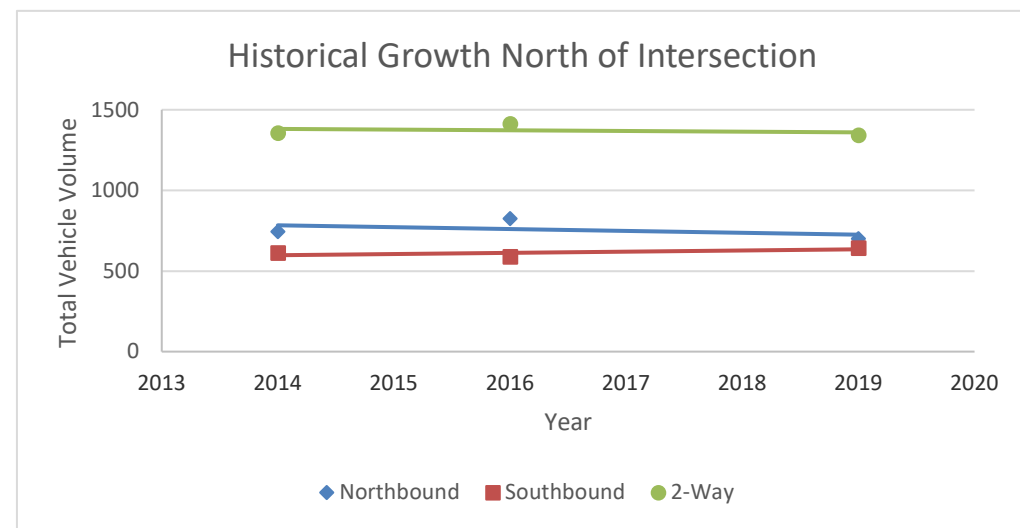
Trend Point at start		936.3	718.8	1655.1
Trend Point at end		877.8	698.5	1576.4
Slope		-11.7	-4.1	-15.7
Annual Growth		-1.3%	-0.6%	-1.0%

East of Intersection				
Date	Year	Eastbound	Westbound	2-Way
Wednesday October 15	2014	0	0	0
Monday May 16	2016	0	0	0
Monday April 15	2019	0	0	0

Trend Point at start		0.0	0.0	0.0
Trend Point at end		0.0	0.0	0.0
Slope		0.0	0.0	0.0
Annual Growth		#DIV/0!	#DIV/0!	#DIV/0!

West of Intersection				
Date	Year	Eastbound	Westbound	2-Way
Wednesday October 15	2014	173	219	392
Monday May 16	2016	244	275	519
Monday April 15	2019	169	267	436

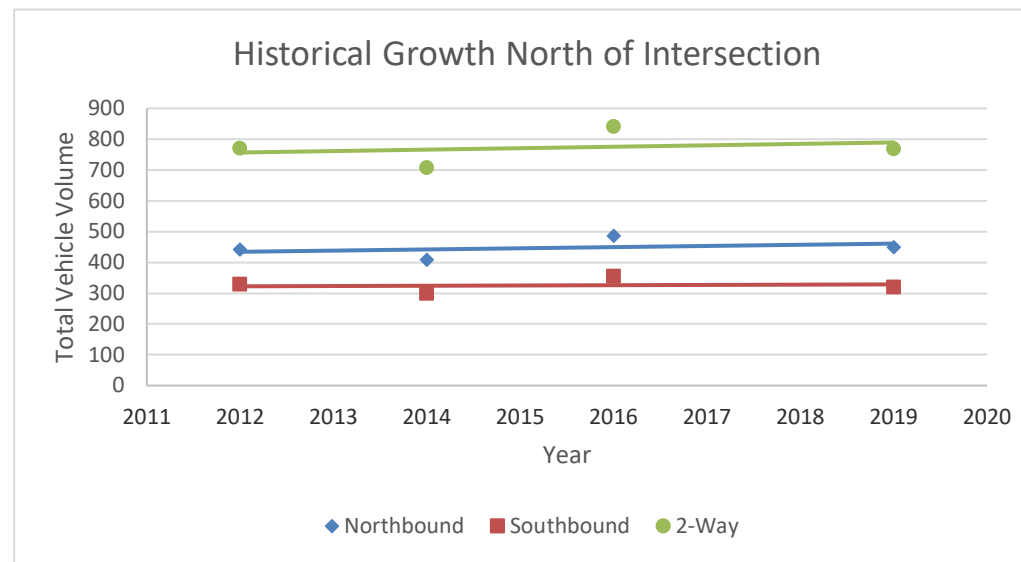
Trend Point at start		201.7	233.5	435.2
Trend Point at end		188.1	276.7	464.8
Slope		-2.7	8.6	5.9
Annual Growth		-1.4%	3.4%	1.3%



Project: 50 Speers Road, Oakville
Project ID: 8013-02
Intersection: Kerr St. / Stewart St.
Peak Hour: AM Peak

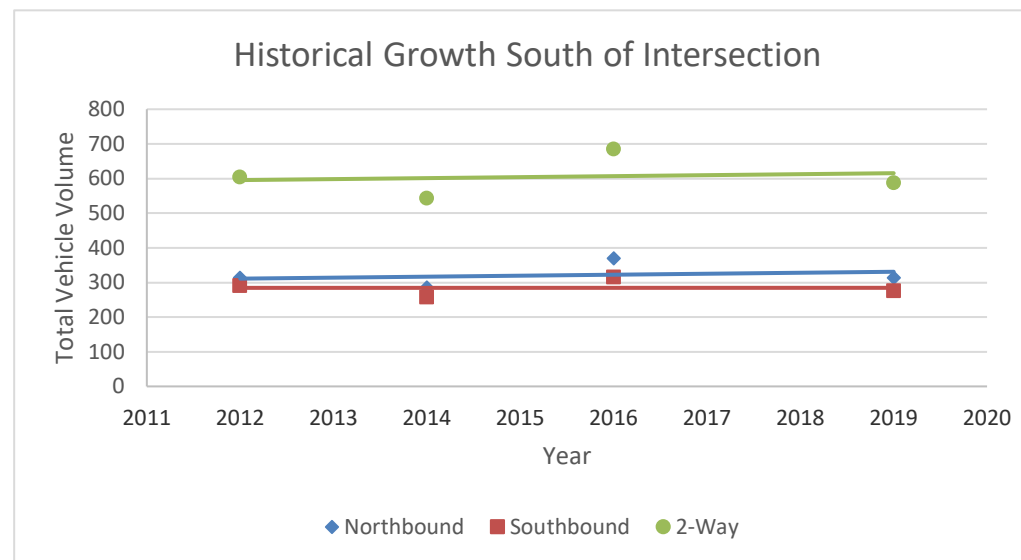
North of Intersection				
Date	Year	Northbound	Southbound	2-Way
Wednesday September 12	2012	442	329	771
Tuesday October 14	2014	409	298	707
Thursday October 27	2016	487	354	841
Wednesday May 8	2019	449	320	769

Trend Point at start		434.4	322.4	756.8
Trend Point at end		460.9	328.6	789.5
Slope		3.8	0.9	4.7
Annual Growth		0.8%	0.3%	0.6%



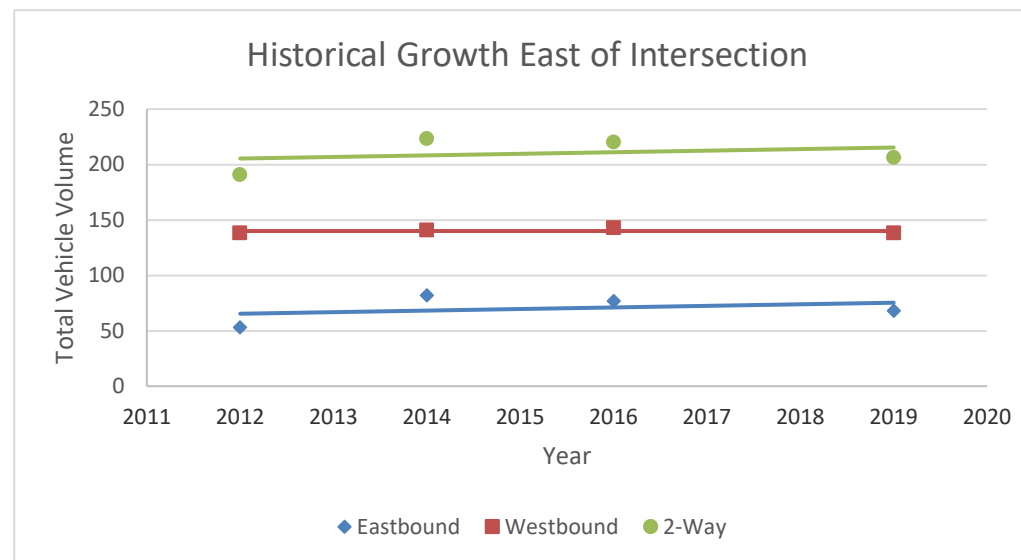
South of Intersection				
Date	Year	Northbound	Southbound	2-Way
Wednesday September 12	2012	313	291	604
Tuesday October 14	2014	286	257	543
Thursday October 27	2016	369	315	684
Wednesday May 8	2019	313	275	588

Trend Point at start		311.0	284.4	595.5
Trend Point at end		330.9	284.6	615.4
Slope		2.8	0.0	2.9
Annual Growth		0.9%	0.0%	0.5%



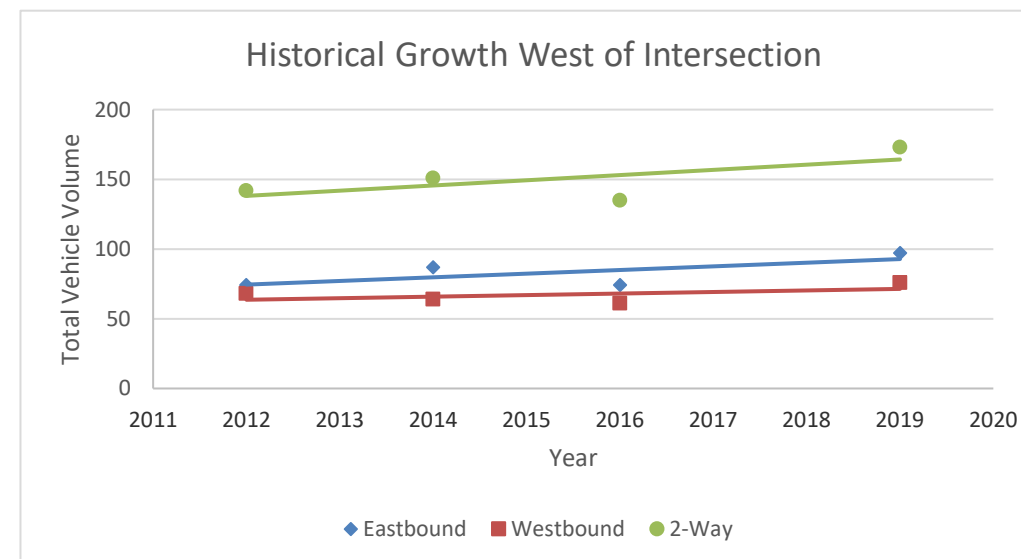
East of Intersection				
Date	Year	Eastbound	Westbound	2-Way
Wednesday September 12	2012	53	138	191
Tuesday October 14	2014	82	141	223
Thursday October 27	2016	77	143	220
Wednesday May 8	2019	68	138	206

Trend Point at start		65.4	140.0	205.4
Trend Point at end		75.3	140.0	215.3
Slope		1.4	0.0	1.4
Annual Growth		2.0%	0.0%	0.7%



West of Intersection				
Date	Year	Eastbound	Westbound	2-Way
Wednesday September 12	2012	74	68	142
Tuesday October 14	2014	87	64	151
Thursday October 27	2016	74	61	135
Wednesday May 8	2019	97	76	173

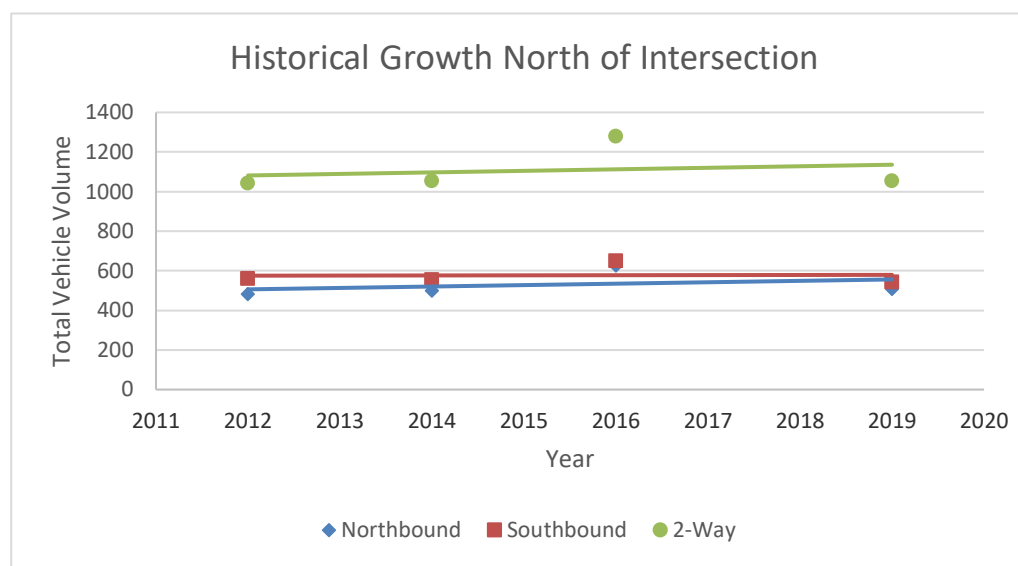
Trend Point at start		74.5	63.6	138.1
Trend Point at end		92.8	71.4	164.2
Slope		2.6	1.1	3.7
Annual Growth		3.2%	1.7%	2.5%



Project: 50 Speers Road, Oakville
Project ID: 8013-02
Intersection: Kerr St. / Stewart St.
Peak Hour: PM Peak

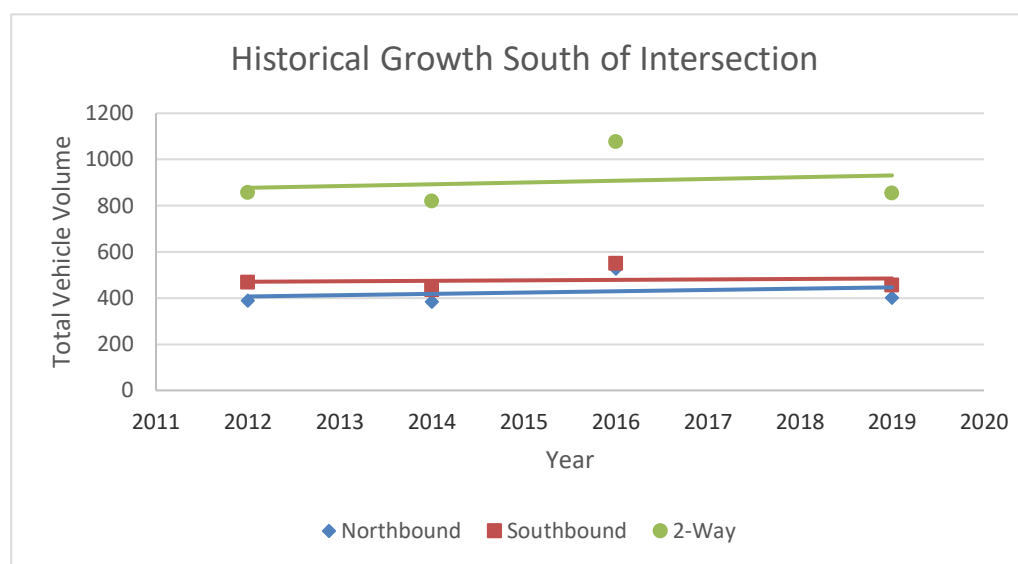
North of Intersection				
Date	Year	Northbound	Southbound	2-Way
Wednesday September 12	2012	481	560	1041
Tuesday October 14	2014	500	554	1054
Thursday October 27	2016	628	651	1279
Wednesday May 8	2019	509	544	1053

Trend Point at start		506.2	575.3	1081.6
Trend Point at end		556.3	579.5	1135.8
Slope		7.2	0.6	7.7
Annual Growth		1.4%	0.1%	0.7%



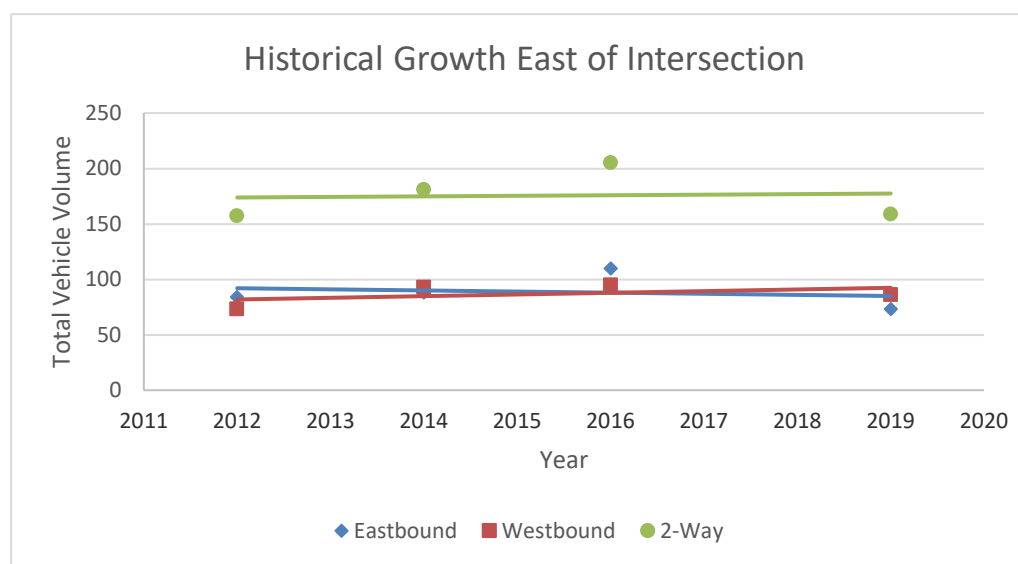
South of Intersection				
Date	Year	Northbound	Southbound	2-Way
Wednesday September 12	2012	389	468	857
Tuesday October 14	2014	384	435	819
Thursday October 27	2016	527	550	1077
Wednesday May 8	2019	400	455	855

Trend Point at start		406.7	470.4	877.1
Trend Point at end		446.2	484.6	930.7
Slope		5.6	2.0	7.7
Annual Growth		1.3%	0.4%	0.9%



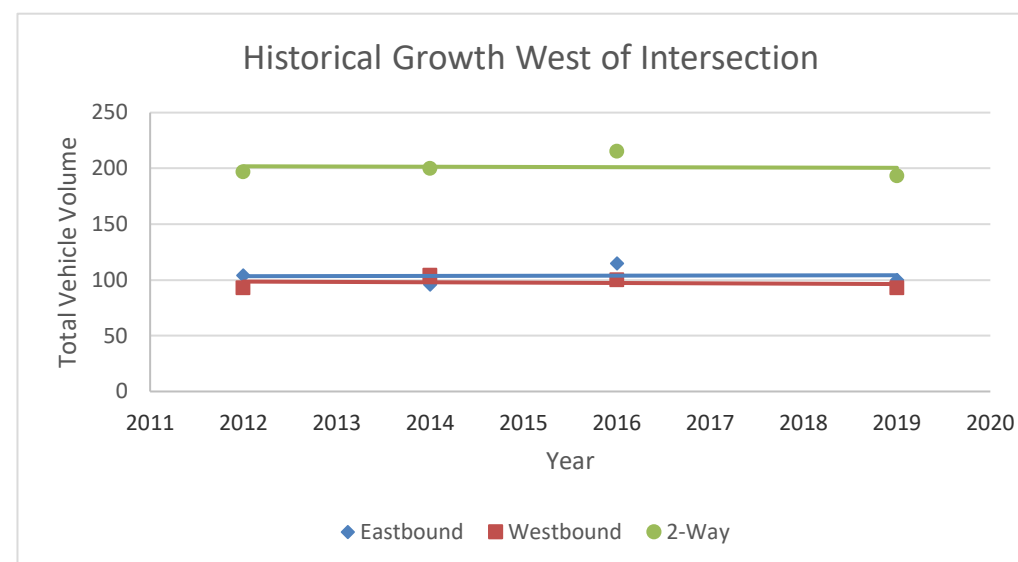
East of Intersection				
Date	Year	Eastbound	Westbound	2-Way
Wednesday September 12	2012	84	73	157
Tuesday October 14	2014	88	93	181
Thursday October 27	2016	110	95	205
Wednesday May 8	2019	73	86	159

Trend Point at start		92.0	81.9	173.9
Trend Point at end		85.0	92.4	177.4
Slope		-1.0	1.5	0.5
Annual Growth		-1.1%	1.7%	0.3%



West of Intersection				
Date	Year	Eastbound	Westbound	2-Way
Wednesday September 12	2012	104	93	197
Tuesday October 14	2014	96	104	200
Thursday October 27	2016	115	100	215
Wednesday May 8	2019	100	93	193

Trend Point at start		103.4	98.5	201.9
Trend Point at end		104.2	96.3	200.5
Slope		0.1	-0.3	-0.2
Annual Growth		0.1%	-0.3%	-0.1%



Appendix F

TTS Data Queries



50 Speers Road

8013-02

Residential Vehicular Site Traffic Distribution (AM Peak Hour)

Outbound

BA Group - SUK

9/1/2022

Tue Feb 22 2022 16:14:40 GMT-0500 (Eastern Standard Time) - Run Time: 2884ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: Planning district of destination - pd_dest

Column: 2006 GTA zone of origin - gta06_orig

Filters:

Start time of trip - start_time In 600-859

and

Primary travel mode c M P T U

and

Trip purpose of origin

and

2006 GTA zone of ori 4011 4012 4013

Trip 2016

Table:

	4011	4012	4013	Total
PD 1 of Toronto	18	60	0	78
PD 2 of Toronto	11	0	0	11
PD 3 of Toronto	0	34	4	38
PD 5 of Toronto	17	0	0	17
PD 6 of Toronto	29	0	0	29
PD 8 of Toronto	0	0	17	17
PD 9 of Toronto	16	0	0	16
PD 10 of Toronto	0	0	34	34
Brampton	42	0	0	42
Mississauga	400	144	125	669
Milton	34	11	21	66
Oakville	469	1023	116	1608
Burlington	77	68	0	145
Flamborough	0	52	0	52
Hamilton	180	58	6	244
St. Catharines	15	0	40	55
Cambridge	99	0	0	99
City of Guelph	0	4	0	4

Tue Feb 22 2022 16:26:08 GMT-0500 (Eastern Standard Time) - Run Time: 2884ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06_dest

Column: 2006 GTA zone of origin - gta06_orig

Filters:

Start time of trip - start_time In 600-859

and

Primary travel mode c M P T U

and

Trip purpose of origin

and

2006 GTA zone of ori 4011 4012 4013

and

Planning district of destination - pd_dest In 39

Trip 2016

Table:

	4011	4012	4013	Total
4001	0	22	0	22
4003	0	13	0	13
4005	0	0	21	21
4006	0	24	0	24
4008	25	61	0	86
4009	72	17	0	89
4011	47	272	0	319
4012	0	140	0	140
4014	33	25	0	58
4016	39	0	0	39
4017	89	0	0	89
4022	0	73	0	73
4024	0	48	18	66
4025	0	8	0	8
4027	29	0	0	29
4029	44	103	0	147
4030	9	64	0	73
4034	0	36	0	36
4040	58	21	0	79
4041	0	80	34	114
4042	0	0	6	6
4182	0	14	0	14
4184	23	0	0	23
4185	0	0	37	37
				1605

50 Speers Road

8013-02

Residential Vehicular Site Traffic Distribution (PM Peak Hour)

Inbound

BA Group - SUK

9/1/2022

Tue Feb 22 2022 16:41:17 GMT-0500 (Eastern Standard Time) - Run Time: 2610ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: Planning district of origin - pd_orig

Column: 2006 GTA zone of destination - gta06_dest

Filters:

Start time of trip - start_time In 1500-1759

and

Primary travel mode c M P T U

and

Trip purpose of destir

and

2006 GTA zone of de 4011 4012 4013

Trip 2016

Table:

	4011	4012	4013	Total
PD 1 of Toronto	0	54	0	54
PD 5 of Toronto	17	0	0	17
PD 9 of Toronto	16	0	0	16
PD 12 of Toronto	0	25	0	25
Aurora	22	0	0	22
Vaughan	15	0	0	15
Brampton	26	0	0	26
Mississauga	120	220	157	497
Halton Hills	0	36	0	36
Milton	7	15	0	22
Oakville	844	970	108	1922
Burlington	64	77	17	158
Flamborough	0	52	0	52
Hamilton	0	0	6	6
St. Catharines	0	0	40	40
Cambridge	99	0	0	99
City of Guelph	0	4	0	4
Tiny	0	21	0	21

Tue Feb 22 2022 16:43:56 GMT-0500 (Eastern Standard Time) - Run Time: 2610ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig

Column: 2006 GTA zone of destination - gta06_dest

Filters:

Start time of trip - start_time In 1500-1759

and

Primary travel mode c M P T U

and

Trip purpose of destin

and

2006 GTA zone of de: 4011 4012 4013

Planning district of ori

Trip 2016

Table:

	4011	4012	4013	Total
4001	0	22	0	22
4005	67	15	21	103
4006	0	24	0	24
4008	25	97	0	122
4009	110	14	16	140
4010	89	4	0	93
4011	93	192	8	293
4012	63	116	0	179
4014	41	161	0	202
4016	76	0	4	80
4017	33	0	0	33
4018	0	0	19	19
4019	4	0	0	4
4023	0	0	4	4
4024	0	48	4	52
4027	29	0	0	29
4029	44	141	0	185
4030	44	85	0	129
4037	49	0	0	49
4039	0	10	0	10
4040	76	13	25	114
4042	0	0	6	6
4182	0	14	0	14
4183	0	11	0	11
				1917

AM		RESIDENTIAL VEHICLE TRIP DISTRIBUTION											
OUTBOUND		Traffic Volume Allocation											
9/1/2022													
Zone	Trips	%	EAST	WEST	NORTH	SOUTH	NORTH	SOUTH	EAST	WEST	WEST	SOUTH	TOTAL
			Hwy 403	Hwy 403	Kerr Street	Kerr Street	Donval Drive	Donval Drive	Speers Road	Speers Road	Wycroft Road	Queen Mary Drive	
PD 1 of Toronto	78	3%	100%										100.00%
PD 2 of Toronto	11	0%	100%										100.00%
PD 3 of Toronto	38	1%	100%										100.00%
PD 5 of Toronto	17	1%	100%										100.00%
PD 6 of Toronto	29	1%	100%										100.00%
PD 8 of Toronto	17	1%	100%										100.00%
PD 9 of Toronto	16	1%	100%										100.00%
PD 10 of Toronto	34	1%	100%										100.00%
Brampton	42	1%	100%										100.00%
Mississauga	669	22%	100%										100.00%
Milton	66	2%		50%	50%								100.00%
4001	22	1%		30%				40%		30%			100.00%
4003	13	0%		35%					35%	30%			100.00%
4005	21	1%				20%			70%	10%			100.00%
4006	24	1%				50%			50%				100.00%
4008	86	3%							50%	50%			100.00%
4009	89	3%							50%	50%			100.00%
4011	319	10%				25%						25%	100.00%
4012			DOES NOT APPLY										
4014	58	2%							100%				100.00%
4016	39	1%				50%			50%				100.00%
4017	89	3%				40%			60%				100.00%
4022	73	2%	100%										100.00%
4024	66	2%	100%										100.00%
4025	8	0%	35%					30%	35%				100.00%
4027	29	1%	50%						50%				100.00%
4029	147	5%	40%					20%	40%				100.00%
4030	73	2%	40%					20%	40%				100.00%
4034	36	1%	25%					25%	50%				100.00%
4040	79	3%								20%			100.00%
4041	114	4%		50%	50%								100.00%
4042	6	0%		50%					50%				100.00%
4182	14	0%			50%				50%				100.00%
4184	23	1%		60%					40%				100.00%
4185	37	1%		30%	40%				30%				100.00%
Burlington	145	5%		80%					20%				100.00%
Flamborough	52	2%		100%									100.00%
Hamilton	244	8%		100%									100.00%
St. Catharines	55	2%		100%									100.00%
Cambridge	99	3%	10%	90%									100.00%
City of Guelph	4	0%	10%	90%									100.00%
	3081	100%											

Route Split Totals										
EAST	WEST	NORTH	SOUTH	NORTH	SOUTH	EAST	WEST	WEST	SOUTH	TOTAL
Hwy 403	Hwy 403	Kerr Street	Kerr Street	Donval Drive	Donval Drive	Speers Road	Speers Road	Wycroft Road	Queen Mary Drive	
2.53%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.5%
0.36%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.4%
1.23%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.2%
0.55%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.6%
0.94%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.9%
0.55%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.6%
0.52%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.5%
1.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.1%
1.36%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.4%
21.71%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	21.7%
0.00%	1.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.1%
0.00%	0.21%	0.00%	0.00%	0.00%	0.29%	0.00%	0.21%	0.00%	0.00%	0.7%
0.00%	0.15%	0.00%	0.00%	0.00%	0.00%	0.00%	0.15%	0.13%	0.00%	0.4%
0.00%	0.00%	0.00%	0.14%	0.00%	0.48%	0.00%	0.07%	0.00%	0.00%	0.7%
0.00%	0.00%	0.00%	0.39%	0.00%	0.39%	0.00%	0.00%	0.00%	0.00%	0.8%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.40%	1.40%	0.00%	2.8%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.44%	1.44%	0.00%	2.9%
0.00%	0.00%	0.00%	2.59%	0.00%	5.18%	0.00%	0.00%	0.00%	2.59%	10.4%
DOES NOT APPLY										
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.88%	0.00%	0.00%	0.00%	1.9%
0.00%	0.00%	0.00%	0.63%	0.00%	0.63%	0.00%	0.00%	0.00%	0.00%	1.3%
0.00%	0.00%	0.00%	1.16%	0.00%	0.00%	1.73%	0.00%	0.00%	0.00%	2.9%
2.37%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.4%
2.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.1%
0.09%	0.00%	0.00%	0.00%	0.08%	0.00%	0.09%	0.00%	0.00%	0.00%	0.3%
0.47%	0.00%	0.00%	0.00%	0.00%	0.00%	0.47%	0.00%	0.00%	0.00%	0.9%
1.91%	0.00%	0.00%	0.00%	0.95%	0.00%	1.91%	0.00%	0.00%	0.00%	4.8%
0.95%	0.00%	0.00%	0.00%	0.47%	0.00%	0.95%	0.00%	0.00%	0.00%	2.4%
0.29%	0.00%	0.00%	0.00%	0.29%	0.00%	0.58%	0.00%	0.00%	0.00%	1.2%
0.00%	0.00%	0.77%	0.00%	1.28%	0.00%	0.00%	0.00%	0.51%	0.00%	2.6%
0.00%	1.85%	1.85%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.7%
0.00%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.10%	0.00%	0.2%
0.00%	0.00%	0.23%	0.00%	0.00%	0.00%	0.23%	0.00%	0.00%	0.00%	0.5%
0.00%	0.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.30%	0.00%	0.7%
0.00%	0.36%	0.48%	0.00%	0.00%	0.00%	0.00%	0.00%	0.36%	0.00%	1.2%
0.00%	3.77%	0.00%	0.00%	0.00%	0.00%	0.00%	0.94%	0.00%	0.00%	4.7%
0.00%	1.69%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.7%
0.00%	7.92%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.9%
0.00%	1.79%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.8%
0.32%	2.89%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.2%
0.01%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.1%
39.4%	22.4%	4.4%	4.9%	3.1%	6.3%	8.5%	4.2%	4.2%	2.6%	100.0%

Rounded

CARDINAL DIRECTION	%
NORTH	8.00%
SOUTH	14.00%
EAST	48.00%
WEST	30.00%



AM	RESIDENTIAL VEHICLE TRIP DISTRIBUTION																					
OUTBOUND	Traffic Volume Allocation											Route Split Totals										
9/1/2022																						

Zone	Trips	%	EAST		WEST		NORTH		SOUTH		EAST		WEST		WEST		SOUTH		TOTAL
			Hwy 403	Hwy 403	Kerr Street	Kerr Street	Dorval Drive	Dorval Drive	Speers Road	Speers Road	Wycroft Road	Queen Mary Drive							
PD 1 of Toronto	54	2%	100%															100.00%	
PD 5 of Toronto	17	1%	100%															100.00%	
PD 9 of Toronto	16	1%	100%															100.00%	
PD 12 of Toronto	25	1%	100%															100.00%	
Aurora	22	1%	100%															100.00%	
Vaughan	15	1%	100%															100.00%	
Brampton	26	1%	100%															100.00%	
Mississauga	497	17%	100%															100.00%	
Halton Hills	36	1%	10%	45%							45%							100.00%	
Milton	22	1%	10%	45%	45%													100.00%	
4001	22	1%		50%							50%							100.00%	
4005	103	4%									50%							100.00%	
4006	24	1%									30%							100.00%	
4008	122	4%									50%	50%						100.00%	
4009	140	5%									50%	50%						100.00%	
4010	93	3%									50%							100.00%	
4011	293	10%									30%						30%	100.00%	
4012			DOES NOT APPLY.																
4014	202	7%									100%							100.00%	
4016	80	3%									50%							100.00%	
4017	33	1%									60%							100.00%	
4018	19	1%									40%							100.00%	
4019	4	0%									100%							100.00%	
4023	4	0%									40%							100.00%	
4024	52	2%	100%															100.00%	
4027	29	1%	50%								50%							100.00%	
4029	185	6%	40%								40%	20%						100.00%	
4030	129	5%	50%								50%							100.00%	
4037	49	2%	50%								50%							100.00%	
4039	10	0%		30%									30%					100.00%	
4040	114	4%																100.00%	
4042	6	0%		60%										40%				100.00%	
4182	14	0%									50%							100.00%	
4183	11	0%									50%							100.00%	
Burlington	158	6%		50%							50%							100.00%	
Flamborough	52	2%		100%														100.00%	
Hamilton	6	0%		100%														100.00%	
St. Catharines	40	1%		100%														100.00%	
Cambridge	99	3%	10%	90%														100.00%	
City of Guelph	4	0%	10%	45%							45%							100.00%	
Tiny	21	1%	100%															100.00%	
	2848	100%																	

EAST	WEST	NORTH	SOUTH	NORTH	SOUTH	EAST	WEST	WEST	SOUTH	TOTAL
1.90%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.9%
0.60%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.6%
0.56%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.6%
0.88%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.9%
0.77%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.8%
0.53%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.5%
0.91%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.9%
17.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	17.5%
0.13%	0.57%	0.00%	0.00%	0.00%	0.00%	0.57%	0.00%	0.00%	0.00%	1.3%
0.08%	0.35%	0.35%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.8%
0.00%	0.39%	0.00%	0.00%	0.00%	0.39%	0.00%	0.00%	0.00%	0.00%	0.8%
0.00%	0.00%	0.00%	0.00%	0.00%	1.81%	0.00%	1.81%	0.00%	0.00%	3.6%
0.00%	0.00%	0.00%	0.25%	0.00%	0.34%	0.00%	0.25%	0.00%	0.00%	0.8%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.14%	2.14%	0.00%	4.3%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.46%	2.46%	0.00%	4.9%
0.00%	0.00%	0.00%	1.63%	0.00%	0.00%	0.00%	1.63%	0.00%	0.00%	3.3%
0.00%	0.00%	0.00%	2.06%	2.06%	0.00%	0.00%	3.09%	0.00%	3.09%	10.3%
DOES NOT APPLY.										
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.09%	0.00%	0.00%	0.00%	7.1%
0.00%	0.00%	0.00%	1.40%	0.00%	0.00%	1.40%	0.00%	0.00%	0.00%	2.8%
0.00%	0.00%	0.00%	0.46%	0.00%	0.00%	0.70%	0.00%	0.00%	0.00%	1.2%
0.00%	0.00%	0.00%	0.27%	0.00%	0.00%	0.40%	0.00%	0.00%	0.00%	0.7%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%	0.1%
0.00%	0.00%	0.06%	0.03%	0.00%	0.00%	0.06%	0.00%	0.00%	0.00%	0.1%
1.83%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.8%
0.51%	0.00%	0.00%	0.00%	0.00%	0.00%	0.51%	0.00%	0.00%	0.00%	1.0%
2.60%	0.00%	0.00%	0.00%	0.00%	0.00%	2.60%	1.30%	0.00%	0.00%	6.5%
2.26%	0.00%	0.00%	0.00%	0.00%	0.00%	2.26%	0.00%	0.00%	0.00%	4.5%
0.86%	0.00%	0.00%	0.00%	0.00%	0.00%	0.86%	0.00%	0.00%	0.00%	1.7%
0.00%	0.11%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%	0.11%	0.00%	0.4%
0.00%	0.00%	2.00%	0.00%	2.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.0%
0.00%	0.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.08%	0.00%	0.2%
0.00%	0.00%	0.25%	0.00%	0.00%	0.00%	0.25%	0.00%	0.00%	0.00%	0.5%
0.00%	0.00%	0.19%	0.00%	0.00%	0.00%	0.19%	0.00%	0.00%	0.00%	0.4%
0.00%	2.77%	0.00%	0.00%	2.77%	0.00%	0.00%	0.00%	0.00%	0.00%	5.5%
0.00%	1.83%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.8%
0.00%	0.21%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.2%
0.00%	1.40%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.4%
0.35%	3.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.5%
0.01%	0.06%	0.00%	0.00%	0.00%	0.00%	0.06%	0.00%	0.00%	0.00%	0.1%
0.74%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.7%
33.0%	10.9%	2.8%	6.1%	7.0%	2.5%	17.1%	12.7%	4.8%	3.1%	100.0%

Rounded

33.00%	11.00%	3.00%	6.00%	7.00%	2.00%	17.00%	13.00%	5.00%	3.00%	100%
---------------	---------------	--------------	--------------	--------------	--------------	---------------	---------------	--------------	--------------	-------------

CARDINAL DIRECTION	
NORTH	10.00%
SOUTH	11.00%
EAST	50.00%
WEST	29.00%

50 Speers Road

8013-02

Mode Split

Outbound - Inbound

BA Group - SUK

9/1/2022

2016 TTS DATA

Tue Feb 22 2022 18:40:53 GMT-0500 (Eastern Standard Time)

Tue Feb 22 2022 18:42:04 GMT-0500 (Eastern Stand:

Frequency Distribution Query Form - Trip - 2016 v1.1

Frequency Distribution Query Form - Trip - 2016 v1.1

Field: Primary travel mode of trip - mode_prime

Field: Primary travel mode of trip - mode_prime

Filters:

Start time of trip - start_time In 600-859

and

Trip purpose of origin - purp_orig In H

and

2006 GTA zone of or 4011 4012 4013

Filters:

Start time of trip - start_time In 1500-1759

and

Trip purpose of destination - purp_dest In H

and

2006 GTA zone of (4011 4012 4013

Table: Trip 2016

Row:	Count:	Expanded:	
Transit excluding GC	8	203	4%
Cycle	3	45	1%
Auto driver	111	2611	57%
GO rail only	14	234	5%
Joint GO rail and loc	10	158	3%
Motorcycle	1	6	0%
Auto passenger	22	582	13%
School bus	12	387	8%
Paid rideshare	1	26	1%
Walk	15	316	7%
Total:	197	4568	100%

Table: Trip 2016

Row:	Count:	Expanded:	
Transit excluding G	8	186	4%
Cycle	4	71	2%
Auto driver	127	2677	64%
GO rail only	12	216	5%
Joint GO rail and lo	5	88	2%
Motorcycle	1	14	0%
Auto passenger	17	340	8%
School bus	8	241	6%
Walk	17	358	9%
Total:	199	4192	100%

Driver	57%
Passenger	13%
Transit	21%
Walk	7%
Cycle	1%
Total	100%

Driver	64%
Passenger	8%
Transit	17%
Walk	9%
Cycle	2%
Total	100%

Appendix G

Existing Traffic Signal Timings



Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK1010 - Kerr St @ Shepherd Rd - Econolite Type - Cobalt

Controller Timing Plan (MM) 2-1

Plan 1 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	S-L	N-T	N	W-T	N	S-T	N	N	N	N	N	N	N	N	N	N
Min Green	7	18	0	10	0	18	0	0	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	13	0	16	0	13	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	2.5	3.5	5.0	3.0	5.0	3.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	10	35	0	22	0	35	0	0	35	35	35	35	35	35	35	35
Max2	10	50	0	22	0	50	0	0	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	4.0	3.3	3.0	3.3	3.0	3.3	3.0	3.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	0.0	1.9	1.0	2.1	1.0	1.9	1.0	2.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK1010 - Kerr St @ Shepherd Rd - Econolite Type - Cobalt

Coordination Options**Options (MM) 3-1**

Manual Pattern	Auto	ECPI Coord	Yes
System Source	SYS	System Format	STD
Splits In	Percent	Offsets In	Percent
Transition	Smooth	Max Select	MAXINH
Dwell / Add Time	0		
Delay Coord Wk-LZ	No	Force Off	Float
Offset Reference	Lead	Use Ped Time	Yes
Ped Recall	No	Ped Reservice	No
Local Zero Override	No	FO Added Ini Green	No
Re-sync Count	3	Multisync	No

Auto Perm Minimum Green (Seconds) (MM) 3-4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Split Demand (MM) 3-5

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Demand 1																
Demand 2																

Demand	1	2
Detector	0	0
Call Time (Sec)	0	0
Cycle Count	0	0

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK1010 - Kerr St @ Shepherd Rd - Econolite Type - Cobalt

Coordination Pattern Data
Coordinator Pattern Data (MM) 3-2

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK1010 - Kerr St @ Shepherd Rd - Econolite Type - Cobalt

Coordination Split Pattern
Split Pattern Data (MM) 3-3

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK1010 - Kerr St @ Shepherd Rd - Econolite Type - Cobalt

Time Base Day Plan/Schedule
Day Plan (MM) 5-3

Schedule (MM) 5-4

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK1009 - Speers Rd @ Kerr St - Econolite Type - ASC/3

Controller Timing Plan (MM) 2-1

Plan 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	EBLT	WB	SBLT	NB	WBLT	EB	NBLT	SB								
Min Green	7	25	7	10	7	25	7	10	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	7	0	14	0	7	0	14	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	14	0	25	0	14	0	25	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	2.5	5.5	2.5	4.0	2.5	5.5	2.5	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	20	40	25	40	20	40	20	40	35	35	35	35	35	35	35	35
Max2	20	55	35	45	30	55	30	45	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.7	3.0	3.3	3.0	3.7	3.0	3.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	0.0	2.2	0.0	3.0	0.0	2.2	0.0	3.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK1009 - Speers Rd @ Kerr St - Econolite Type - ASC/3

Coordination Options**Options (MM) 3-1**

Manual Pattern	Auto	ECPI Coord	Yes
System Source	HDW	System Format	STD
Splits In	Percent	Offsets In	Percent
Transition	Smooth	Max Select	MAXINH
Dwell / Add Time	0		
Delay Coord Wk-LZ	No	Force Off	Float
Offset Reference	Lead	Use Ped Time	Yes
Ped Recall	No	Ped Reservice	No
Local Zero Override	Yes	FO Added Ini Green	No
Re-sync Count	0	Multisync	No

Auto Perm Minimum Green (Seconds) (MM) 3-4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Split Demand (MM) 3-5

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Demand 1																
Demand 2																

Demand	1	2
Detector	0	0
Call Time (Sec)	0	0
Cycle Count	0	0

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK1009 - Speers Rd @ Kerr St - Econolite Type - ASC/3

Coordination Pattern Data
Coordinator Pattern Data (MM) 3-2

Coordinator Pattern # 1

Split Pattern	1	TS2 (Pat-Off)	0-1	Splits In	Percent
Cycle	120	Std (COS)	9	Offsets In	Percent
Offset Value	36%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	0		
Actuated Walk Rest	Yes	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	MAXINH	Force Off	Float		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	EBLT	WB	SBLT	NB	WBLT	EB	NBLT	SB								
Splits (Split Pat 1)	9	38	20	33	12	35	9	44	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

Misc. Data			
Veh Perm 1	0	Veh Perm 2	0
Split Demand Pat 1	0	Split Demand Pat 2	0
		Veh Perm 2 Disp	0
		Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

Coordinator Pattern # 2

Split Pattern	2	TS2 (Pat-Off)	0-2	Splits In	Percent
Cycle	120	Std (COS)	17	Offsets In	Percent
Offset Value	23%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	0		
Actuated Walk Rest	Yes	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	MAXINH	Force Off	Float		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	EBLT	WB	SBLT	NB	WBLT	EB	NBLT	SB								
Splits (Split Pat 2)	10	45	13	32	10	45	10	35	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

Misc. Data
 Veh Perm 1 0 Veh Perm 2 0 Veh Perm 2 Disp 0
 Split Demand 0 Split Demand 0 Crossing Arterial 0
 Pat 1 Pat 2 Pat

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

Coordinator Pattern # 3

Split Pattern	3	TS2 (Pat-Off)	0-3	Splits In	Percent
Cycle	120	Std (COS)	25	Offsets In	Percent
Offset Value	41%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	0		
Actuated Walk Rest	Yes	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	MAXINH	Force Off	Float		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	EBLT	WB	SBLT	NB	WBLT	EB	NBLT	SB								
Splits (Split Pat 3)	10	45	15	30	15	40	10	35	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

Misc. Data

Veh Perm 1 0 Veh Perm 2 0 Veh Perm 2 Disp 0
 Split Demand Pat 1 0 Split Demand Pat 2 0 Crossing Arterial Pat 0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

Coordinator Pattern # 4

Split Pattern	4	TS2 (Pat-Off)	1-1	Splits In	Percent
Cycle	120	Std (COS)	33	Offsets In	Percent
Offset Value	23%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	0		
Actuated Walk Rest	Yes	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	MAXINH	Force Off	Float		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	EBLT	WB	SBLT	NB	WBLT	EB	NBLT	SB								
Splits (Split Pat 4)	10	45	13	32	10	45	10	35	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

Misc. Data
 Veh Perm 1 0 Veh Perm 2 0 Veh Perm 2 Disp 0
 Split Demand Pat 1 0 Split Demand Pat 2 0 Crossing Arterial Pat 0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK1009 - Speers Rd @ Kerr St - Econolite Type - ASC/3

Coordination Split Pattern
Split Pattern Data (MM) 3-3
Split Pattern # 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	EBLT	WB	SBLT	NB	WBLT	EB	NBLT	SB								
Split (percent)	9	38	20	33	12	35	9	44	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	100%	0%	0%

Split Pattern # 2

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	EBLT	WB	SBLT	NB	WBLT	EB	NBLT	SB								
Split (percent)	10	45	13	32	10	45	10	35	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	100%	0%	0%

Split Pattern # 3

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	EBLT	WB	SBLT	NB	WBLT	EB	NBLT	SB								
Split (percent)	10	45	15	30	15	40	10	35	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																

Pedestrian Recall																	
Recall to Max. Time																	
Omit Phase									X	X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	100%	0%	0%

Split Pattern # 4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	EBLT	WB	SBLT	NB	WBLT	EB	NBLT	SB								
Split (percent)	10	45	13	32	10	45	10	35	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	100%	0%	0%

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK1009 - Speers Rd @ Kerr St - Econolite Type - ASC/3

Time Base Day Plan/Schedule
Day Plan (MM) 5-3**Day Plan #1**

Event	Action Plan	Start Time
1	1	06:00
2	2	10:00
3	3	15:15
4	4	19:00
5	5	22:00

Schedule (MM) 5-4**Schedule Number - 1**

Day Plan No.: 1

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
	X	X	X	X	X	X	X

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

Town of Oakville



MOVING TRAFFIC FORWARD

OAK0219 - Kerr St @ Stewart St - Econolite Type - Cobalt

Controller Timing Plan (MM) 2-1

Plan 1 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	S-L	N-T	N	E-T	N	S-T	N	W-T	N	N	N	N	N	N	N	N
Min Green	6	24	0	10	0	24	0	10	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	14	0	13	0	14	0	13	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	4.0	0.0	4.0	0.0	4.0	0.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	10	30	0	25	0	30	0	25	35	35	35	35	35	35	35	35
Max2	10	40	0	25	0	40	0	25	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.3	3.0	3.3	3.0	3.3	3.0	3.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	0.0	2.1	0.0	2.1	0.0	2.1	0.0	2.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	4.0	4.0	2.0	4.0	2.0	4.0	2.0	4.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Town of Oakville



MOVING TRAFFIC FORWARD

OAK0219 - Kerr St @ Stewart St - Econolite Type - Cobalt

**Coordination Options
Options (MM) 3-1**

Manual Pattern	Auto	ECPI Coord	Yes
System Source	TBC	System Format	STD
Splits In	Percent	Offsets In	Percent
Transition	Smooth	Max Select	MAXINH
Dwell / Add Time	0		
Delay Coord Wk-LZ	No	Force Off	Float
Offset Reference	Lag	Use Ped Time	Yes
Ped Recall	Yes	Ped Reservice	Yes
Local Zero Override	No	FO Added Ini Green	No
Re-sync Count	0	Multisync	No

Auto Perm Minimum Green (Seconds) (MM) 3-4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Split Demand (MM) 3-5

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Demand 1																
Demand 2																

Demand	1	2
Detector	0	0
Call Time (Sec)	0	0
Cycle Count	0	0

Town of Oakville



MOVING TRAFFIC FORWARD

OAK0219 - Kerr St @ Stewart St - Econolite Type - Cobalt

Coordination Pattern Data
Coordinator Pattern Data (MM) 3-2

Coordinator Pattern # 1

Split Pattern	1	TS2 (Pat-Off)	0-1	Splits In	Percent
Cycle	75	Std (COS)	9	Offsets In	Percent
Offset Value	17%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	Yes	Sequence	0		
Phase Reservice	No	Action Plan	1		
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	S-L	N-T	N	E-T	N	S-T	N	W-T	N	N	N	N	N	N	N	N
Splits (Split Pat 1)	14	46	0	40	0	60	0	40	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

Coordinator Pattern # 3

Split Pattern	3	TS2 (Pat-Off)	0-3	Splits In	Percent
Cycle	75	Std (COS)	25	Offsets In	Percent
Offset Value	17%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	Yes	Sequence	0		
Phase Reservice	No	Action Plan	3		
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	S-L	N-T	N	E-T	N	S-T	N	W-T	N	N	N	N	N	N	N	N
Splits (Split Pat 3)	14	46	0	40	0	60	0	40	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

Misc. Data			
Veh Perm 1	0	Veh Perm 2	0
		Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0
		Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

Coordinator Pattern # 5

Split Pattern	5	TS2 (Pat-Off)	1-2	Splits In	Percent
Cycle	75	Std (COS)	41	Offsets In	Percent
Offset Value	17%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	0		
Actuated Walk Rest	Yes	Sequence	0		
Phase Reservice	No	Action Plan	0		
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	S-L	N-T	N	E-T	N	S-T	N	W-T	N	N	N	N	N	N	N	N
Splits (Split Pat 5)	14	46	0	40	0	60	0	40	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	100%	0%	0%

Misc. Data			
Veh Perm 1	0	Veh Perm 2	0
		Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0
		Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Function Outputs																

Town of Oakville



MOVING TRAFFIC FORWARD

OAK0219 - Kerr St @ Stewart St - Econolite Type - Cobalt

Coordination Split Pattern
Split Pattern Data (MM) 3-3
Split Pattern # 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	S-L	N-T	N	E-T	N	S-T	N	W-T	N	N	N	N	N	N	N	N
Split (percent)	14	46	0	40	0	60	0	40	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	100%	0%	0%

Split Pattern # 3

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	S-L	N-T	N	E-T	N	S-T	N	W-T	N	N	N	N	N	N	N	N
Split (percent)	14	46	0	40	0	60	0	40	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	100%	0%	0%

Split Pattern # 5

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	S-L	N-T	N	E-T	N	S-T	N	W-T	N	N	N	N	N	N	N	N
Split (percent)	14	46	0	40	0	60	0	40	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall		X				X										
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	100%	0%	0%

Town of Oakville



MOVING TRAFFIC FORWARD

OAK0219 - Kerr St @ Stewart St - Econolite Type - Cobalt

Time Base Day Plan/Schedule
Day Plan (MM) 5-3**Day Plan #1 - "1"**

Event	Action Plan	Start Time
1	1	07:30
2	2	09:15
3	3	11:00
4	4	13:15
5	5	16:00
6	6	18:15

Day Plan #2 - "2"

Event	Action Plan	Start Time
1	99	00:00
2	2	09:00
3	3	15:00
4	99	19:00

Schedule (MM) 5-4**Schedule Number - 1**

Day Plan No.: 1

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
	X	X	X	X	X	X	X

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

Schedule Number - 2

Day Plan No.: 2

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20	21	22
	23	24	25	26	27	28	29	30	31		

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK1007 - Cornwall Rd @ Cross Ave - Econolite Type - Cobalt

Controller Timing Plan (MM) 2-1

Plan 1 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	N	E-T	N	S-T	E-L	W-T	N	N	N	N	N	N	N	N	N	N
Min Green	0	38	0	10	6	38	0	0	0	0	0	0	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	0	0	0	0	0	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	31	0	18	0	31	0	7	0	7	0	7	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	0.0	5.0	0.0	3.0	3.5	5.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	0	30	0	20	15	30	0	0	0	0	0	0	35	35	35	35
Max2	0	40	0	30	20	40	0	0	0	0	0	0	40	40	40	40
Max3	0	50	0	35	30	50	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.7	3.0	3.3	4.0	3.7	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	0.0	2.9	0.0	2.5	2.0	2.9	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.6	2.0	2.5	2.0	2.6	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	30	30	30	30	30	30	30	30	30	30	30	30	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
---------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK1007 - Cornwall Rd @ Cross Ave - Econolite Type - Cobalt

Coordination Options**Options (MM) 3-1**

Manual Pattern	Auto	ECPI Coord	Yes
System Source	TBC	System Format	STD
Splits In	Percent	Offsets In	Percent
Transition	Smooth	Max Select	MAXINH
Dwell / Add Time	0		
Delay Coord Wk-LZ	No	Force Off	Float
Offset Reference	Lead	Use Ped Time	Yes
Ped Recall	Yes	Ped Reservice	Yes
Local Zero Override	No	FO Added Ini Green	No
Re-sync Count	3	Multisync	Yes

Auto Perm Minimum Green (Seconds) (MM) 3-4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Split Demand (MM) 3-5

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Demand 1																
Demand 2																

Demand	1	2
Detector	0	0
Call Time (Sec)	0	0
Cycle Count	0	0

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK1007 - Cornwall Rd @ Cross Ave - Econolite Type - Cobalt

Coordination Pattern Data
Coordinator Pattern Data (MM) 3-2

Coordinator Pattern # 1

Split Pattern	1	TS2 (Pat-Off)	0-1	Splits In	Percent
Cycle	120	Std (COS)	9	Offsets In	Percent
Offset Value	19%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	Yes	Sequence	0		
Phase	No	Action Plan	1		
Reservice					
Max Select	MAXINH	Force Off	Float		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	N	E-T	N	S-T	E-L	W-T	N	N	N	N	N	N	N	N	N	N
Splits (Split Pat 1)	0	74	0	26	25	49	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	74%	0%	0%

Misc. Data					
Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand	0	Split Demand	0	Crossing Arterial	0
Pat 1		Pat 2		Pat	

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase													X	X	X	X
Special Function Outputs																

Coordinator Pattern # 2

Split Pattern	2	TS2 (Pat-Off)	0-2	Splits In	Percent
Cycle	140	Std (COS)	17	Offsets In	Percent
Offset Value	71%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	Yes	Sequence	0		
Phase	No	Action Plan	2		
Reservice					
Max Select	MAXINH	Force Off	Float		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	N	E-T	N	S-T	E-L	W-T	N	N	N	N	N	N	N	N	N	N
Splits (Split Pat 2)	0	78	0	22	25	53	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	78%	0%	0%

Misc. Data
 Veh Perm 1 0 Veh Perm 2 0 Veh Perm 2 Disp 0
 Split Demand 0 Pat 1 Split Demand 0 Pat 2 Crossing Arterial Pat 0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase													X	X	X	X
Special Function Outputs																

Coordinator Pattern # 3

Split Pattern	3	TS2 (Pat-Off)	0-3	Splits In	Percent
Cycle	120	Std (COS)	25	Offsets In	Percent
Offset Value	76%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	Yes	Sequence	0		
Phase	No	Action Plan	3		
Reservice					
Max Select	MAXINH	Force Off	Float		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	N	E-T	N	S-T	E-L	W-T	N	N	N	N	N	N	N	N	N	N
Splits (Split Pat 3)	0	70	0	30	10	60	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	70%	0%	0%

Misc. Data

Veh Perm 1 0 Veh Perm 2 0 Veh Perm 2 Disp 0
 Split Demand Pat 1 0 Split Demand Pat 2 0 Crossing Arterial Pat 0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase													X	X	X	X
Special Function Outputs																

Coordinator Pattern # 4

Split Pattern	4	TS2 (Pat-Off)	1-1	Splits In	Percent
Cycle	120	Std (COS)	33	Offsets In	Percent
Offset Value	3%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	Yes	Sequence	0		
Phase	No	Action Plan	4		
Reservice					
Max Select	MAXINH	Force Off	Float		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	N	E-T	N	S-T	E-L	W-T	N	N	N	N	N	N	N	N	N	N
Splits (Split Pat 4)	0	63	0	27	10	63	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	90%	73%	0%	0%

Misc. Data
 Veh Perm 1 0 Veh Perm 2 0 Veh Perm 2 Disp 0
 Split Demand Pat 1 0 Split Demand Pat 2 0 Crossing Arterial Pat 0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase													X	X	X	X
Special Function Outputs																

Coordinator Pattern # 5

Split Pattern	5	TS2 (Pat-Off)	1-2	Splits In	Percent
Cycle	140	Std (COS)	41	Offsets In	Percent
Offset Value	9%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	Yes	Sequence	0		
Phase	No	Action Plan	5		
Reservice					
Max Select	MAXINH	Force Off	Float		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	N	E-T	N	S-T	E-L	W-T	N	N	N	N	N	N	N	N	N	N
Splits (Split Pat 5)	0	73	0	27	12	61	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	73%	0%	0%

Misc. Data

Veh Perm 1 0 Veh Perm 2 0 Veh Perm 2 Disp 0
 Split Demand Pat 1 0 Split Demand Pat 2 0 Crossing Arterial Pat 0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase													X	X	X	X
Special Function Outputs																

Coordinator Pattern # 6

Split Pattern	6	TS2 (Pat-Off)	1-3	Splits In	Percent
Cycle	255	Std (COS)	0	Offsets In	Percent
Offset Value	0%	Dwell/Add Time	0		
Actuated Coord	No	Timing Plan	0		
Actuated Walk Rest	No	Sequence	0		
Phase	No	Action Plan	0		
Reservice					
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	N	E-T	N	S-T	E-L	W-T	N	N	N	N	N	N	N	N	N	N
Splits (Split Pat 6)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	0%	0%	0%	0%

Misc. Data
 Veh Perm 1 0 Veh Perm 2 0 Veh Perm 2 Disp 0
 Split Demand Pat 1 0 Split Demand Pat 2 0 Crossing Arterial Pat 0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase																
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase													X	X	X	X
Special Function Outputs																

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK1007 - Cornwall Rd @ Cross Ave - Econolite Type - Cobalt

Coordination Split Pattern
Split Pattern Data (MM) 3-3
Split Pattern # 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	N	E-T	N	S-T	E-L	W-T	N	N	N	N	N	N	N	N	N	N
Split (percent)	0	74	0	26	25	49	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase													X	X	X	X

Ring	1	2	3	4
Split Sum	100%	74%	0%	0%

Split Pattern # 2

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	N	E-T	N	S-T	E-L	W-T	N	N	N	N	N	N	N	N	N	N
Split (percent)	0	78	0	22	25	53	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase													X	X	X	X

Ring	1	2	3	4
Split Sum	100%	78%	0%	0%

Split Pattern # 3

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	N	E-T	N	S-T	E-L	W-T	N	N	N	N	N	N	N	N	N	N
Split (percent)	0	70	0	30	10	60	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																

Pedestrian Recall																
Recall to Max. Time																
Omit Phase													X	X	X	X

Ring	1	2	3	4
Split Sum	100%	70%	0%	0%

Split Pattern # 4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	N	E-T	N	S-T	E-L	W-T	N	N	N	N	N	N	N	N	N	N
Split (percent)	0	63	0	27	10	63	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase													X	X	X	X

Ring	1	2	3	4
Split Sum	90%	73%	0%	0%

Split Pattern # 5

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	N	E-T	N	S-T	E-L	W-T	N	N	N	N	N	N	N	N	N	N
Split (percent)	0	73	0	27	12	61	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase													X	X	X	X

Ring	1	2	3	4
Split Sum	100%	73%	0%	0%

Town of Oakville, ON



MOVING TRAFFIC FORWARD

OAK1007 - Cornwall Rd @ Cross Ave - Econolite Type - Cobalt

Time Base Clock/Calendar**Clock/Calendar Data (MM) 5-1**

Manual Action Plan: 0
SYNC Reference Time: 03:15
SYNC Reference: Reference Time
Day Light Savings: No
Time Reset Input Set Time: 3:30:00
Standard Time From GMT: 0

Town of Oakville, ON



 MOVING TRAFFIC FORWARD

OAK1007 - Cornwall Rd @ Cross Ave - Econolite Type - Cobalt

Time Base Day Plan/Schedule
Day Plan (MM) 5-3
Day Plan #1 - "1"

Event	Action Plan	Start Time
1	1	06:00
2	2	07:00
3	1	09:00
4	3	10:00
5	4	15:15
6	5	17:00
7	3	19:00
8	6	22:00

Day Plan #2 - "2"

Event	Action Plan	Start Time
1	99	00:00
2	2	09:00
3	3	15:00
4	99	19:00

Schedule (MM) 5-4**Schedule Number - 1**

Day Plan No.: 1

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
	X	X	X	X	X	X	X

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

Schedule Number - 2

Day Plan No.: 2

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
	X	X	X	X	X	X	X

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

Appendix H

Synchro Worksheets



Scenario #1

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	35	605	85	180	435	175	95	95	365	345	135	70
Future Volume (vph)	35	605	85	180	435	175	95	95	365	345	135	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	105.0		0.0	75.0		100.0	50.0		45.0	0.0		0.0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	1.00		1.00		0.94	0.96		0.93	0.95		0.98
Frt		0.982				0.850			0.850		0.949	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3469	0	1752	3539	1583	1787	1900	1599	1787	1759	0
Flt Permitted	0.488			0.262			0.623			0.600		
Satd. Flow (perm)	904	3469	0	482	3539	1485	1120	1900	1486	1074	1759	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13				184			266			26
Link Speed (kh)		60			60			50				50
Link Distance (m)		235.8			147.2			127.4				167.2
Travel Time (s)		14.1			8.8			9.2				12.0
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Adj. Flow (vph)	37	637	89	189	458	184	100	100	384	363	142	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	726	0	189	458	184	100	100	384	363	216	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)		3.6			3.6			3.6				3.6
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		1.6			1.6			1.6				1.6
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2	1	1		2
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

EXAM 50 Speers Road 5:24 pm 02/28/2024 Existing AM
BA Group - SUK

Synchro 11 Report
Page 1

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

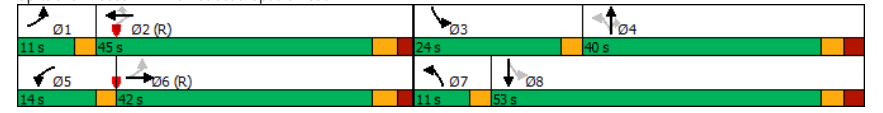
02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2		2	4		4	8		
Detector Phase	1	6		5	2	2	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	7.0	25.0		7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0	
Minimum Split (s)	10.0	30.9		10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3	
Total Split (s)	11.0	42.0		14.0	45.0	45.0	11.0	40.0	40.0	24.0	53.0	
Total Split (%)	9.2%	35.0%		11.7%	37.5%	37.5%	9.2%	33.3%	33.3%	20.0%	44.2%	
Maximum Green (s)	8.0	36.1		11.0	39.1	39.1	8.0	33.7	33.7	21.0	46.7	
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	
All-Red Time (s)	0.0	2.2		0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	5.5		2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	
Walk Time (s)		7.0			7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		14.0			14.0	14.0		14.0	14.0		14.0	
Pedestrian Calls (#/hr)		15			15	15		35	35		35	
Act Effect Green (s)	59.8	49.7		66.7	57.6	57.6	31.3	19.6	19.6	47.3	32.6	
Actuated g/C Ratio	0.50	0.41		0.56	0.48	0.48	0.26	0.16	0.16	0.39	0.27	
v/c Ratio	0.07	0.50		0.49	0.27	0.23	0.30	0.32	0.83	0.66	0.43	
Control Delay	15.9	29.3		19.9	22.0	4.4	24.7	44.5	29.3	32.7	32.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	15.9	29.3		19.9	22.0	4.4	24.7	44.5	29.3	32.7	32.6	
LOS	B	C		B	C	A	C	D	C	C	C	
Approach Delay		28.7			17.6			31.1			32.7	
Approach LOS		C			B			C			C	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 43 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 26.7
 Intersection Capacity Utilization 81.4%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service D

Splits and Phases: 1: Kerr Street & Speers Road



EXAM 50 Speers Road 5:24 pm 02/28/2024 Existing AM
BA Group - SUK

Synchro 11 Report
Page 2

Timings
1: Kerr Street & Speers Road

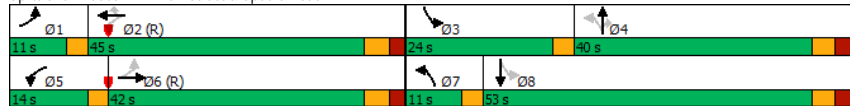
02/28/2024

	↖	→	↙	←	↘	↖	↙	↘	↖	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	35	605	180	435	175	95	95	365	345	135
Future Volume (vph)	35	605	180	435	175	95	95	365	345	135
Turn Type	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	1	6	5	2		7	4		3	8
Permitted Phases	6		2		2	4		4	8	
Detector Phase	1	6	5	2	2	7	4	4	3	8
Switch Phase										
Minimum Initial (s)	7.0	25.0	7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0
Minimum Split (s)	10.0	30.9	10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3
Total Split (s)	11.0	42.0	14.0	45.0	45.0	11.0	40.0	40.0	24.0	53.0
Total Split (%)	9.2%	35.0%	11.7%	37.5%	37.5%	9.2%	33.3%	33.3%	20.0%	44.2%
Yellow Time (s)	3.0	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3
All-Red Time (s)	0.0	2.2	0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	None	C-Min	C-Min	None	None	None	None	None
Act Effect Green (s)	59.8	49.7	66.7	57.6	57.6	31.3	19.6	19.6	47.3	32.6
Actuated g/C Ratio	0.50	0.41	0.56	0.48	0.48	0.26	0.16	0.16	0.39	0.27
v/c Ratio	0.07	0.50	0.49	0.27	0.23	0.30	0.32	0.83	0.66	0.43
Control Delay	15.9	29.3	19.9	22.0	4.4	24.7	44.5	29.3	32.7	32.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.9	29.3	19.9	22.0	4.4	24.7	44.5	29.3	32.7	32.6
LOS	B	C	B	C	A	C	D	C	C	C
Approach Delay		28.7		17.6			31.1			32.7
Approach LOS		C		B			C			C

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 43 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 26.7
 Intersection LOS: C
 Intersection Capacity Utilization 81.4%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 1: Kerr Street & Speers Road



Queues
1: Kerr Street & Speers Road

02/28/2024

	↖	→	↙	←	↘	↖	↙	↘	↖	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	37	726	189	458	184	100	100	384	363	216
v/c Ratio	0.07	0.50	0.49	0.27	0.23	0.30	0.32	0.83	0.66	0.43
Control Delay	15.9	29.3	19.9	22.0	4.4	24.7	44.5	29.3	32.7	32.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.9	29.3	19.9	22.0	4.4	24.7	44.5	29.3	32.7	32.6
Queue Length 50th (m)	4.0	67.6	22.4	36.7	0.0	14.3	20.8	26.7	61.6	36.0
Queue Length 95th (m)	10.8	99.2	41.7	56.6	14.9	22.1	32.8	58.0	77.1	50.9
Internal Link Dist (m)		211.8		123.2			103.4			143.2
Turn Bay Length (m)	105.0		75.0		100.0	50.0		45.0		
Base Capacity (vph)	516	1444	396	1700	808	341	533	608	552	700
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.50	0.48	0.27	0.23	0.29	0.19	0.63	0.66	0.31

Intersection Summary

HCM Signalized Intersection Capacity Analysis

1: Kerr Street & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	35	605	85	180	435	175	95	95	365	345	135	70
Future Volume (vph)	35	605	85	180	435	175	95	95	365	345	135	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frb, ped/bikes	1.00	1.00		1.00	1.00	0.94	1.00	1.00	0.93	1.00	0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00	1.00	0.97	1.00	1.00	0.97	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1782	3468		1751	3539	1485	1739	1900	1486	1737	1759	
Flt Permitted	0.49	1.00		0.26	1.00	1.00	0.62	1.00	1.00	0.60	1.00	
Satd. Flow (perm)	916	3468		483	3539	1485	1141	1900	1486	1098	1759	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	37	637	89	189	458	184	100	100	384	363	142	74
RTOR Reduction (vph)	0	8	0	0	0	97	0	0	223	0	19	0
Lane Group Flow (vph)	37	718	0	189	458	87	100	100	161	363	197	0
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2		2	4		4	8		
Actuated Green, G (s)	54.2	49.8		63.9	56.5	56.5	27.9	19.6	19.6	43.9	32.6	
Effective Green, g (s)	54.2	49.8		63.9	56.5	56.5	27.9	19.6	19.6	43.9	32.6	
Actuated g/C Ratio	0.45	0.41		0.53	0.47	0.47	0.23	0.16	0.16	0.37	0.27	
Clearance Time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Vehicle Extension (s)	2.5	5.5		2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	
Lane Grp Cap (vph)	445	1439		374	1666	699	306	310	242	515	477	
v/s Ratio Prot	0.00	0.21		c0.05	0.13		0.02	0.05		c0.13	0.11	
v/s Ratio Perm	0.03			c0.22		0.06	0.05		0.11	c0.13		
v/c Ratio	0.08	0.50		0.51	0.27	0.12	0.33	0.32	0.67	0.70	0.41	
Uniform Delay, d1	18.4	25.9		16.2	19.3	17.8	37.5	44.3	47.1	30.6	35.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	1.2		0.8	0.4	0.4	0.5	0.8	7.4	4.0	0.8	
Delay (s)	18.5	27.1		17.0	19.7	18.2	38.0	45.2	54.6	34.6	36.6	
Level of Service	B	C		B	B	B	D	D	D	C	D	
Approach Delay (s)		26.7			18.7			50.1			35.4	
Approach LOS		C			B			D			D	

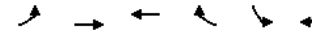
Intersection Summary		
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.62	C
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	81.4%	ICU Level of Service
Analysis Period (min)	15	D

c Critical Lane Group

Lanes, Volumes, Timings

2: Speers Road & Cross Avenue

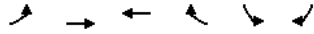
02/28/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	185	1155	560	20	5	220
Future Volume (vph)	185	1155	560	20	5	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	80.0		0.0	45.0	0.0	
Storage Lanes	1		0	1	2	
Taper Length (m)	2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	0.88
Ped Bike Factor	1.00		1.00			
Frt			0.995			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1703	3610	3554	0	1805	2733
Flt Permitted	0.395				0.950	
Satd. Flow (perm)	706	3610	3554	0	1805	2733
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			4			229
Link Speed (k/h)		60	60		48	
Link Distance (m)		233.1	101.5		84.0	
Travel Time (s)		14.0	6.1		6.3	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Adj. Flow (vph)	193	1203	583	21	5	229
Shared Lane Traffic (%)						
Lane Group Flow (vph)	193	1203	604	0	5	229
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
2: Speers Road & Cross Avenue

02/28/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	pm+pt	NA	NA	Prot	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Detector Phase	5	2	6		4	4
Switch Phase						
Minimum Initial (s)	6.0	38.0	38.0		10.0	10.0
Minimum Split (s)	12.0	47.6	47.6		15.8	15.8
Total Split (s)	35.0	109.0	74.0		31.0	31.0
Total Split (%)	25.0%	77.9%	52.9%		22.1%	22.1%
Maximum Green (s)	29.0	102.4	67.4		25.2	25.2
Yellow Time (s)	4.0	3.7	3.7		3.3	3.3
All-Red Time (s)	2.0	2.9	2.9		2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6		5.8	5.8
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Recall Mode	None	C-Min	C-Min		None	None
Walk Time (s)		10.0	10.0			
Flash Dont Walk (s)		31.0	31.0			
Pedestrian Calls (#/hr)		5	5			
Act Effect Green (s)	118.0	117.4	102.6		10.2	10.2
Actuated g/C Ratio	0.84	0.84	0.73		0.07	0.07
v/c Ratio	0.29	0.40	0.23		0.04	0.56
Control Delay	3.1	3.2	6.3		61.0	12.9
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	3.1	3.2	6.3		61.0	12.9
LOS	A	A	A		E	B
Approach Delay		3.2	6.3		13.9	
Approach LOS		A	A		B	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 99 (71%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.56
 Intersection Signal Delay: 5.1 Intersection LOS: A
 Intersection Capacity Utilization 68.1% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: Speers Road & Cross Avenue



Timings
2: Speers Road & Cross Avenue

02/28/2024

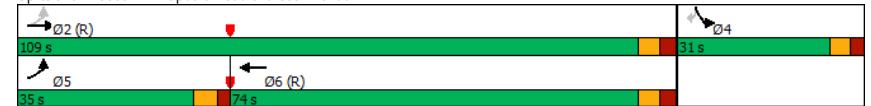


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↕↕	↕↕	↔	↕↕
Traffic Volume (vph)	185	1155	560	5	220
Future Volume (vph)	185	1155	560	5	220
Turn Type	pm+pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2				4
Detector Phase	5	2	6	4	4
Switch Phase					
Minimum Initial (s)	6.0	38.0	38.0	10.0	10.0
Minimum Split (s)	12.0	47.6	47.6	15.8	15.8
Total Split (s)	35.0	109.0	74.0	31.0	31.0
Total Split (%)	25.0%	77.9%	52.9%	22.1%	22.1%
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	None	None
Act Effect Green (s)	118.0	117.4	102.6	10.2	10.2
Actuated g/C Ratio	0.84	0.84	0.73	0.07	0.07
v/c Ratio	0.29	0.40	0.23	0.04	0.56
Control Delay	3.1	3.2	6.3	61.0	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.1	3.2	6.3	61.0	12.9
LOS	A	A	A	E	B
Approach Delay		3.2	6.3	13.9	
Approach LOS		A	A	B	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 99 (71%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.56
 Intersection Signal Delay: 5.1 Intersection LOS: A
 Intersection Capacity Utilization 68.1% ICU Level of Service C
 Analysis Period (min) 15

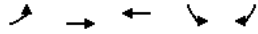
Splits and Phases: 2: Speers Road & Cross Avenue



Queues

2: Speers Road & Cross Avenue

02/28/2024



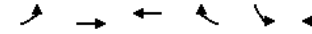
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	193	1203	604	5	229
w/c Ratio	0.29	0.40	0.23	0.04	0.56
Control Delay	3.1	3.2	6.3	61.0	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.1	3.2	6.3	61.0	12.9
Queue Length 50th (m)	7.3	32.9	25.0	1.3	0.0
Queue Length 95th (m)	11.7	40.9	34.1	5.8	13.9
Internal Link Dist (m)		209.1	77.5	60.0	
Turn Bay Length (m)	80.0		45.0		
Base Capacity (vph)	801	3028	2606	324	679
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.24	0.40	0.23	0.02	0.34

Intersection Summary

HCM Signalized Intersection Capacity Analysis

2: Speers Road & Cross Avenue

02/28/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕↕	↕↕		↔	↕↕
Traffic Volume (vph)	185	1155	560	20	5	220
Future Volume (vph)	185	1155	560	20	5	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.6	6.6		5.8	5.8
Lane Util. Factor	1.00	0.95	0.95		1.00	0.88
Frbp, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1701	3610	3553		1805	2733
Flt Permitted	0.39	1.00	1.00		0.95	1.00
Satd. Flow (perm)	706	3610	3553		1805	2733
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	193	1203	583	21	5	229
RTOR Reduction (vph)	0	0	1	0	0	212
Lane Group Flow (vph)	193	1203	603	0	5	17
Confl. Peds. (#/hr)	5			5		
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	117.4	117.4	102.6		10.2	10.2
Effective Green, g (s)	117.4	117.4	102.6		10.2	10.2
Actuated g/C Ratio	0.84	0.84	0.73		0.07	0.07
Clearance Time (s)	6.0	6.6	6.6		5.8	5.8
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Lane Grp Cap (vph)	654	3027	2603		131	199
v/s Ratio Prot	0.02	c0.33	0.17		0.00	
v/s Ratio Perm	0.23					c0.01
w/c Ratio	0.30	0.40	0.23		0.04	0.08
Uniform Delay, d1	2.3	2.7	6.0		60.3	60.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.3	0.4	0.2		0.1	0.2
Delay (s)	2.6	3.1	6.2		60.5	60.7
Level of Service	A	A	A		E	E
Approach Delay (s)		3.1	6.2		60.7	
Approach LOS		A	A		E	

Intersection Summary

HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

3: St. Augustine Drive & Speers Road

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕			↕				↕		↕	
Traffic Volume (vph)	5	675	15	0	580	20	5	0	50	0	0	0
Future Volume (vph)	5	675	15	0	580	20	5	0	50	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		1	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.995				0.865			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1805	3561	0	0	3558	0	0	0	1644	0	1900	0
Flt Permitted	0.950							0.950				
Satd. Flow (perm)	1805	3561	0	0	3558	0	0	0	1644	0	1900	0
Link Speed (k/h)		60			60				40			30
Link Distance (m)		248.1			235.8				188.1			117.6
Travel Time (s)		14.9			14.1				16.9			14.1
Confl. Peds. (#/hr)	8		5	5		8	1		1	1		1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	5	703	16	0	604	21	5	0	52	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	719	0	0	625	0	0	5	52	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6				0.0			0.0
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		1.6			1.6				1.6			1.6
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free				Stop			Stop

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

3: St. Augustine Drive & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕			↕				↕		↕	
Traffic Volume (veh/h)	5	675	15	0	580	20	5	0	50	0	0	0
Future Volume (Veh/h)	5	675	15	0	580	20	5	0	50	0	0	0
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	703	16	0	604	21	5	0	52	0	0	0
Pedestrians	1			1			5			8		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	0			0			0			1		
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)	236											
pX, platoon unblocked	0.93						0.93			0.93		
vC, conflicting volume	633			724			1029			1359		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	459			724			884			1238		
tC, single (s)	4.1			4.1			7.5			6.5		
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5			4.0		
p0 queue free %	100			100			98			100		
cM capacity (veh/h)	1029			884			222			162		

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	5	469	250	403	222	57	0
Volume Left	5	0	0	0	0	5	0
Volume Right	0	0	16	0	21	52	0
cSH	1029	1700	1700	1700	1700	545	1700
Volume to Capacity	0.00	0.28	0.15	0.24	0.13	0.10	0.00
Queue Length 95th (m)	0.1	0.0	0.0	0.0	0.0	2.6	0.0
Control Delay (s)	8.5	0.0	0.0	0.0	0.0	12.4	0.0
Lane LOS	A				B		A
Approach Delay (s)	0.1			0.0			12.4
Approach LOS				B			A

Intersection Summary	
Average Delay	0.5
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min)	15

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

02/28/2024

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙		↖			↘
Traffic Volume (vph)	70	145	250	55	90	480
Future Volume (vph)	70	145	250	55	90	480
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor	0.98		1.00			1.00
Frt	0.909		0.973			
Flt Protected	0.984					0.992
Satd. Flow (prot)	1652	0	3454	0	0	3551
Flt Permitted	0.984					0.846
Satd. Flow (perm)	1645	0	3454	0	0	3026
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	125		37			
Link Speed (kh)	50		50			50
Link Distance (m)	265.3		167.2			26.5
Travel Time (s)	19.1		12.0			1.9
Confl. Peds. (#/hr)	13	6		4	4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	1%	1%	2%	0%	1%
Adj. Flow (vph)	72	149	258	57	93	495
Shared Lane Traffic (%)						
Lane Group Flow (vph)	221	0	315	0	0	588
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1		2		1	2
Detector Template	Left		Thru		Left	Thru
Leading Detector (m)	2.0		10.0		2.0	10.0
Trailing Detector (m)	0.0		0.0		0.0	0.0
Detector 1 Position(m)	0.0		0.0		0.0	0.0
Detector 1 Size(m)	2.0		0.6		2.0	0.6
Detector 1 Type	CI+Ex		CI+Ex		CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0		0.0	0.0
Detector 1 Queue (s)	0.0		0.0		0.0	0.0
Detector 1 Delay (s)	0.0		0.0		0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			CI+Ex			CI+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases					6	

EXAM 50 Speers Road 5:24 pm 02/28/2024 Existing AM
BA Group - SUK

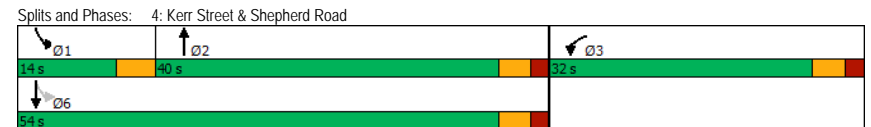
Synchro 11 Report
Page 13

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

02/28/2024

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	3		2		1	6
Switch Phase						
Minimum Initial (s)	10.0		18.0		7.0	18.0
Minimum Split (s)	31.4		28.2		11.0	28.2
Total Split (s)	32.0		40.0		14.0	54.0
Total Split (%)	37.2%		46.5%		16.3%	62.8%
Maximum Green (s)	26.6		34.8		10.0	48.8
Yellow Time (s)	3.3		3.3		4.0	3.3
All-Red Time (s)	2.1		1.9		0.0	1.9
Lost Time Adjust (s)	0.0		0.0			0.0
Total Lost Time (s)	5.4		5.2			5.2
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.5		2.5	3.5
Recall Mode	None		Min		None	Min
Walk Time (s)	10.0		10.0			10.0
Flash Dont Walk (s)	16.0		13.0			13.0
Pedestrian Calls (#/hr)	0		5			5
Act Effect Green (s)	10.3		19.3			19.3
Actuated g/C Ratio	0.26		0.48			0.48
v/c Ratio	0.43		0.19			0.40
Control Delay	9.3		5.6			7.8
Queue Delay	0.0		0.0			0.0
Total Delay	9.3		5.6			7.8
LOS	A		A			A
Approach Delay	9.3		5.6			7.8
Approach LOS	A		A			A

Intersection Summary	
Area Type:	Other
Cycle Length:	86
Actuated Cycle Length:	40.3
Natural Cycle:	75
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.43
Intersection Signal Delay:	7.5
Intersection Capacity Utilization:	59.3%
Intersection LOS:	A
ICU Level of Service:	B
Analysis Period (min):	15



EXAM 50 Speers Road 5:24 pm 02/28/2024 Existing AM
BA Group - SUK

Synchro 11 Report
Page 14

Timings
4: Kerr Street & Shepherd Road

02/28/2024

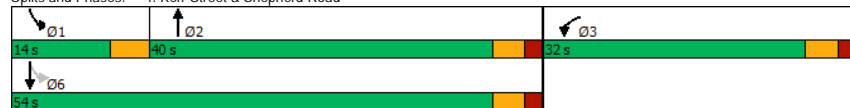
	↙	↑	↘	↓
Lane Group	WBL	NBT	SBL	SBT
Lane Configurations	↔	↑↓	↔	↑↓
Traffic Volume (vph)	70	250	90	480
Future Volume (vph)	70	250	90	480
Turn Type	Prot	NA	pm+pt	NA
Protected Phases	3	2	1	6
Permitted Phases			6	
Detector Phase	3	2	1	6
Switch Phase				
Minimum Initial (s)	10.0	18.0	7.0	18.0
Minimum Split (s)	31.4	28.2	11.0	28.2
Total Split (s)	32.0	40.0	14.0	54.0
Total Split (%)	37.2%	46.5%	16.3%	62.8%
Yellow Time (s)	3.3	3.3	4.0	3.3
All-Red Time (s)	2.1	1.9	0.0	1.9
Lost Time Adjust (s)	0.0	0.0		0.0
Total Lost Time (s)	5.4	5.2		5.2
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	None	Min	None	Min
Act Effct Green (s)	10.3	19.3		19.3
Actuated g/C Ratio	0.26	0.48		0.48
v/c Ratio	0.43	0.19		0.40
Control Delay	9.3	5.6		7.8
Queue Delay	0.0	0.0		0.0
Total Delay	9.3	5.6		7.8
LOS	A	A		A
Approach Delay	9.3	5.6		7.8
Approach LOS	A	A		A

Intersection Summary

Cycle Length: 86
 Actuated Cycle Length: 40.3
 Natural Cycle: 75
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.43
 Intersection Signal Delay: 7.5
 Intersection Capacity Utilization 59.3%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 4: Kerr Street & Shepherd Road



Queues
4: Kerr Street & Shepherd Road

02/28/2024

	↙	↑	↓
Lane Group	WBL	NBT	SBT
Lane Group Flow (vph)	221	315	588
v/c Ratio	0.43	0.19	0.40
Control Delay	9.3	5.6	7.8
Queue Delay	0.0	0.0	0.0
Total Delay	9.3	5.6	7.8
Queue Length 50th (m)	4.9	4.9	11.8
Queue Length 95th (m)	18.8	10.0	21.2
Internal Link Dist (m)	241.3	143.2	2.5
Turn Bay Length (m)			
Base Capacity (vph)	1137	3001	3026
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.19	0.10	0.19

Intersection Summary

--

HCM Signalized Intersection Capacity Analysis

4: Kerr Street & Shepherd Road

02/28/2024



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↕	↕	↔	↔
Traffic Volume (vph)	70	145	250	55	90	480
Future Volume (vph)	70	145	250	55	90	480
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4		5.2			5.2
Lane Util. Factor	1.00		0.95			0.95
Frb, ped/bikes	0.99		1.00			1.00
Flpb, ped/bikes	1.00		1.00			1.00
Frt	0.91		0.97			1.00
Flt Protected	0.98		1.00			0.99
Satd. Flow (prot)	1655		3456			3551
Flt Permitted	0.98		1.00			0.85
Satd. Flow (perm)	1655		3456			3028
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	72	149	258	57	93	495
RTOR Reduction (vph)	93	0	19	0	0	0
Lane Group Flow (vph)	128	0	296	0	0	588
Confl. Peds. (#/hr)	13	6		4	4	
Heavy Vehicles (%)	3%	1%	1%	2%	0%	1%
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases					6	
Actuated Green, G (s)	10.3		19.3			19.3
Effective Green, g (s)	10.3		19.3			19.3
Actuated g/C Ratio	0.26		0.48			0.48
Clearance Time (s)	5.4		5.2			5.2
Vehicle Extension (s)	3.0		3.5			3.5
Lane Grp Cap (vph)	424		1659			1453
v/s Ratio Prot	c0.08		0.09			
v/s Ratio Perm						c0.19
v/c Ratio	0.30		0.18			0.40
Uniform Delay, d1	12.1		5.9			6.7
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	0.4		0.1			0.2
Delay (s)	12.5		6.0			7.0
Level of Service	B		A			A
Approach Delay (s)	12.5		6.0			7.0
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	40.2	Sum of lost time (s)	14.6
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

5: Kerr Street & Wyecroft Road

02/28/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↕	↕	↕	↕
Traffic Volume (vph)	5	80	160	235	490	125
Future Volume (vph)	5	80	160	235	490	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	75.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.872				0.973	
Flt Protected	0.997		0.950			
Satd. Flow (prot)	1592	0	1703	1900	1834	0
Flt Permitted	0.997		0.950			
Satd. Flow (perm)	1592	0	1703	1900	1834	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	561.6			442.6	98.1	
Travel Time (s)	40.4			31.9	7.1	
Confl. Peds. (#/hr)			5			5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	4%	6%	0%	0%	4%
Adj. Flow (vph)	5	85	170	250	521	133
Shared Lane Traffic (%)						
Lane Group Flow (vph)	90	0	170	250	654	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Right	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	57.6%
ICU Level of Service	B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

5: Kerr Street & Wynecroft Road

02/28/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	5	80	160	235	490	125
Future Volume (Veh/h)	5	80	160	235	490	125
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	5	85	170	250	521	133
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1182	592	659			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1182	592	659			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	97	83	81			
cM capacity (veh/h)	171	500	906			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	90	170	250	654		
Volume Left	5	170	0	0		
Volume Right	85	0	0	133		
cSH	452	906	1700	1700		
Volume to Capacity	0.20	0.19	0.15	0.38		
Queue Length 95th (m)	5.6	5.2	0.0	0.0		
Control Delay (s)	14.9	9.9	0.0	0.0		
Lane LOS	B	A				
Approach Delay (s)	14.9	4.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay	2.6					
Intersection Capacity Utilization	57.6%		ICU Level of Service		B	
Analysis Period (min)	15					

Lanes, Volumes, Timings

6: Kerr Street & Prince Charles Drive

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	5	0	5	5	0	75	5	475	5	40	355	5
Future Volume (vph)	5	0	5	5	0	75	5	475	5	40	355	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.932		0.873		0.999		0.998					
Flt Protected	0.976		0.997		0.995		0.995					
Satd. Flow (prot)	0	1728	0	0	1654	0	0	1876	0	0	1844	0
Flt Permitted	0.976		0.997		0.995		0.995					
Satd. Flow (perm)	0	1728	0	0	1654	0	0	1876	0	0	1844	0
Link Speed (k/h)	40		40		50		50					
Link Distance (m)	57.8		56.0		134.8		127.4					
Travel Time (s)	5.2		5.0		9.7		9.2					
Confl. Peds. (#/hr)	4	1		1	4	21	31		31	21		
Confl. Bikes (#/hr)							1		1			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	50%	0%	0%	0%	0%	20%	1%	0%	5%	2%	4%
Adj. Flow (vph)	5	0	5	5	0	79	5	500	5	42	374	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	10	0	0	84	0	0	510	0	0	421	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0		0.0		0.0		0.0		3.6			
Link Offset(m)	0.0		0.0		0.0		0.0		0.0			
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6			
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14		24	14		24	14		24	14	
Sign Control	Stop		Stop		Free		Free		Free			
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	58.1%						ICU Level of Service B					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

6: Kerr Street & Prince Charles Drive

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	5	0	5	5	0	75	5	475	5	40	355	5
Future Volume (Veh/h)	5	0	5	5	0	75	5	475	5	40	355	5
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	0	5	5	0	79	5	500	5	42	374	5
Pedestrians	21			31			1			4		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	2			3			0			0		
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (m)							238					
pX, platoon unblocked	0.91	0.91	0.89	0.91	0.91	0.96	0.89					0.96
vC, conflicting volume	1077	1028	398	1010	1028	538	400					536
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	926	871	262	852	871	492	263					491
tC, single (s)	7.1	7.0	6.2	7.1	6.5	6.2	4.3					4.1
tC, 2 stage (s)												
tF (s)	3.5	4.5	3.3	3.5	4.0	3.3	2.4					2.2
p0 queue free %	97	100	99	98	100	85	100					96
cM capacity (veh/h)	178	201	682	230	241	537	1050					981
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	10	84	510	421								
Volume Left	5	5	5	42								
Volume Right	5	79	5	5								
cSH	282	497	1050	981								
Volume to Capacity	0.04	0.17	0.00	0.04								
Queue Length 95th (m)	0.8	4.6	0.1	1.0								
Control Delay (s)	18.2	13.7	0.1	1.3								
Lane LOS	C	B	A	A								
Approach Delay (s)	18.2	13.7	0.1	1.3								
Approach LOS	C	B										
Intersection Summary												
Average Delay				1.9								
Intersection Capacity Utilization				58.1%	ICU Level of Service							B
Analysis Period (min)				15								

Lanes, Volumes, Timings

7: Kerr Street & Elmwood Road

02/28/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	30	10	5	455	320	45
Future Volume (vph)	30	10	5	455	320	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.965				0.983	
Fit Protected	0.964				0.999	
Satd. Flow (prot)	1723		0		1857 1820 0	
Fit Permitted	0.964				0.999	
Satd. Flow (perm)	1723		0		1857 1820 0	
Link Speed (k/h)	40				50 50	
Link Distance (m)	171.2				103.0 134.8	
Travel Time (s)	15.4				7.4 9.7	
Confl. Peds. (#/hr)	1	2	34			34
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	10%	20%	2%	2%	7%
Adj. Flow (vph)	32	11	5	479	337	47
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	0	0	484	384	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6				0.0 0.0	
Link Offset(m)	0.0				0.0 0.0	
Crosswalk Width(m)	1.6				1.6 1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14		24	
Sign Control	Stop				Free Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	38.6%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

7: Kerr Street & Elmwood Road

02/28/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	[Diagram]					
Traffic Volume (veh/h)	30	10	5	455	320	45
Future Volume (Veh/h)	30	10	5	455	320	45
Sign Control	Stop		Free			
Grade	0%		0%			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	32	11	5	479	337	47
Pedestrians	34		2			
Lane Width (m)	3.6		3.6			
Walking Speed (m/s)	1.1		1.1			
Percent Blockage	3		0			
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)			103		262	
pX, platoon unblocked	0.93	0.98	0.98			
vC, conflicting volume	884	396	418			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	786	373	395			
tC, single (s)	6.4	6.3	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.4			
p0 queue free %	90	98	100			
cM capacity (veh/h)	325	621	1017			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	43	484	384			
Volume Left	32	5	0			
Volume Right	11	0	47			
cSH	370	1017	1700			
Volume to Capacity	0.12	0.00	0.23			
Queue Length 95th (m)	3.0	0.1	0.0			
Control Delay (s)	16.0	0.1	0.0			
Lane LOS	C	A				
Approach Delay (s)	16.0	0.1	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay	0.8					
Intersection Capacity Utilization	38.6%		ICU Level of Service		A	
Analysis Period (min)	15					

Lanes, Volumes, Timings

8: Kerr Street & Stewart Street

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	[Diagram]											
Traffic Volume (vph)	35	25	5	15	35	70	5	355	20	40	260	30
Future Volume (vph)	35	25	5	15	35	70	5	355	20	40	260	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98		0.97		1.00		1.00		0.99		0.99	
Frt	0.990		0.921		0.993		0.988		0.994		0.988	
Flt Protected	0.974		0.994		0.999		0.994		0.994		0.994	
Satd. Flow (prot)	0	1679	0	0	1607	0	0	1845	0	0	1822	0
Flt Permitted	0.806		0.957		0.997		0.923		0.923		0.923	
Satd. Flow (perm)	0	1369	0	0	1543	0	0	1841	0	0	1689	0
Right Turn on Red			Yes		Yes		Yes		Yes		Yes	
Satd. Flow (RTOR)	5		76		4		10		50		50	
Link Speed (k/h)	40		40		50		103.0		7.4		7.4	
Link Distance (m)	95.6		60.6		165.0		103.0		7.4		7.4	
Travel Time (s)	8.6		5.5		11.9		7.4		7.4		7.4	
Confl. Peds. (#/hr)	20	15	15	20	35	25	25	35	25	25	35	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Adj. Flow (vph)	38	27	5	16	38	76	5	386	22	43	283	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	70	0	0	130	0	0	413	0	0	359	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6		1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24	14	24	14	24	14	24	14	24	14
Number of Detectors	1	2	1	2	1	2	1	2	1	2	1	2
Detector Template	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left	Thru
Leading Detector (m)	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
Detector 2 Size(m)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Detector 2 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 2 Channel												
Detector 2 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA	NA	NA
Protected Phases	4		8		8		2		1		6	
Permitted Phases	4		8		8		2		1		6	

Lanes, Volumes, Timings
8: Kerr Street & Stewart Street

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		24.0	24.0		6.0	24.0	
Minimum Split (s)	30.0	30.0		30.0	30.0		32.0	32.0		10.0	32.0	
Total Split (s)	30.0	30.0		30.0	30.0		35.0	35.0		10.0	45.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		46.7%	46.7%		13.3%	60.0%	
Maximum Green (s)	24.6	24.6		24.6	24.6		29.6	29.6		7.0	39.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.0	3.3	
All-Red Time (s)	2.1	2.1		2.1	2.1		2.1	2.1		0.0	2.1	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.4			5.4			5.4			5.4	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
Recall Mode	None	None		None	None		C-Min	C-Min		None	C-Min	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	20	20		20	20		35	35		35	35	
Act Effect Green (s)		15.2			15.2			53.2			53.2	
Actuated g/C Ratio		0.20			0.20			0.71			0.71	
v/c Ratio		0.25			0.35			0.32			0.30	
Control Delay		23.5			13.2			7.6			7.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		23.5			13.2			7.6			7.4	
LOS		C			B			A			A	
Approach Delay		23.5			13.2			7.6			7.4	
Approach LOS		C			B			A			A	

Intersection Summary

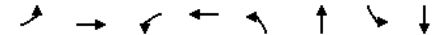
Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.35
 Intersection Signal Delay: 9.4 Intersection LOS: A
 Intersection Capacity Utilization 63.8% ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 8: Kerr Street & Stewart Street



Timings
8: Kerr Street & Stewart Street

02/28/2024

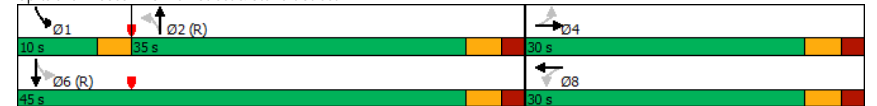


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔		↔		↔	↔		↔
Traffic Volume (vph)	35	25		15	35	5	355	40	260
Future Volume (vph)	35	25		15	35	5	355	40	260
Turn Type	Perm	NA		Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6	
Permitted Phases	4			8		2	6		
Detector Phase	4	4		8	8	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0		10.0	10.0	24.0	24.0	6.0	24.0
Minimum Split (s)	30.0	30.0		30.0	30.0	32.0	32.0	10.0	32.0
Total Split (s)	30.0	30.0		30.0	30.0	35.0	35.0	10.0	45.0
Total Split (%)	40.0%	40.0%		40.0%	40.0%	46.7%	46.7%	13.3%	60.0%
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	3.3	3.0	3.3
All-Red Time (s)	2.1	2.1		2.1	2.1	2.1	2.1	0.0	2.1
Lost Time Adjust (s)		0.0			0.0		0.0		0.0
Total Lost Time (s)		5.4			5.4		5.4		5.4
Lead/Lag						Lag	Lag	Lead	
Lead-Lag Optimize?						Yes	Yes	Yes	
Recall Mode	None	None		None	None	C-Min	C-Min	None	C-Min
Act Effect Green (s)		15.2			15.2		53.2		53.2
Actuated g/C Ratio		0.20			0.20		0.71		0.71
v/c Ratio		0.25			0.35		0.32		0.30
Control Delay		23.5			13.2		7.6		7.4
Queue Delay		0.0			0.0		0.0		0.0
Total Delay		23.5			13.2		7.6		7.4
LOS		C			B		A		A
Approach Delay		23.5			13.2		7.6		7.4
Approach LOS		C			B		A		A

Intersection Summary

Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.35
 Intersection Signal Delay: 9.4 Intersection LOS: A
 Intersection Capacity Utilization 63.8% ICU Level of Service B
 Analysis Period (min) 15

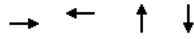
Splits and Phases: 8: Kerr Street & Stewart Street



Queues

8: Kerr Street & Stewart Street

02/28/2024



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	70	130	413	359
w/c Ratio	0.25	0.35	0.32	0.30
Control Delay	23.5	13.2	7.6	7.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.5	13.2	7.6	7.4
Queue Length 50th (m)	8.5	7.0	16.5	13.8
Queue Length 95th (m)	15.7	17.1	49.5	42.9
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)				
Base Capacity (vph)	452	557	1306	1200
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced w/c Ratio	0.15	0.23	0.32	0.30
Intersection Summary				

HCM Signalized Intersection Capacity Analysis

8: Kerr Street & Stewart Street

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	35	25	5	15	35	70	5	355	20	40	260	30
Future Volume (vph)	35	25	5	15	35	70	5	355	20	40	260	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.4			5.4			5.4			5.4	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		1.00			0.97			1.00			0.99	
Flpb, ped/bikes		0.99			1.00			1.00			1.00	
Frt		0.99			0.92			0.99			0.99	
Flt Protected		0.97			0.99			1.00			0.99	
Satd. Flow (prot)		1655			1602			1845			1817	
Flt Permitted		0.81			0.96			1.00			0.92	
Satd. Flow (perm)		1370			1544			1839			1687	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	27	5	16	38	76	5	386	22	43	283	33
RTOR Reduction (vph)	0	4	0	0	63	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	66	0	0	67	0	0	412	0	0	356	0
Confl. Peds. (#/hr)	20		15	15		20	35		25	25		35
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2			1	6
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.2			13.2			51.0			51.0	
Effective Green, g (s)		13.2			13.2			51.0			51.0	
Actuated g/C Ratio		0.18			0.18			0.68			0.68	
Clearance Time (s)		5.4			5.4			5.4			5.4	
Vehicle Extension (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		241			271			1250			1147	
v/s Ratio Prot												
v/s Ratio Perm		c0.05			0.04			c0.22			0.21	
v/c Ratio		0.27			0.25			0.33			0.31	
Uniform Delay, d1		26.7			26.6			4.9			4.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.8			0.7			0.7			0.2	
Delay (s)		27.6			27.3			5.7			5.0	
Level of Service		C			C			A			A	
Approach Delay (s)		27.6			27.3			5.7			5.0	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay				9.9				HCM 2000 Level of Service			A	
HCM 2000 Volume to Capacity ratio				0.33								
Actuated Cycle Length (s)				75.0				Sum of lost time (s)			13.8	
Intersection Capacity Utilization				63.8%				ICU Level of Service			B	
Analysis Period (min)				15								

c Critical Lane Group

Lanes, Volumes, Timings

9: Speers Internal Road 1 & Speers Road

02/28/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕	↕	↕
Traffic Volume (vph)	1310	5	0	785	5	0
Future Volume (vph)	1310	5	0	785	5	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt	0.999					
Flt Protected					0.950	
Satd. Flow (prot)	3606	0	0	3610	1805	0
Flt Permitted	0.950					
Satd. Flow (perm)	3606	0	0	3610	1805	0
Link Speed (k/h)	60		60		20	
Link Distance (m)	147.2		113.4		44.5	
Travel Time (s)	8.8		6.8		8.0	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1337	5	0	801	5	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1342	0	0	801	5	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	14		24		24	
Sign Control	Free		Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	46.4%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

9: Speers Internal Road 1 & Speers Road

02/28/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕	↕	↕
Traffic Volume (veh/h)	1310	5	0	785	5	0
Future Volume (Veh/h)	1310	5	0	785	5	0
Sign Control	Free			Stop		
Grade	0%					
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	1337	5	0	801	5	0
Pedestrians	1			1		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	147			347		
pX, platoon unblocked				0.86	0.87	0.86
vC, conflicting volume				1342	1741	672
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				1070	1422	290
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				100	96	100
cM capacity (veh/h)				566	113	611

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	891	451	267	534	5
Volume Left	0	0	0	0	5
Volume Right	0	5	0	0	0
cSH	1700	1700	566	1700	113
Volume to Capacity	0.52	0.27	0.00	0.31	0.04
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.0
Control Delay (s)	0.0	0.0	0.0	0.0	38.4
Lane LOS	E				
Approach Delay (s)	0.0		0.0		38.4
Approach LOS	E				

Intersection Summary

Average Delay	0.1					
Intersection Capacity Utilization	46.4%			ICU Level of Service		A
Analysis Period (min)	15					

Lanes, Volumes, Timings

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/28/2024

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	5	0	0	5	0
Future Volume (vph)	0	5	0	0	5	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected						0.950
Satd. Flow (prot)	1644	0	1900	0	0	1805
Flt Permitted						0.950
Satd. Flow (perm)	1644	0	1900	0	0	1805
Link Speed (k/h)	20					
Link Distance (m)	35.0		49.5		44.5	
Travel Time (s)	6.3		8.9		8.0	
Confl. Peds. (#/hr)	8					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%					
Adj. Flow (vph)	0	6	0	0	6	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	0	0	0	0	6
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6					
Link Offset(m)	0.0					
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	14		24	
Sign Control	Stop		Free		Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	15.7% ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/28/2024

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	5	0	0	5	0
Future Volume (Veh/h)	0	5	0	0	5	0
Sign Control	Stop		Free		Free	
Grade	0%					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	6	0	0	6	0
Pedestrians	2					
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0					1
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	14	8	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	14	8	0			
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	1005	1072			1636	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	6	0	6
Volume Left	0	0	6
Volume Right	6	0	0
cSH	1072	1700	1636
Volume to Capacity	0.01	0.00	0.00
Queue Length 95th (m)	0.1	0.0	0.1
Control Delay (s)	8.4	0.0	7.2
Lane LOS	A		A
Approach Delay (s)	8.4	0.0	7.2
Approach LOS	A		

Intersection Summary			
Average Delay	7.8		
Intersection Capacity Utilization	15.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings

11: PUDO + Parking & Speers Internal Road

02/28/2024



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	5	0	0	5	0	5
Future Volume (vph)	5	0	0	5	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected						
Satd. Flow (prot)	1900	0	0	1900	1644	0
Flt Permitted						
Satd. Flow (perm)	1900	0	0	1900	1644	0
Link Speed (k/h)	20		20		20	
Link Distance (m)	35.0		37.7		75.1	
Travel Time (s)	6.3		6.8		13.5	
Confl. Peds. (#/hr)			13			
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	6	0	0	6	0	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	0	0	6	6	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0		0.0		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	14		24		24	
Sign Control	Free		Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	13.3%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

11: PUDO + Parking & Speers Internal Road

02/28/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	5	0	0	5	0	5
Future Volume (Veh/h)	5	0	0	5	0	5
Sign Control	Free			Free	Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	6	0	0	6	0	6
Pedestrians	13		2			
Lane Width (m)	3.6		3.6			
Walking Speed (m/s)	1.1		1.1			
Percent Blockage	1		0			
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			6		25 8	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			6		25 8	
tC, single (s)			4.1		6.4 6.2	
tC, 2 stage (s)						
tF (s)			2.2		3.5 3.3	
p0 queue free %			100		100 99	
cM capacity (veh/h)			1628		984 1078	

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	6	6	6
Volume Left	0	0	0
Volume Right	0	0	6
cSH	1700	1628	1078
Volume to Capacity	0.00	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.1
Control Delay (s)	0.0	0.0	8.4
Lane LOS	A		
Approach Delay (s)	0.0	0.0	8.4
Approach LOS	A		

Intersection Summary

Average Delay	2.8		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings

12: Underground & Speers Internal Road

02/28/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (vph)	10	0	0	0	5	5
Future Volume (vph)	10	0	0	0	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt					0.932	
Flt Protected					0.976	
Satd. Flow (prot)	1900	0	0	1900	1728	0
Flt Permitted					0.976	
Satd. Flow (perm)	1900	0	0	1900	1728	0
Link Speed (k/h)	20			20	20	
Link Distance (m)	37.7			38.9	38.9	
Travel Time (s)	6.8			7.0	7.0	
Confl. Peds. (#/hr)					10	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	13	0	0	0	6	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	0	0	0	12	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	13.3%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

12: Underground & Speers Internal Road

02/28/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (veh/h)	10	0	0	0	5	5
Future Volume (Veh/h)	10	0	0	0	5	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	13	0	0	0	6	6
Pedestrians	10			3		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	1			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			13		23	16
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			13		23	16
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1619		989	1066

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	13	0	12
Volume Left	0	0	6
Volume Right	0	0	6
cSH	1700	1700	1026
Volume to Capacity	0.01	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.3
Control Delay (s)	0.0	0.0	8.5
Lane LOS	A		
Approach Delay (s)	0.0	0.0	8.5
Approach LOS	A		

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings

13: PUDO Exit/Speers Internal Road 2 & Speers Internal Road/30 Speers

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↔	
Traffic Volume (vph)	15	0	0	0	0	20	0	5	0	5	0	0
Future Volume (vph)	15	0	0	0	0	20	0	5	0	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.865											
Frt	0.950											
Fit Protected	0.950											
Satd. Flow (prot)	0	1504	0	0	1644	0	0	1900	0	0	1805	0
Fit Permitted	0.950											
Satd. Flow (perm)	0	1504	0	0	1644	0	0	1900	0	0	1805	0
Link Speed (k/h)	20											
Link Distance (m)	38.9			43.4			75.5			49.2		
Travel Time (s)	7.0			7.8			13.6			8.9		
Confl. Peds. (#/hr)	2		8	8		2		7	7			
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Heavy Vehicles (%)	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%
Adj. Flow (vph)	24	0	0	0	0	32	0	8	0	8	0	0
Shared Lane Traffic (%)	0											
Lane Group Flow (vph)	0	24	0	0	32	0	0	8	0	0	8	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0											
Link Offset(m)	0.0											
Crosswalk Width(m)	1.6			1.6			1.6			1.6		
Two way Left Turn Lane	No											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control	Stop		Stop		Free		Free		Free		Free	

Intersection Summary

Area Type: Other
 Control Type: Unsignalized
 Intersection Capacity Utilization 20.9% ICU Level of Service A
 Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis

13: PUDO Exit/Speers Internal Road 2 & Speers Internal Road/30 Speers

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↔	
Traffic Volume (veh/h)	15	0	0	0	0	20	0	5	0	5	0	0
Future Volume (Veh/h)	15	0	0	0	0	20	0	5	0	5	0	0
Sign Control	Stop		Stop		Free		Free		Free		Free	
Grade	0%											
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Hourly flow rate (vph)	24	0	0	0	0	32	0	8	0	8	0	0
Pedestrians	3											
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	0											
Right turn flare (veh)	0											
Median type	None						None					
Median storage (veh)	0											
Upstream signal (m)	0											
pX, platoon unblocked	0											
vC, conflicting volume	62	34	11	39	34	18	3			15		
vC1, stage 1 conf vol	0											
vC2, stage 2 conf vol	0											
vCu, unblocked vol	62	34	11	39	34	18	3			15		
tC, single (s)	7.3	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	0											
tF (s)	3.7	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	100	100	100	97	100			100		
cM capacity (veh/h)	849	850	1065	947	850	1057	1628			1606		

Direction, Lane #

	EB 1	WB 1	NB 1	SB 1
Volume Total	24	32	8	8
Volume Left	24	0	0	8
Volume Right	0	32	0	0
cSH	849	1057	1628	1606
Volume to Capacity	0.03	0.03	0.00	0.00
Queue Length 95th (m)	0.7	0.7	0.0	0.1
Control Delay (s)	9.4	8.5	0.0	7.3
Lane LOS	A	A		A
Approach Delay (s)	9.4	8.5	0.0	7.3
Approach LOS	A	A		

Intersection Summary

Average Delay 7.7
 Intersection Capacity Utilization 20.9% ICU Level of Service A
 Analysis Period (min) 15

Lanes, Volumes, Timings

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (vph)	0	1310	0	5	775	0	10	0	30	0	0	0
Future Volume (vph)	0	1310	0	5	775	0	10	0	30	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.900											
Flt Protected	0.987											
Satd. Flow (prot)	0	3539	0	0	3540	0	0	1688	0	0	1863	0
Flt Permitted	0.987											
Satd. Flow (perm)	0	3539	0	0	3540	0	0	1688	0	0	1863	0
Link Speed (k/h)	60											
Link Distance (m)	113.4			233.1			49.2			39.0		
Travel Time (s)	6.8			14.0			8.9			7.0		
Confl. Peds. (#/hr)	8			8								
Confl. Bikes (#/hr)	1											
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	2%	0%	2%	2%	2%
Adj. Flow (vph)	0	1379	0	5	816	0	11	0	32	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1379	0	0	821	0	0	43	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.6			3.6			0.0					
Link Offset(m)	0.0											
Crosswalk Width(m)	1.6			1.6			1.6					
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14		24		14		24		14	
Sign Control	Free			Free			Stop			Stop		

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	46.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (veh/h)	0	1310	0	5	775	0	10	0	30	0	0	0
Future Volume (Veh/h)	0	1310	0	5	775	0	10	0	30	0	0	0
Sign Control	Free			Free			Stop			Stop		
Grade	0%											
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Hourly flow rate (vph)	0	1379	0	5	816	0	11	0	32	0	0	0
Pedestrians	4											
Lane Width (m)	3.6			3.6			3.6					
Walking Speed (m/s)	1.1			1.1			1.1					
Percent Blockage	0											
Right turn flare (veh)	1											
Median type	None											
Median storage (veh)												
Upstream signal (m)	261			233								
pX, platoon unblocked	0.96			0.87			0.89			0.89		
vC, conflicting volume	816			1387			1809			2213		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	717			1145			1444			1898		
tC, single (s)	4.1			4.1			7.5			6.5		
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5			4.0		
p0 queue free %	100			99			87			100		
cM capacity (veh/h)	842			533			82			60		
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	919	460	277	544	43	0						
Volume Left	0	0	5	0	11	0						
Volume Right	0	0	0	0	32	0						
cSH	1700	1700	533	1700	225	1700						
Volume to Capacity	0.54	0.27	0.01	0.32	0.19	0.00						
Queue Length 95th (m)	0.0	0.0	0.2	0.0	5.2	0.0						
Control Delay (s)	0.0	0.0	0.3	0.0	24.8	0.0						
Lane LOS	A			C			A			A		
Approach Delay (s)	0.0			0.1			24.8			0.0		
Approach LOS	C			A								
Intersection Summary												
Average Delay	0.5											
Intersection Capacity Utilization	46.2%			ICU Level of Service			A					
Analysis Period (min)	15											

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

02/28/2024

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖		↖	↖	↖		↖	↖	↖	↖	↖
Traffic Volume (vph)	60	525	120	285	750	490	140	140	220	270	235	60
Future Volume (vph)	60	525	120	285	750	490	140	140	220	270	235	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	105.0		0.0	75.0		100.0	50.0		45.0	0.0		0.0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99		1.00		0.94	0.97		0.93	0.96	0.99	
Frt		0.972				0.850			0.850		0.970	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3431	0	1752	3539	1583	1787	1900	1599	1787	1816	0
Flt Permitted	0.319			0.292			0.362			0.510		
Satd. Flow (perm)	600	3431	0	536	3539	1485	659	1900	1486	918	1816	0
Right Turn on Red			Yes			Yes		Yes				Yes
Satd. Flow (RTOR)		27				516			232		11	
Link Speed (kh)		60			60			50			50	
Link Distance (m)		235.8			147.2			127.4			167.2	
Travel Time (s)		14.1			8.8			9.2			12.0	
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	3%	2%	1%	0%	1%	1%	1%	0%	0%
Adj. Flow (vph)	63	553	126	300	789	516	147	147	232	284	247	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	63	679	0	300	789	516	147	147	232	284	310	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

02/28/2024

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2		2	4		4	8		
Detector Phase	1	6		5	2	2	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	7.0	25.0		7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0	
Minimum Split (s)	10.0	30.9		10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3	
Total Split (s)	12.0	54.0		12.0	54.0	54.0	12.0	38.0	38.0	16.0	42.0	
Total Split (%)	10.0%	45.0%		10.0%	45.0%	45.0%	10.0%	31.7%	31.7%	13.3%	35.0%	
Maximum Green (s)	9.0	48.1		9.0	48.1	48.1	9.0	31.7	31.7	13.0	35.7	
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	
All-Red Time (s)	0.0	2.2		0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	5.5		2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	
Walk Time (s)		7.0			7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		14.0			14.0	14.0		14.0	14.0		14.0	
Pedestrian Calls (#/hr)		15			15	15		35	35		35	
Act Effect Green (s)	62.0	51.6		70.8	59.6	59.6	34.5	20.9	20.9	43.0	26.4	
Actuated g/C Ratio	0.52	0.43		0.59	0.50	0.50	0.29	0.17	0.17	0.36	0.22	
v/c Ratio	0.16	0.46		0.66	0.45	0.52	0.51	0.45	0.52	0.64	0.76	
Control Delay	13.5	25.6		22.6	22.4	3.9	32.9	47.1	9.1	35.9	54.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	13.5	25.6		22.6	22.4	3.9	32.9	47.1	9.1	35.9	54.0	
LOS	B	C		C	C	A	C	D	A	D	D	
Approach Delay		24.6			16.5			26.4			45.4	
Approach LOS		C			B			C			D	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 49 (41%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 24.7

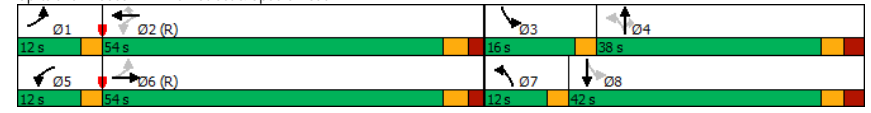
Intersection LOS: C

Intersection Capacity Utilization 83.1%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 1: Kerr Street & Speers Road



Timings
1: Kerr Street & Speers Road

02/28/2024

	↖	→	↙	←	↘	↖	↙	↘	↖	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	60	525	285	750	490	140	140	220	270	235
Future Volume (vph)	60	525	285	750	490	140	140	220	270	235
Turn Type	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	1	6	5	2		7	4		3	8
Permitted Phases	6		2		2	4		4	8	
Detector Phase	1	6	5	2	2	7	4	4	3	8
Switch Phase										
Minimum Initial (s)	7.0	25.0	7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0
Minimum Split (s)	10.0	30.9	10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3
Total Split (s)	12.0	54.0	12.0	54.0	54.0	12.0	38.0	38.0	16.0	42.0
Total Split (%)	10.0%	45.0%	10.0%	45.0%	45.0%	10.0%	31.7%	31.7%	13.3%	35.0%
Yellow Time (s)	3.0	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3
All-Red Time (s)	0.0	2.2	0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	None	C-Min	C-Min	None	None	None	None	None
Act Effect Green (s)	62.0	51.6	70.8	59.6	59.6	34.5	20.9	20.9	43.0	26.4
Actuated g/C Ratio	0.52	0.43	0.59	0.50	0.50	0.29	0.17	0.17	0.36	0.22
v/c Ratio	0.16	0.46	0.66	0.45	0.52	0.51	0.45	0.52	0.64	0.76
Control Delay	13.5	25.6	22.6	22.4	3.9	32.9	47.1	9.1	35.9	54.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	25.6	22.6	22.4	3.9	32.9	47.1	9.1	35.9	54.0
LOS	B	C	C	C	A	C	D	A	D	D
Approach Delay		24.6		16.5			26.4			45.4
Approach LOS		C		B			C			D

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 49 (41%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.76
 Intersection Signal Delay: 24.7 Intersection LOS: C
 Intersection Capacity Utilization 83.1% ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 1: Kerr Street & Speers Road



Queues
1: Kerr Street & Speers Road

02/28/2024

	↖	→	↙	←	↘	↖	↙	↘	↖	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	63	679	300	789	516	147	147	232	284	310
v/c Ratio	0.16	0.46	0.66	0.45	0.52	0.51	0.45	0.52	0.64	0.76
Control Delay	13.5	25.6	22.6	22.4	3.9	32.9	47.1	9.1	35.9	54.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	25.6	22.6	22.4	3.9	32.9	47.1	9.1	35.9	54.0
Queue Length 50th (m)	6.4	62.0	35.3	66.5	0.0	23.0	31.3	0.0	48.4	65.2
Queue Length 95th (m)	13.6	76.4	#59.6	90.5	20.4	36.2	46.5	19.2	68.8	90.5
Internal Link Dist (m)		211.8		123.2		103.4			143.2	
Turn Bay Length (m)	105.0		75.0		100.0	50.0		45.0		
Base Capacity (vph)	407	1526	453	1758	997	288	501	563	443	547
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.44	0.66	0.45	0.52	0.51	0.29	0.41	0.64	0.57

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Kerr Street & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	60	525	120	285	750	490	140	140	220	270	235	60
Future Volume (vph)	60	525	120	285	750	490	140	140	220	270	235	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frb, ped/bikes	1.00	0.99		1.00	1.00	0.94	1.00	1.00	0.93	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	0.98	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1797	3431		1751	3539	1485	1768	1900	1486	1750	1816	
Flt Permitted	0.32	1.00		0.29	1.00	1.00	0.36	1.00	1.00	0.51	1.00	
Satd. Flow (perm)	603	3431		539	3539	1485	674	1900	1486	940	1816	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	553	126	300	789	516	147	147	232	284	247	63
RTOR Reduction (vph)	0	15	0	0	0	262	0	0	192	0	9	0
Lane Group Flow (vph)	63	664	0	300	789	254	147	147	40	284	301	0
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2			4			4	8	
Actuated Green, G (s)	57.7	51.6		68.1	59.0	59.0	31.2	20.9	20.9	39.7	26.4	
Effective Green, g (s)	57.7	51.6		68.1	59.0	59.0	31.2	20.9	20.9	39.7	26.4	
Actuated g/C Ratio	0.48	0.43		0.57	0.49	0.49	0.26	0.17	0.17	0.33	0.22	
Clearance Time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Vehicle Extension (s)	2.5	5.5		2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	
Lane Grp Cap (vph)	350	1475		442	1740	730	269	330	258	417	399	
v/s Ratio Prot	0.01	0.19		c0.08	0.22		0.05	0.08		c0.09	c0.17	
v/s Ratio Perm	0.08			c0.31			0.17	0.10		0.03	0.14	
v/c Ratio	0.18	0.45		0.68	0.45	0.35	0.55	0.45	0.16	0.68	0.76	
Uniform Delay, d1	16.9	24.2		14.9	20.0	18.7	36.1	44.4	42.1	32.2	43.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	1.0		3.7	0.9	1.3	1.8	1.3	0.4	4.2	8.4	
Delay (s)	17.1	25.2		18.7	20.8	20.0	37.9	45.7	42.5	36.4	52.2	
Level of Service	B	C		B	C	C	D	D	D	D	D	
Approach Delay (s)		24.5			20.2			42.1			44.6	
Approach LOS		C			C			D			D	

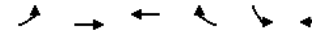
Intersection Summary			
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

2: Speers Road & Cross Avenue

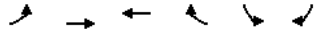
02/28/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	225	775	1140	15	10	385
Future Volume (vph)	225	775	1140	15	10	385
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	80.0			0.0	45.0	0.0
Storage Lanes	1			0	1	2
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	0.88
Ped Bike Factor	1.00		1.00			
Frt			0.998			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1703	3610	3566	0	1805	2733
Flt Permitted	0.183				0.950	
Satd. Flow (perm)	328	3610	3566	0	1805	2733
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			2			333
Link Speed (k/h)		60	60		48	
Link Distance (m)		233.1	101.5		84.0	
Travel Time (s)		14.0	6.1		6.3	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Adj. Flow (vph)	234	807	1188	16	10	401
Shared Lane Traffic (%)						
Lane Group Flow (vph)	234	807	1204	0	10	401
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
2: Speers Road & Cross Avenue

02/28/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	pm+pt	NA	NA	Prot	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Detector Phase	5	2	6		4	4
Switch Phase						
Minimum Initial (s)	6.0	38.0	38.0		10.0	10.0
Minimum Split (s)	12.0	47.6	47.6		15.8	15.8
Total Split (s)	17.0	102.0	85.0		38.0	38.0
Total Split (%)	12.1%	72.9%	60.7%		27.1%	27.1%
Maximum Green (s)	11.0	95.4	78.4		32.2	32.2
Yellow Time (s)	4.0	3.7	3.7		3.3	3.3
All-Red Time (s)	2.0	2.9	2.9		2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6		5.8	5.8
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Recall Mode	None	C-Min	C-Min		None	None
Walk Time (s)		10.0	10.0			
Flash Dont Walk (s)		31.0	31.0			
Pedestrian Calls (#/hr)		5	5			
Act Effect Green (s)	116.3	115.7	97.6		11.9	11.9
Actuated g/C Ratio	0.83	0.83	0.70		0.08	0.08
v/c Ratio	0.60	0.27	0.48		0.07	0.75
Control Delay	9.4	3.1	11.2		58.0	21.2
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	9.4	3.1	11.2		58.0	21.2
LOS	A	A	B		E	C
Approach Delay		4.5	11.2		22.1	
Approach LOS		A	B		C	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 13 (9%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.75
 Intersection Signal Delay: 10.3 Intersection LOS: B
 Intersection Capacity Utilization 70.3% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: Speers Road & Cross Avenue



Timings
2: Speers Road & Cross Avenue

02/28/2024

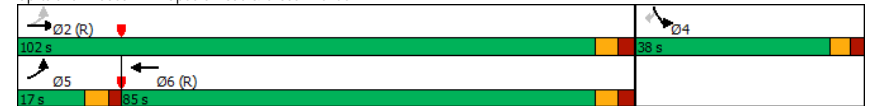


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↕↕	↕↕	↔	↕↕
Traffic Volume (vph)	225	775	1140	10	385
Future Volume (vph)	225	775	1140	10	385
Turn Type	pm+pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2				4
Detector Phase	5	2	6	4	4
Switch Phase					
Minimum Initial (s)	6.0	38.0	38.0	10.0	10.0
Minimum Split (s)	12.0	47.6	47.6	15.8	15.8
Total Split (s)	17.0	102.0	85.0	38.0	38.0
Total Split (%)	12.1%	72.9%	60.7%	27.1%	27.1%
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	None	None
Act Effect Green (s)	116.3	115.7	97.6	11.9	11.9
Actuated g/C Ratio	0.83	0.83	0.70	0.08	0.08
v/c Ratio	0.60	0.27	0.48	0.07	0.75
Control Delay	9.4	3.1	11.2	58.0	21.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.4	3.1	11.2	58.0	21.2
LOS	A	A	B	E	C
Approach Delay		4.5	11.2	22.1	
Approach LOS		A	B	C	

Intersection Summary

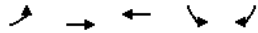
Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 13 (9%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.75
 Intersection Signal Delay: 10.3 Intersection LOS: B
 Intersection Capacity Utilization 70.3% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: Speers Road & Cross Avenue



Queues
2: Speers Road & Cross Avenue

02/28/2024

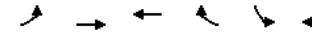


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	234	807	1204	10	401
w/c Ratio	0.60	0.27	0.48	0.07	0.75
Control Delay	9.4	3.1	11.2	58.0	21.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.4	3.1	11.2	58.0	21.2
Queue Length 50th (m)	9.1	18.9	66.3	2.7	10.3
Queue Length 95th (m)	19.5	33.0	113.8	8.1	27.7
Internal Link Dist (m)		209.1	77.5	60.0	
Turn Bay Length (m)	80.0		45.0		
Base Capacity (vph)	398	2983	2486	415	885
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.59	0.27	0.48	0.02	0.45

Intersection Summary

HCM Signalized Intersection Capacity Analysis
2: Speers Road & Cross Avenue

02/28/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕↕	↕↕		↔	↕↕
Traffic Volume (vph)	225	775	1140	15	10	385
Future Volume (vph)	225	775	1140	15	10	385
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.6	6.6		5.8	5.8
Lane Util. Factor	1.00	0.95	0.95		1.00	0.88
Frbp, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1703	3610	3566		1805	2733
Flt Permitted	0.18	1.00	1.00		0.95	1.00
Satd. Flow (perm)	328	3610	3566		1805	2733
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	234	807	1188	16	10	401
RTOR Reduction (vph)	0	0	1	0	0	305
Lane Group Flow (vph)	234	807	1203	0	10	96
Confl. Peds. (#/hr)	5			5		
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	115.7	115.7	97.6		11.9	11.9
Effective Green, g (s)	115.7	115.7	97.6		11.9	11.9
Actuated g/C Ratio	0.83	0.83	0.70		0.09	0.09
Clearance Time (s)	6.0	6.6	6.6		5.8	5.8
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Lane Grp Cap (vph)	389	2983	2486		153	232
v/s Ratio Prot	c0.05	0.22	0.34		0.01	
v/s Ratio Perm	c0.44					c0.04
w/c Ratio	0.60	0.27	0.48		0.07	0.42
Uniform Delay, d1	6.5	2.7	9.7		58.9	60.7
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.8	0.2	0.7		0.2	1.2
Delay (s)	9.3	2.9	10.4		59.1	62.0
Level of Service	A	A	B		E	E
Approach Delay (s)		4.4	10.4		61.9	
Approach LOS		A	B		E	

Intersection Summary

HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

3: St. Augustine Drive & Speers Road

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕			↕				↕		↕	
Traffic Volume (vph)	10	675	25	0	925	25	5	0	25	5	0	0
Future Volume (vph)	10	675	25	0	925	25	5	0	25	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		1	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995			0.996				0.865			
Flt Protected	0.950						0.950				0.950	
Satd. Flow (prot)	1805	3553	0	0	3561	0	0	0	1644	0	1805	0
Flt Permitted	0.950						0.950				0.950	
Satd. Flow (perm)	1805	3553	0	0	3561	0	0	0	1644	0	1805	0
Link Speed (k/h)		60			60				40			30
Link Distance (m)		248.1			235.8				188.1			117.6
Travel Time (s)		14.9			14.1				16.9			14.1
Confl. Peds. (#/hr)	8		5	5		8	1		1	1		1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	10	703	26	0	964	26	5	0	26	5	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	729	0	0	990	0	0	5	26	0	5	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6				0.0			0.0
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		1.6			1.6				1.6			1.6
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free				Stop			Stop

Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization Err%	ICU Level of Service H											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

3: St. Augustine Drive & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations	↔	↕			↕				↕		↕			
Traffic Volume (veh/h)	10	675	25	0	925	25	5	0	25	5	0	0		
Future Volume (Veh/h)	10	675	25	0	925	25	5	0	25	5	0	0		
Sign Control	Free			Free			Stop			Stop				
Grade	0%			0%			0%			0%				
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96		
Hourly flow rate (vph)	10	703	26	0	964	26	5	0	26	5	0	0		
Pedestrians	1			1			5			8				
Lane Width (m)	3.6			3.6			3.6			3.6				
Walking Speed (m/s)	1.1			1.1			1.1			1.1				
Percent Blockage	0			0			0			1				
Right turn flare (veh)														
Median type	None			None										
Median storage (veh)														
Upstream signal (m)	236													
pX, platoon unblocked	0.86						0.86	0.86						
vC, conflicting volume	998	734							1224	1739	370	1384	1739	504
vC1, stage 1 conf vol														
vC2, stage 2 conf vol														
vCu, unblocked vol	662	734							926	1527	370	1112	1527	85
tC, single (s)	4.1	4.1							7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)														
tF (s)	2.2	2.2							3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99	100							97	100	96	96	100	100
cM capacity (veh/h)	796	876							190	99	629	133	99	819

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1	
Volume Total	10	469	260	643	347	31	5	
Volume Left	10	0	0	0	0	5	5	
Volume Right	0	0	26	0	26	26	0	
cSH	796	1700	1700	1700	1700	458	133	
Volume to Capacity	0.01	0.28	0.15	0.38	0.20	0.07	0.04	
Queue Length 95th (m)	0.3	0.0	0.0	0.0	0.0	1.6	0.9	
Control Delay (s)	9.6	0.0	0.0	0.0	0.0	13.4	33.2	
Lane LOS	A						B	D
Approach Delay (s)	0.1	0.0					13.4	33.2
Approach LOS							B	D

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

02/28/2024

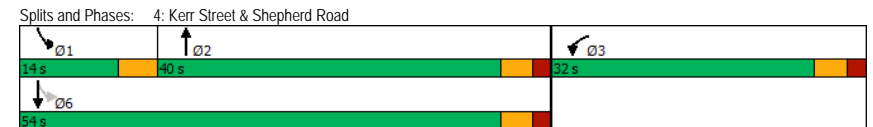
	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙		↖			↘
Traffic Volume (vph)	90	140	575	115	155	475
Future Volume (vph)	90	140	575	115	155	475
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor	0.98		1.00			1.00
Frt	0.918		0.975			
Flt Protected	0.981					0.988
Satd. Flow (prot)	1663	0	3463	0	0	3540
Flt Permitted	0.981					0.660
Satd. Flow (perm)	1654	0	3463	0	0	2364
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	94		33			
Link Speed (kh)	50		50			50
Link Distance (m)	265.3		167.2			26.5
Travel Time (s)	19.1		12.0			1.9
Confl. Peds. (#/hr)	13	6		4	4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	1%	1%	2%	0%	1%
Adj. Flow (vph)	93	144	593	119	160	490
Shared Lane Traffic (%)						
Lane Group Flow (vph)	237	0	712	0	0	650
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1		2		1	2
Detector Template	Left		Thru		Left	Thru
Leading Detector (m)	2.0		10.0		2.0	10.0
Trailing Detector (m)	0.0		0.0		0.0	0.0
Detector 1 Position(m)	0.0		0.0		0.0	0.0
Detector 1 Size(m)	2.0		0.6		2.0	0.6
Detector 1 Type	CI+Ex		CI+Ex		CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0		0.0	0.0
Detector 1 Queue (s)	0.0		0.0		0.0	0.0
Detector 1 Delay (s)	0.0		0.0		0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			CI+Ex			CI+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases						6

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

02/28/2024

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	3		2		1	6
Switch Phase						
Minimum Initial (s)	10.0		18.0		7.0	18.0
Minimum Split (s)	31.4		28.2		11.0	28.2
Total Split (s)	32.0		40.0		14.0	54.0
Total Split (%)	37.2%		46.5%		16.3%	62.8%
Maximum Green (s)	26.6		34.8		10.0	48.8
Yellow Time (s)	3.3		3.3		4.0	3.3
All-Red Time (s)	2.1		1.9		0.0	1.9
Lost Time Adjust (s)	0.0		0.0			0.0
Total Lost Time (s)	5.4		5.2			5.2
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.5		2.5	3.5
Recall Mode	None		Min		None	Min
Walk Time (s)	10.0		10.0			10.0
Flash Dont Walk (s)	16.0		13.0			13.0
Pedestrian Calls (#/hr)	0		5			5
Act Effect Green (s)	11.4		21.3			21.3
Actuated g/C Ratio	0.26		0.49			0.49
v/c Ratio	0.47		0.42			0.56
Control Delay	12.7		7.6			10.1
Queue Delay	0.0		0.0			0.0
Total Delay	12.7		7.6			10.1
LOS	B		A			B
Approach Delay	12.7		7.6			10.1
Approach LOS	B		A			B

Intersection Summary	
Area Type:	Other
Cycle Length:	86
Actuated Cycle Length:	43.5
Natural Cycle:	75
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.56
Intersection Signal Delay:	9.4
Intersection Capacity Utilization:	65.8%
Intersection LOS:	A
ICU Level of Service:	C
Analysis Period (min):	15



Timings
4: Kerr Street & Shepherd Road

02/28/2024

	↙	↑	↘	↓
Lane Group	WBL	NBT	SBL	SBT
Lane Configurations	↔	↕	↔	↕
Traffic Volume (vph)	90	575	155	475
Future Volume (vph)	90	575	155	475
Turn Type	Prot	NA	pm+pt	NA
Protected Phases	3	2	1	6
Permitted Phases	6			
Detector Phase	3	2	1	6
Switch Phase				
Minimum Initial (s)	10.0	18.0	7.0	18.0
Minimum Split (s)	31.4	28.2	11.0	28.2
Total Split (s)	32.0	40.0	14.0	54.0
Total Split (%)	37.2%	46.5%	16.3%	62.8%
Yellow Time (s)	3.3	3.3	4.0	3.3
All-Red Time (s)	2.1	1.9	0.0	1.9
Lost Time Adjust (s)	0.0	0.0		0.0
Total Lost Time (s)	5.4	5.2		5.2
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	None	Min	None	Min
Act Effct Green (s)	11.4	21.3		21.3
Actuated g/C Ratio	0.26	0.49		0.49
v/c Ratio	0.47	0.42		0.56
Control Delay	12.7	7.6		10.1
Queue Delay	0.0	0.0		0.0
Total Delay	12.7	7.6		10.1
LOS	B	A		B
Approach Delay	12.7	7.6		10.1
Approach LOS	B	A		B

Intersection Summary

Cycle Length: 86	
Actuated Cycle Length: 43.5	
Natural Cycle: 75	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 9.4	Intersection LOS: A
Intersection Capacity Utilization 65.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 4: Kerr Street & Shepherd Road



Queues
4: Kerr Street & Shepherd Road

02/28/2024

	↙	↑	↓
Lane Group	WBL	NBT	SBT
Lane Group Flow (vph)	237	712	650
v/c Ratio	0.47	0.42	0.56
Control Delay	12.7	7.6	10.1
Queue Delay	0.0	0.0	0.0
Total Delay	12.7	7.6	10.1
Queue Length 50th (m)	7.6	13.6	14.6
Queue Length 95th (m)	27.7	28.5	32.1
Internal Link Dist (m)	241.3	143.2	2.5
Turn Bay Length (m)			
Base Capacity (vph)	1076	2841	2296
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.22	0.25	0.28

Intersection Summary

--

HCM Signalized Intersection Capacity Analysis

4: Kerr Street & Shepherd Road

02/28/2024



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↕	↕	↔	↔
Traffic Volume (vph)	90	140	575	115	155	475
Future Volume (vph)	90	140	575	115	155	475
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4		5.2			5.2
Lane Util. Factor	1.00		0.95			0.95
Frb, ped/bikes	0.99		1.00			1.00
Flpb, ped/bikes	1.00		1.00			1.00
Frt	0.92		0.97			1.00
Flt Protected	0.98		1.00			0.99
Satd. Flow (prot)	1665		3465			3538
Flt Permitted	0.98		1.00			0.66
Satd. Flow (perm)	1665		3465			2364
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	93	144	593	119	160	490
RTOR Reduction (vph)	69	0	17	0	0	0
Lane Group Flow (vph)	168	0	695	0	0	650
Confl. Peds. (#/hr)	13	6		4	4	
Heavy Vehicles (%)	3%	1%	1%	2%	0%	1%
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases					6	
Actuated Green, G (s)	11.4		21.2			21.2
Effective Green, g (s)	11.4		21.2			21.2
Actuated g/C Ratio	0.26		0.49			0.49
Clearance Time (s)	5.4		5.2			5.2
Vehicle Extension (s)	3.0		3.5			3.5
Lane Grp Cap (vph)	439		1700			1160
v/s Ratio Prot	c0.10		0.20			
v/s Ratio Perm						c0.27
v/c Ratio	0.38		0.41			0.56
Uniform Delay, d1	13.0		7.0			7.7
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	0.6		0.2			0.7
Delay (s)	13.6		7.2			8.4
Level of Service	B		A			A
Approach Delay (s)	13.6		7.2			8.4
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	43.2	Sum of lost time (s)	14.6
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

5: Kerr Street & Wycroft Road

02/28/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↕	↕	↕	↕
Traffic Volume (vph)	25	120	100	615	510	110
Future Volume (vph)	25	120	100	615	510	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	75.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.889				0.976	
Flt Protected	0.991		0.950			
Satd. Flow (prot)	1620	0	1703	1900	1841	0
Flt Permitted	0.991		0.950			
Satd. Flow (perm)	1620	0	1703	1900	1841	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	561.6			442.6	98.1	
Travel Time (s)	40.4			31.9	7.1	
Confl. Peds. (#/hr)			5			5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	4%	6%	0%	0%	4%
Adj. Flow (vph)	27	128	106	654	543	117
Shared Lane Traffic (%)						
Lane Group Flow (vph)	155	0	106	654	660	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	57.9%
ICU Level of Service	B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

5: Kerr Street & Wynecroft Road

02/28/2024

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	120	100	615	510	110
Future Volume (Veh/h)	25	120	100	615	510	110
Sign Control	Stop		Free			
Grade	0%		0%			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	27	128	106	654	543	117
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1472	606	665			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1472	606	665			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	78	74	88			
cM capacity (veh/h)	124	491	901			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	155	106	654	660		
Volume Left	27	106	0	0		
Volume Right	128	0	0	117		
cSH	324	901	1700	1700		
Volume to Capacity	0.48	0.12	0.38	0.39		
Queue Length 95th (m)	18.7	3.0	0.0	0.0		
Control Delay (s)	25.9	9.5	0.0	0.0		
Lane LOS	D	A				
Approach Delay (s)	25.9	1.3		0.0		
Approach LOS	D					
Intersection Summary						
Average Delay			3.2			
Intersection Capacity Utilization			57.9%	ICU Level of Service	B	
Analysis Period (min)			15			

Lanes, Volumes, Timings

6: Kerr Street & Prince Charles Drive

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	10	0	10	10	0	30	5	460	10	20	595	25	
Future Volume (vph)	10	0	10	10	0	30	5	460	10	20	595	25	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt	0.932			0.900			0.997			0.995			
Flt Protected	0.976			0.987						0.998			
Satd. Flow (prot)	0	1728	0	0	1688	0	0	1872	0	0	1847	0	
Flt Permitted	0.976			0.987						0.998			
Satd. Flow (perm)	0	1728	0	0	1688	0	0	1872	0	0	1847	0	
Link Speed (k/h)	40			40			50			50			
Link Distance (m)	57.8			56.0			134.8			127.4			
Travel Time (s)	5.2			5.0			9.7			9.2			
Confl. Peds. (#/hr)	4		1	1		4	21		31	31		21	
Confl. Bikes (#/hr)									1				
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Heavy Vehicles (%)	0%	50%	0%	0%	0%	0%	20%	1%	0%	5%	2%	4%	
Adj. Flow (vph)	11	0	11	11	0	32	5	484	11	21	626	26	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	22	0	0	43	0	0	500	0	0	673	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)	0.0			0.0			0.0			3.6			
Link Offset(m)	0.0			0.0			0.0			0.0			
Crosswalk Width(m)	1.6			1.6			1.6			1.6			
Two way Left Turn Lane													
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (k/h)	24		14	24		14	24		14	24		14	
Sign Control	Stop				Stop		Free				Free		
Intersection Summary													
Area Type:	Other												
Control Type:	Unsignalized												
Intersection Capacity Utilization	56.6%						ICU Level of Service B						
Analysis Period (min)	15												

HCM Unsignalized Intersection Capacity Analysis

6: Kerr Street & Prince Charles Drive

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	10	0	10	10	0	30	5	460	10	20	595	25
Future Volume (Veh/h)	10	0	10	10	0	30	5	460	10	20	595	25
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	0	11	11	0	32	5	484	11	21	626	26
Pedestrians	21			31			1			4		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	2			3			0			0		
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (m)							238			127		
pX, platoon unblocked	0.77	0.77	0.76	0.77	0.77	0.96	0.76				0.96	
vC, conflicting volume	1238	1238	661	1224	1246	524	673				526	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1054	1055	391	1036	1065	487	407				489	
tC, single (s)	7.1	7.0	6.2	7.1	6.5	6.2	4.3				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.5	3.3	3.5	4.0	3.3	2.4				2.2	
p0 queue free %	92	100	98	93	100	94	99				98	
cM capacity (veh/h)	138	134	491	147	161	545	787				991	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	22	43	500	673								
Volume Left	11	11	5	21								
Volume Right	11	32	11	26								
cSH	216	322	787	991								
Volume to Capacity	0.10	0.13	0.01	0.02								
Queue Length 95th (m)	2.6	3.5	0.1	0.5								
Control Delay (s)	23.6	17.9	0.2	0.6								
Lane LOS	C	C	A	A								
Approach Delay (s)	23.6	17.9	0.2	0.6								
Approach LOS	C	C										
Intersection Summary												
Average Delay	1.4											
Intersection Capacity Utilization	56.6%			ICU Level of Service			B					
Analysis Period (min)	15											

Lanes, Volumes, Timings

7: Kerr Street & Elmwood Road

02/28/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	15	10	5	460	575	40
Future Volume (vph)	15	10	5	460	575	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.945				0.991	
Fit Protected	0.971				0.999	
Satd. Flow (prot)	1675	0	0	1858	1840	0
Fit Permitted	0.971				0.999	
Satd. Flow (perm)	1675	0	0	1858	1840	0
Link Speed (k/h)	40				50	50
Link Distance (m)	171.2				103.0	134.8
Travel Time (s)	15.4				7.4	9.7
Confl. Peds. (#/hr)	1	2	34			34
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	10%	20%	2%	2%	7%
Adj. Flow (vph)	16	11	5	484	605	42
Shared Lane Traffic (%)						
Lane Group Flow (vph)	27	0	0	489	647	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6				0.0	0.0
Link Offset(m)	0.0				0.0	0.0
Crosswalk Width(m)	1.6				1.6	1.6
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24	14		
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	43.5%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

7: Kerr Street & Elmwood Road

02/28/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔		
Traffic Volume (veh/h)	15	10	5	460	575	40
Future Volume (Veh/h)	15	10	5	460	575	40
Sign Control	Stop		Free			
Grade	0%		0%			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	11	5	484	605	42
Pedestrians	34		2			
Lane Width (m)	3.6		3.6			
Walking Speed (m/s)	1.1		1.1			
Percent Blockage	3		0			
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)			103		262	
pX, platoon unblocked	0.85	0.81	0.81			
vC, conflicting volume	1155	662	681			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	889	464	488			
tC, single (s)	6.4	6.3	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.4			
p0 queue free %	94	98	99			
cM capacity (veh/h)	258	455	775			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	27	489	647			
Volume Left	16	5	0			
Volume Right	11	0	42			
cSH	313	775	1700			
Volume to Capacity	0.09	0.01	0.38			
Queue Length 95th (m)	2.1	0.1	0.0			
Control Delay (s)	17.6	0.2	0.0			
Lane LOS	C	A				
Approach Delay (s)	17.6	0.2	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			43.5%		ICU Level of Service A	
Analysis Period (min)	15					

Lanes, Volumes, Timings

8: Kerr Street & Stewart Street

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Volume (vph)	50	10	15	10	15	75	10	340	15	55	480	50
Future Volume (vph)	50	10	15	10	15	75	10	340	15	55	480	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.97		0.96		1.00		1.00					
Frt	0.973		0.898		0.995		0.989					
Flt Protected	0.968		0.995		0.999		0.995					
Satd. Flow (prot)	0	1705	0	0	1577	0	0	1854	0	0	1826	0
Flt Permitted	0.771		0.967		0.983		0.932					
Satd. Flow (perm)	0	1333	0	0	1530	0	0	1823	0	0	1708	0
Right Turn on Red			Yes		Yes		Yes					
Satd. Flow (RTOR)	16		82		3		9					
Link Speed (k/h)	40		40		50		50					
Link Distance (m)	95.6		60.6		165.0		103.0					
Travel Time (s)	8.6		5.5		11.9		7.4					
Confl. Peds. (#/hr)	20		15		15		20		35		25	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Adj. Flow (vph)	54	11	16	11	16	82	11	370	16	60	522	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	81	0	0	109	0	0	397	0	0	636	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0		0.0		0.0		0.0					
Link Offset(m)	0.0		0.0		0.0		0.0					
Crosswalk Width(m)	1.6		1.6		1.6		1.6					
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases	4		8		8		2		2		6	
Permitted Phases	4		8		8		2		2		6	

Lanes, Volumes, Timings
8: Kerr Street & Stewart Street

02/28/2024

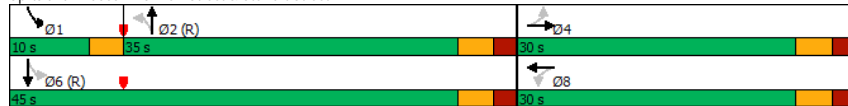


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		24.0	24.0		6.0	24.0	
Minimum Split (s)	30.0	30.0		30.0	30.0		32.0	32.0		10.0	32.0	
Total Split (s)	30.0	30.0		30.0	30.0		35.0	35.0		10.0	45.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		46.7%	46.7%		13.3%	60.0%	
Maximum Green (s)	24.6	24.6		24.6	24.6		29.6	29.6		7.0	39.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.0	3.3	
All-Red Time (s)	2.1	2.1		2.1	2.1		2.1	2.1		0.0	2.1	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.4			5.4			5.4			5.4	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
Recall Mode	None	None		None	None		C-Min	C-Min		None	C-Min	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	20	20		20	20		35	35		35	35	
Act Effect Green (s)		15.2			15.2			53.2			53.2	
Actuated g/C Ratio		0.20			0.20			0.71			0.71	
v/c Ratio		0.29			0.29			0.31			0.52	
Control Delay		21.5			9.9			7.5			10.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		21.5			9.9			7.5			10.3	
LOS		C			A			A			B	
Approach Delay		21.5			9.9			7.5			10.3	
Approach LOS		C			A			A			B	

Intersection Summary

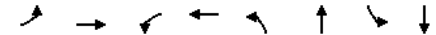
Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.52
 Intersection Signal Delay: 10.1 Intersection LOS: B
 Intersection Capacity Utilization 78.4% ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 8: Kerr Street & Stewart Street



Timings
8: Kerr Street & Stewart Street

02/28/2024

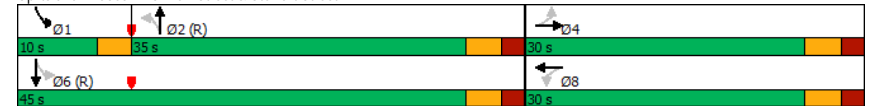


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔		↔		↔		↔
Traffic Volume (vph)	50	10	10	15	10	340	55	480
Future Volume (vph)	50	10	10	15	10	340	55	480
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	24.0	24.0	6.0	24.0
Minimum Split (s)	30.0	30.0	30.0	30.0	32.0	32.0	10.0	32.0
Total Split (s)	30.0	30.0	30.0	30.0	35.0	35.0	10.0	45.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	46.7%	46.7%	13.3%	60.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.0	3.3
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	2.1
Lost Time Adjust (s)		0.0		0.0		0.0		0.0
Total Lost Time (s)		5.4		5.4		5.4		5.4
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effect Green (s)		15.2		15.2		53.2		53.2
Actuated g/C Ratio		0.20		0.20		0.71		0.71
v/c Ratio		0.29		0.29		0.31		0.52
Control Delay		21.5		9.9		7.5		10.3
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		21.5		9.9		7.5		10.3
LOS		C		A		A		B
Approach Delay		21.5		9.9		7.5		10.3
Approach LOS		C		A		A		B

Intersection Summary

Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.52
 Intersection Signal Delay: 10.1 Intersection LOS: B
 Intersection Capacity Utilization 78.4% ICU Level of Service D
 Analysis Period (min) 15

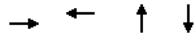
Splits and Phases: 8: Kerr Street & Stewart Street



Queues

8: Kerr Street & Stewart Street

02/28/2024

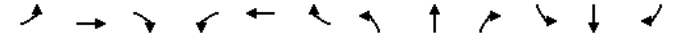


Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	81	109	397	636
w/c Ratio	0.29	0.29	0.31	0.52
Control Delay	21.5	9.9	7.5	10.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.5	9.9	7.5	10.3
Queue Length 50th (m)	8.5	3.4	15.8	31.1
Queue Length 95th (m)	16.4	13.0	47.3	93.8
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)				
Base Capacity (vph)	447	556	1293	1213
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced w/c Ratio	0.18	0.20	0.31	0.52
Intersection Summary				

HCM Signalized Intersection Capacity Analysis

8: Kerr Street & Stewart Street

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	50	10	15	10	15	75	10	340	15	55	480	50
Future Volume (vph)	50	10	15	10	15	75	10	340	15	55	480	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.4			5.4			5.4			5.4	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.99			0.96			1.00			0.99	
Flpb, ped/bikes		0.98			1.00			1.00			1.00	
Frt		0.97			0.90			0.99			0.99	
Flt Protected		0.97			0.99			1.00			1.00	
Satd. Flow (prot)		1675			1575			1852			1822	
Flt Permitted		0.77			0.97			0.98			0.93	
Satd. Flow (perm)		1334			1530			1823			1707	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	11	16	11	16	82	11	370	16	60	522	54
RTOR Reduction (vph)	0	13	0	0	68	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	68	0	0	41	0	0	396	0	0	633	0
Confl. Peds. (#/hr)	20		15	15		20	35		25	25		35
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.2			13.2			51.0			51.0	
Effective Green, g (s)		13.2			13.2			51.0			51.0	
Actuated g/C Ratio		0.18			0.18			0.68			0.68	
Clearance Time (s)		5.4			5.4			5.4			5.4	
Vehicle Extension (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		234			269			1239			1160	
v/s Ratio Prot												
v/s Ratio Perm		c0.05			0.03			0.22			c0.37	
v/c Ratio		0.29			0.15			0.32			0.55	
Uniform Delay, d1		26.8			26.2			4.9			6.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.9			0.4			0.7			0.5	
Delay (s)		27.8			26.5			5.6			6.6	
Level of Service		C			C			A			A	
Approach Delay (s)		27.8			26.5			5.6			6.6	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		9.5			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.52										
Actuated Cycle Length (s)		75.0			Sum of lost time (s)			13.8				
Intersection Capacity Utilization		78.4%			ICU Level of Service			D				
Analysis Period (min)		15										

c Critical Lane Group

Lanes, Volumes, Timings

9: Speers Internal Road 1 & Speers Road

02/28/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖	↗
Traffic Volume (vph)	980	35	5	1525	0	5
Future Volume (vph)	980	35	5	1525	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt	0.995			0.865		
Flt Protected						
Satd. Flow (prot)	3592	0	0	3610	1644	0
Flt Permitted						
Satd. Flow (perm)	3592	0	0	3610	1644	0
Link Speed (k/h)	60			60	20	
Link Distance (m)	147.2			113.4	44.5	
Travel Time (s)	8.8			6.8	8.0	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1000	36	5	1556	0	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1036	0	0	1561	5	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.6%
Analysis Period (min)	15
	ICU Level of Service B

HCM Unsignalized Intersection Capacity Analysis

9: Speers Internal Road 1 & Speers Road

02/28/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖	↗
Traffic Volume (veh/h)	980	35	5	1525	0	5
Future Volume (Veh/h)	980	35	5	1525	0	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	1000	36	5	1556	0	5
Pedestrians	1			1		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	147			347		
pX, platoon unblocked			0.88	0.90	0.88	
vC, conflicting volume			1036	1807	519	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			771	1088	184	
tC, single (s)			4.1	6.8	6.9	
tC, 2 stage (s)						
tF (s)			2.2	3.5	3.3	
p0 queue free %			99	100	99	
cM capacity (veh/h)			751	191	733	

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	667	369	524	1037	5
Volume Left	0	0	5	0	0
Volume Right	0	36	0	0	5
cSH	1700	1700	751	1700	733
Volume to Capacity	0.39	0.22	0.01	0.61	0.01
Queue Length 95th (m)	0.0	0.0	0.2	0.0	0.2
Control Delay (s)	0.0	0.0	0.2	0.0	9.9
Lane LOS			A		A
Approach Delay (s)	0.0		0.1		9.9
Approach LOS					A

Intersection Summary

Average Delay	0.1
Intersection Capacity Utilization	55.6%
Analysis Period (min)	15
	ICU Level of Service B

Lanes, Volumes, Timings

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/28/2024

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↕	↕	↔	↔
Traffic Volume (vph)	0	5	0	0	35	5
Future Volume (vph)	0	5	0	0	35	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected						0.958
Satd. Flow (prot)	1644	0	1900	0	0	1820
Flt Permitted						0.958
Satd. Flow (perm)	1644	0	1900	0	0	1820
Link Speed (k/h)	20					
Link Distance (m)	35.0		49.5		44.5	
Travel Time (s)	6.3		8.9		8.0	
Confl. Peds. (#/hr)	8					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%					
Adj. Flow (vph)	0	6	0	0	44	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	0	0	0	0	50
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6					
Link Offset(m)	0.0					
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	14		24	
Sign Control	Stop		Free		Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	15.7% ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/28/2024

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↕	↕	↔	↔
Traffic Volume (veh/h)	0	5	0	0	35	5
Future Volume (Veh/h)	0	5	0	0	35	5
Sign Control	Stop		Free		Free	
Grade	0%					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	6	0	0	44	6
Pedestrians	2					
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0					1
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	96	8	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	96	8	0			
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			97	
cM capacity (veh/h)	882	1072			1636	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	6	0	50
Volume Left	0	0	44
Volume Right	6	0	0
cSH	1072	1700	1636
Volume to Capacity	0.01	0.00	0.03
Queue Length 95th (m)	0.1	0.0	0.6
Control Delay (s)	8.4	0.0	6.4
Lane LOS	A		A
Approach Delay (s)	8.4	0.0	6.4
Approach LOS	A		

Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	15.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings

11: PUDO + Parking & Speers Internal Road

02/28/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (vph)	25	10	5	5	0	5
Future Volume (vph)	25	10	5	5	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.961					0.865
Flt Protected				0.976		
Satd. Flow (prot)	1826	0	0	1854	1644	0
Flt Permitted				0.976		
Satd. Flow (perm)	1826	0	0	1854	1644	0
Link Speed (k/h)	20		20		20	
Link Distance (m)	35.0		37.7		75.1	
Travel Time (s)	6.3		6.8		13.5	
Confl. Peds. (#/hr)				13		
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	32	13	6	6	0	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	45	0	0	12	6	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0		0.0		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	14		24		24	
Sign Control	Free		Free		Stop	

Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	14.7%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

11: PUDO + Parking & Speers Internal Road

02/28/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (veh/h)	25	10	5	5	0	5
Future Volume (Veh/h)	25	10	5	5	0	5
Sign Control	Free		Free		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	32	13	6	6	0	6
Pedestrians	13		2			
Lane Width (m)	3.6		3.6			
Walking Speed (m/s)	1.1		1.1			
Percent Blockage	1		0			
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			45		70	40
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			45		70	40
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			1576		925	1035

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	45	12	6
Volume Left	0	6	0
Volume Right	13	0	6
cSH	1700	1576	1035
Volume to Capacity	0.03	0.00	0.01
Queue Length 95th (m)	0.0	0.1	0.1
Control Delay (s)	0.0	3.7	8.5
Lane LOS	A		
Approach Delay (s)	0.0	3.7	8.5
Approach LOS	A		

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	14.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings

12: Underground & Speers Internal Road

02/28/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (vph)	25	5	5	10	0	0
Future Volume (vph)	25	5	5	10	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.979					
Flt Protected				0.984		
Satd. Flow (prot)	1860	0	0	1870	1900	0
Flt Permitted				0.984		
Satd. Flow (perm)	1860	0	0	1870	1900	0
Link Speed (k/h)	20		20		20	
Link Distance (m)	37.7		38.9		38.9	
Travel Time (s)	6.8		7.0		7.0	
Confl. Peds. (#/hr)			10			
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	32	6	6	13	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	38	0	0	19	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0		0.0		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	14		24		24	
Sign Control	Free		Free		Stop	

Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	8.3%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

12: Underground & Speers Internal Road

02/28/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (veh/h)	25	5	5	10	0	0
Future Volume (Veh/h)	25	5	5	10	0	0
Sign Control	Free		Free		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	32	6	6	13	0	0
Pedestrians	10		3			
Lane Width (m)	3.6		3.6			
Walking Speed (m/s)	1.1		1.1			
Percent Blockage	1		0			
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			38		70 38	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			38		70 38	
tC, single (s)			4.1		6.4 6.2	
tC, 2 stage (s)						
tF (s)			2.2		3.5 3.3	
p0 queue free %			100		100 100	
cM capacity (veh/h)			1585		927 1037	

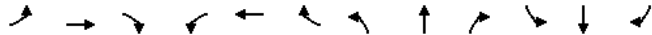
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	38	19	0
Volume Left	0	6	0
Volume Right	6	0	0
cSH	1700	1585	1700
Volume to Capacity	0.02	0.00	0.01
Queue Length 95th (m)	0.0	0.1	0.0
Control Delay (s)	0.0	2.3	0.0
Lane LOS	A A A		
Approach Delay (s)	0.0	2.3	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	8.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings

13: PUDO Exit/Speers Internal Road 2 & Speers Internal Road/30 Speers

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↔	
Traffic Volume (vph)	5	20	0	0	0	10	0	5	0	0	0	15
Future Volume (vph)	5	20	0	0	0	10	0	5	0	0	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.865						0.865
Flt Protected	0.990											
Satd. Flow (prot)	0	1809	0	0	1644	0	0	1900	0	0	1467	0
Flt Permitted	0.990											
Satd. Flow (perm)	0	1809	0	0	1644	0	0	1900	0	0	1467	0
Link Speed (k/h)	20		20		20		20		20		20	
Link Distance (m)	38.9		43.4		75.5		49.2		49.2		8.9	
Travel Time (s)	7.0		7.8		13.6		8.9		8.9		8.9	
Confl. Peds. (#/hr)	2		8	8		2		7	7			
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Heavy Vehicles (%)	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%
Adj. Flow (vph)	8	32	0	0	0	16	0	8	0	0	0	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	40	0	0	16	0	0	8	0	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6		1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control	Stop		Stop		Free		Free		Free		Free	

Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	19.3%		ICU Level of Service A									
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

13: PUDO Exit/Speers Internal Road 2 & Speers Internal Road/30 Speers

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔			↕			↔		
Traffic Volume (veh/h)	5	20	0	0	0	10	0	5	0	0	0	15	
Future Volume (Veh/h)	5	20	0	0	0	10	0	5	0	0	0	15	
Sign Control	Stop		Stop		Free		Free		Free		Free		
Grade	0%												
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	
Hourly flow rate (vph)	8	32	0	0	0	16	0	8	0	0	0	24	
Pedestrians	3		7		8		3		3		3		
Lane Width (m)	3.6		3.6		3.6		3.6		3.6		3.6		
Walking Speed (m/s)	1.1		1.1		1.1		1.1		1.1		1.1		
Percent Blockage	0		1		1		0		0		0		
Right turn flare (veh)													
Median type						None				None			
Median storage (veh)													
Upstream signal (m)													
pX, platoon unblocked													
vC, conflicting volume	42	30	23	51	42	18	27						15
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	42	30	23	51	42	18	27						15
tC, single (s)	7.3	6.5	6.2	7.1	6.5	6.2	4.1						4.1
tC, 2 stage (s)													
tF (s)	3.7	4.0	3.3	3.5	4.0	3.3	2.2						2.2
p0 queue free %	99	96	100	100	100	98	100						100
cM capacity (veh/h)	893	859	1049	907	846	1057	1596						1606

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	40	16	8	24
Volume Left	8	0	0	0
Volume Right	0	16	0	24
cSH	866	1057	1596	1606
Volume to Capacity	0.05	0.02	0.00	0.00
Queue Length 95th (m)	1.1	0.4	0.0	0.0
Control Delay (s)	9.4	8.5	0.0	0.0
Lane LOS	A	A		
Approach Delay (s)	9.4	8.5	0.0	0.0
Approach LOS	A	A		

Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	19.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (vph)	0	985	5	10	1515	0	10	0	10	5	0	5
Future Volume (vph)	0	985	5	10	1515	0	10	0	10	5	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999						0.932			0.932	
Flt Protected								0.976			0.976	
Satd. Flow (prot)	0	3536	0	0	3540	0	0	1728	0	0	1694	0
Flt Permitted								0.976			0.976	
Satd. Flow (perm)	0	3536	0	0	3540	0	0	1728	0	0	1694	0
Link Speed (k/h)		60			60			20			20	
Link Distance (m)		113.4			233.1			49.2			39.0	
Travel Time (s)		6.8			14.0			8.9			7.0	
Confl. Peds. (#/hr)			8	8								
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	2%	0%	2%	2%	2%
Adj. Flow (vph)	0	1037	5	11	1595	0	11	0	11	5	0	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1042	0	0	1606	0	0	22	0	0	10	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	58.9%
ICU Level of Service	B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (veh/h)	0	985	5	10	1515	0	10	0	10	5	0	5
Future Volume (Veh/h)	0	985	5	10	1515	0	10	0	10	5	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Hourly flow rate (vph)	0	1037	5	11	1595	0	11	0	11	5	0	5
Pedestrians		4			4			8			8	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		0			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		261			233							
pX, platoon unblocked	0.84				0.90			0.89	0.89	0.90	0.89	0.84
vC, conflicting volume	1595				1050			1876	2664	533	2150	2667
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1327				838			1239	2126	265	1548	2129
tC, single (s)	4.1				4.1			7.5	6.5	6.9	7.5	6.5
tC, 2 stage (s)												
tF (s)	2.2				2.2			3.5	4.0	3.3	3.5	4.0
p0 queue free %	100				98			90	100	98	92	100
cM capacity (veh/h)	434				721			115	43	660	66	43

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	691	351	543	1063	22	10
Volume Left	0	0	11	0	11	5
Volume Right	0	5	0	0	11	5
cSH	1700	1700	721	1700	195	118
Volume to Capacity	0.41	0.21	0.02	0.63	0.11	0.09
Queue Length 95th (m)	0.0	0.0	0.4	0.0	2.8	2.1
Control Delay (s)	0.0	0.0	0.4	0.0	25.8	38.4
Lane LOS			A		D	E
Approach Delay (s)	0.0		0.1		25.8	38.4
Approach LOS			D		E	

Intersection Summary

Average Delay	0.4
Intersection Capacity Utilization	58.9%
ICU Level of Service	B
Analysis Period (min)	15

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	35	645	90	185	485	185	100	115	370	350	165	75
Future Volume (vph)	35	645	90	185	485	185	100	115	370	350	165	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	105.0		0.0	75.0		100.0	50.0		45.0	80.0		75.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor	0.98		0.97	1.00		0.94	0.95		0.93	0.92		0.93
Frt		0.850				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3539	1615	1752	3539	1583	1787	1900	1599	3467	1900	1615
Flt Permitted	0.464			0.307			0.647			0.568		
Satd. Flow (perm)	862	3539	1560	565	3539	1485	1160	1900	1486	1910	1900	1501
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			112			195			253			81
Link Speed (k/h)		60			60			50				50
Link Distance (m)		235.8			147.2			127.4				167.2
Travel Time (s)		14.1			8.8			9.2				12.0
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Adj. Flow (vph)	37	679	95	195	511	195	105	121	389	368	174	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	679	95	195	511	195	105	121	389	368	174	79
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			7.2				7.2
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		1.6			1.6			1.6				1.6
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Detector Phase	1	6	6	5	2	2	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	7.0	25.0	25.0	7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	10.0	30.9	30.9	10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3	34.3
Total Split (s)	11.0	42.0	42.0	14.0	45.0	45.0	11.0	40.0	40.0	24.0	53.0	53.0
Total Split (%)	9.2%	35.0%	35.0%	11.7%	37.5%	37.5%	9.2%	33.3%	33.3%	20.0%	44.2%	44.2%
Maximum Green (s)	8.0	36.1	36.1	11.0	39.1	39.1	8.0	33.7	33.7	21.0	46.7	46.7
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	0.0	2.2	2.2	0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.5	5.5	5.5	2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	4.0
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		14.0	14.0		14.0	14.0		14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		15	15		15	15		35	35		35	35
Act Effect Green (s)	65.9	55.9	55.9	73.0	63.9	63.9	32.8	20.6	20.6	41.0	25.8	25.8
Actuated g/C Ratio	0.55	0.47	0.47	0.61	0.53	0.53	0.27	0.17	0.17	0.34	0.22	0.22
v/c Ratio	0.07	0.41	0.12	0.43	0.27	0.22	0.29	0.37	0.84	0.44	0.43	0.20
Control Delay	13.5	25.0	4.1	15.6	18.7	3.9	27.4	44.7	31.7	29.4	41.8	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	25.0	4.1	15.6	18.7	3.9	27.4	44.7	31.7	29.4	41.8	7.4
LOS	B	C	A	B	B	A	C	D	C	C	D	A
Approach Delay		22.1			14.8			33.5				30.1
Approach LOS		C			B			C				C
Intersection Summary												
Area Type:	Other											
Cycle Length:	120											
Actuated Cycle Length:	120											
Offset:	43 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green											
Natural Cycle:	90											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.84											
Intersection Signal Delay:	23.9						Intersection LOS: C					
Intersection Capacity Utilization:	72.5%						ICU Level of Service C					
Analysis Period (min):	15											
Splits and Phases:	1: Kerr Street & Speers Road											

Timings
1: Kerr Street & Speers Road

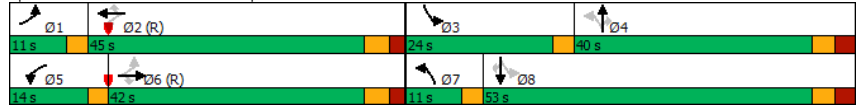
02/28/2024

	↖	→	↘	↙	←	↖	↙	↘	↗	↖	↘	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↖↖	↘	↘	↖↖	↘	↖	↖	↖	↘↘	↖	↘
Traffic Volume (vph)	35	645	90	185	485	185	100	115	370	350	165	75
Future Volume (vph)	35	645	90	185	485	185	100	115	370	350	165	75
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Detector Phase	1	6	6	5	2	2	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	7.0	25.0	25.0	7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	10.0	30.9	30.9	10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3	34.3
Total Split (s)	11.0	42.0	42.0	14.0	45.0	45.0	11.0	40.0	40.0	24.0	53.0	53.0
Total Split (%)	9.2%	35.0%	35.0%	11.7%	37.5%	37.5%	9.2%	33.3%	33.3%	20.0%	44.2%	44.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	0.0	2.2	2.2	0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
Act Effect Green (s)	65.9	55.9	55.9	73.0	63.9	63.9	32.8	20.6	20.6	41.0	25.8	25.8
Actuated g/C Ratio	0.55	0.47	0.47	0.61	0.53	0.53	0.27	0.17	0.17	0.34	0.22	0.22
v/c Ratio	0.07	0.41	0.12	0.43	0.27	0.22	0.29	0.37	0.84	0.44	0.43	0.20
Control Delay	13.5	25.0	4.1	15.6	18.7	3.9	27.4	44.7	31.7	29.4	41.8	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	25.0	4.1	15.6	18.7	3.9	27.4	44.7	31.7	29.4	41.8	7.4
LOS	B	C	A	B	B	A	C	D	C	C	D	A
Approach Delay		22.1			14.8			33.5			30.1	
Approach LOS		C			B			C			C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 43 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.84
 Intersection Signal Delay: 23.9
 Intersection LOS: C
 Intersection Capacity Utilization 72.5%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 1: Kerr Street & Speers Road



Queues
1: Kerr Street & Speers Road

02/28/2024

	↖	→	↘	↙	←	↖	↙	↘	↗	↖	↘	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	37	679	95	195	511	195	105	121	389	368	174	79
v/c Ratio	0.07	0.41	0.12	0.43	0.27	0.22	0.29	0.37	0.84	0.44	0.43	0.20
Control Delay	13.5	25.0	4.1	15.6	18.7	3.9	27.4	44.7	31.7	29.4	41.8	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	25.0	4.1	15.6	18.7	3.9	27.4	44.7	31.7	29.4	41.8	7.4
Queue Length 50th (m)	3.3	54.1	0.0	19.1	35.8	0.0	17.2	25.4	31.8	32.6	36.0	0.0
Queue Length 95th (m)	10.2	92.8	9.0	40.7	60.7	14.7	24.2	37.6	61.8	35.9	47.0	9.9
Internal Link Dist (m)		211.8			123.2		103.4			143.2		
Turn Bay Length (m)	105.0			75.0		100.0	50.0		45.0	80.0		75.0
Base Capacity (vph)	542	1647	785	467	1885	882	366	533	599	925	739	633
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.41	0.12	0.42	0.27	0.22	0.29	0.23	0.65	0.40	0.24	0.12

Intersection Summary

HCM Signalized Intersection Capacity Analysis

1: Kerr Street & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔↔	↔	↔
Traffic Volume (vph)	35	645	90	185	485	185	100	115	370	350	165	75
Future Volume (vph)	35	645	90	185	485	185	100	115	370	350	165	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.94	1.00	1.00	0.93	1.00	1.00	0.93
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00	0.96	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1785	3539	1560	1751	3539	1485	1734	1900	1486	3322	1900	1501
Flt Permitted	0.46	1.00	1.00	0.31	1.00	1.00	0.65	1.00	1.00	0.57	1.00	1.00
Satd. Flow (perm)	871	3539	1560	565	3539	1485	1182	1900	1486	1986	1900	1501
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	37	679	95	195	511	195	105	121	389	368	174	79
RTOR Reduction (vph)	0	0	51	0	0	93	0	0	210	0	0	62
Lane Group Flow (vph)	37	679	44	195	511	102	105	121	179	368	174	17
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Actuated Green, G (s)	60.3	55.9	55.9	70.1	62.7	62.7	29.5	20.6	20.6	37.7	25.8	25.8
Effective Green, g (s)	60.3	55.9	55.9	70.1	62.7	62.7	29.5	20.6	20.6	37.7	25.8	25.8
Actuated g/C Ratio	0.50	0.47	0.47	0.58	0.52	0.52	0.25	0.17	0.17	0.31	0.22	0.22
Clearance Time (s)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Vehicle Extension (s)	2.5	5.5	5.5	2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	471	1648	726	440	1849	775	331	326	255	780	408	322
v/s Ratio Prot	0.00	0.19		c0.04	0.14		0.02	0.06		c0.06	0.09	
v/s Ratio Perm	0.04		0.03	c0.22		0.07	0.05		c0.12	0.09		0.01
v/c Ratio	0.08	0.41	0.06	0.44	0.28	0.13	0.32	0.37	0.70	0.47	0.43	0.05
Uniform Delay, d1	15.2	21.2	17.6	12.6	16.0	14.7	36.3	44.0	46.8	31.8	40.7	37.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.8	0.2	0.5	0.4	0.4	0.4	1.0	9.1	0.3	1.0	0.1
Delay (s)	15.2	21.9	17.8	13.2	16.4	15.0	36.7	44.9	55.9	32.1	41.7	37.5
Level of Service	B	C	B	B	B	B	D	D	E	C	D	D
Approach Delay (s)		21.2			15.4			50.5			35.5	
Approach LOS		C			B			D			D	

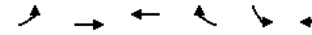
Intersection Summary		
HCM 2000 Control Delay	28.5	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.51	
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	72.5%	ICU Level of Service
Analysis Period (min)	15	

c Critical Lane Group

Lanes, Volumes, Timings

2: Speers Road & Cross Avenue

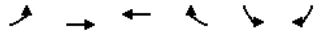
02/28/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔↔	↔	↔	↔	↔
Traffic Volume (vph)	200	1195	595	20	5	245
Future Volume (vph)	200	1195	595	20	5	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	80.0			0.0	45.0	0.0
Storage Lanes	1			0	1	2
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	0.88
Ped Bike Factor	1.00		1.00			
Frt			0.995			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1703	3610	3554	0	1805	2733
Flt Permitted	0.378				0.950	
Satd. Flow (perm)	676	3610	3554	0	1805	2733
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			3			255
Link Speed (k/h)		60	60		48	
Link Distance (m)		233.1	101.5		84.0	
Travel Time (s)		14.0	6.1		6.3	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Adj. Flow (vph)	208	1245	620	21	5	255
Shared Lane Traffic (%)						
Lane Group Flow (vph)	208	1245	641	0	5	255
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
2: Speers Road & Cross Avenue

02/28/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Detector Phase	5	2	6		4	4
Switch Phase						
Minimum Initial (s)	6.0	38.0	38.0		10.0	10.0
Minimum Split (s)	12.0	47.6	47.6		15.8	15.8
Total Split (s)	35.0	109.0	74.0		31.0	31.0
Total Split (%)	25.0%	77.9%	52.9%		22.1%	22.1%
Maximum Green (s)	29.0	102.4	67.4		25.2	25.2
Yellow Time (s)	4.0	3.7	3.7		3.3	3.3
All-Red Time (s)	2.0	2.9	2.9		2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6		5.8	5.8
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Recall Mode	None	C-Min	C-Min		None	None
Walk Time (s)		10.0	10.0			
Flash Dont Walk (s)		31.0	31.0			
Pedestrian Calls (#/hr)		5	5			
Act Effect Green (s)	118.0	117.4	102.3		10.2	10.2
Actuated g/C Ratio	0.84	0.84	0.73		0.07	0.07
v/c Ratio	0.33	0.41	0.25		0.04	0.58
Control Delay	3.4	3.3	6.6		60.8	12.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	3.4	3.3	6.6		60.8	12.8
LOS	A	A	A		E	B
Approach Delay		3.3	6.6		13.7	
Approach LOS		A	A		B	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 99 (71%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 5.3
 Intersection Capacity Utilization 68.9%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 2: Speers Road & Cross Avenue



Timings
2: Speers Road & Cross Avenue

02/28/2024

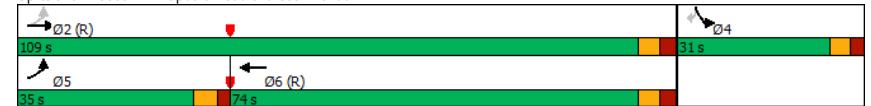


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↕↕	↕↕	↔	↕↕
Traffic Volume (vph)	200	1195	595	5	245
Future Volume (vph)	200	1195	595	5	245
Turn Type	pm+pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2				4
Detector Phase	5	2	6	4	4
Switch Phase					
Minimum Initial (s)	6.0	38.0	38.0	10.0	10.0
Minimum Split (s)	12.0	47.6	47.6	15.8	15.8
Total Split (s)	35.0	109.0	74.0	31.0	31.0
Total Split (%)	25.0%	77.9%	52.9%	22.1%	22.1%
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	None	None
Act Effect Green (s)	118.0	117.4	102.3	10.2	10.2
Actuated g/C Ratio	0.84	0.84	0.73	0.07	0.07
v/c Ratio	0.33	0.41	0.25	0.04	0.58
Control Delay	3.4	3.3	6.6	60.8	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.4	3.3	6.6	60.8	12.8
LOS	A	A	A	E	B
Approach Delay		3.3	6.6	13.7	
Approach LOS		A	A	B	

Intersection Summary

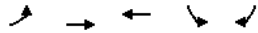
Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 99 (71%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 5.3
 Intersection Capacity Utilization 68.9%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 2: Speers Road & Cross Avenue



Queues
2: Speers Road & Cross Avenue

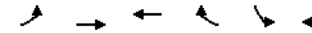
02/28/2024



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	208	1245	641	5	255
w/c Ratio	0.33	0.41	0.25	0.04	0.58
Control Delay	3.4	3.3	6.6	60.8	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.4	3.3	6.6	60.8	12.8
Queue Length 50th (m)	7.9	34.6	27.1	1.3	0.0
Queue Length 95th (m)	12.9	43.9	37.4	5.8	14.3
Internal Link Dist (m)		209.1	77.5	60.0	
Turn Bay Length (m)	80.0		45.0		
Base Capacity (vph)	782	3026	2597	324	701
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.27	0.41	0.25	0.02	0.36
Intersection Summary					

HCM Signalized Intersection Capacity Analysis
2: Speers Road & Cross Avenue

02/28/2024




Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗↘	↗↘		↘	↗↘
Traffic Volume (vph)	200	1195	595	20	5	245
Future Volume (vph)	200	1195	595	20	5	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.6	6.6		5.8	5.8
Lane Util. Factor	1.00	0.95	0.95		1.00	0.88
Frbp, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1701	3610	3555		1805	2733
Flt Permitted	0.38	1.00	1.00		0.95	1.00
Satd. Flow (perm)	677	3610	3555		1805	2733
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	208	1245	620	21	5	255
RTOR Reduction (vph)	0	0	1	0	0	236
Lane Group Flow (vph)	208	1245	640	0	5	19
Confl. Peds. (#/hr)	5			5		
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	117.4	117.4	102.3		10.2	10.2
Effective Green, g (s)	117.4	117.4	102.3		10.2	10.2
Actuated g/C Ratio	0.84	0.84	0.73		0.07	0.07
Clearance Time (s)	6.0	6.6	6.6		5.8	5.8
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Lane Grp Cap (vph)	634	3027	2597		131	199
v/s Ratio Prot	0.02	c0.34	0.18		0.00	
v/s Ratio Perm	0.25					c0.01
w/c Ratio	0.33	0.41	0.25		0.04	0.09
Uniform Delay, d1	2.4	2.8	6.2		60.3	60.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.4	0.4	0.2		0.1	0.2
Delay (s)	2.8	3.2	6.4		60.5	60.8
Level of Service	A	A	A		E	E
Approach Delay (s)		3.1	6.4		60.8	
Approach LOS		A	A		E	
Intersection Summary						
HCM 2000 Control Delay		10.4			HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio		0.40				
Actuated Cycle Length (s)		140.0			Sum of lost time (s)	18.4
Intersection Capacity Utilization		68.9%			ICU Level of Service	C
Analysis Period (min)		15				

c Critical Lane Group

Lanes, Volumes, Timings
3: St. Augustine Drive & Speers Road

02/28/2024




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕			↕				↕		↕	
Traffic Volume (vph)	5	720	15	0	635	20	5	0	50	0	0	0
Future Volume (vph)	5	720	15	0	635	20	5	0	50	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0			0			1			0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.995				0.865			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1805	3561	0	0	3557	0	0	0	1644	0	1900	0
Flt Permitted	0.950							0.950				
Satd. Flow (perm)	1805	3561	0	0	3557	0	0	0	1644	0	1900	0
Link Speed (k/h)		60			60				40			30
Link Distance (m)		248.1			235.8				188.1			117.6
Travel Time (s)		14.9			14.1				16.9			14.1
Confl. Peds. (#/hr)	8		5	5		8	1		1	1		1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	5	750	16	0	661	21	5	0	52	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	766	0	0	682	0	0	5	52	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6				0.0			0.0
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		1.6			1.6				1.6			1.6
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free				Stop			Stop

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
3: St. Augustine Drive & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕			↕				↕		↕	
Traffic Volume (veh/h)	5	720	15	0	635	20	5	0	50	0	0	0
Future Volume (Veh/h)	5	720	15	0	635	20	5	0	50	0	0	0
Sign Control		Free			Free				Stop			Stop
Grade		0%			0%				0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	750	16	0	661	21	5	0	52	0	0	0
Pedestrians		1			1				5			8
Lane Width (m)		3.6			3.6				3.6			3.6
Walking Speed (m/s)		1.1			1.1				1.1			1.1
Percent Blockage		0			0				0			1
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)					236							
pX, platoon unblocked	0.93						0.93	0.93		0.93	0.93	0.93
vC, conflicting volume	690				771				1104	1463	389	1118
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	515				771				961	1346	389	975
tC, single (s)	4.1				4.1				7.5	6.5	6.9	7.5
tC, 2 stage (s)												
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5
p0 queue free %	99				100				97	100	92	100
cM capacity (veh/h)	979				849				195	139	612	174
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1					
Volume Total	5	500	266	441	241	57	0					
Volume Left	5	0	0	0	0	5	0					
Volume Right	0	0	16	0	21	52	0					
cSH	979	1700	1700	1700	1700	515	1700					
Volume to Capacity	0.01	0.29	0.16	0.26	0.14	0.11	0.00					
Queue Length 95th (m)	0.1	0.0	0.0	0.0	0.0	2.8	0.0					
Control Delay (s)	8.7	0.0	0.0	0.0	0.0	12.9	0.0					
Lane LOS	A					B	A					
Approach Delay (s)	0.1				0.0	12.9	0.0					
Approach LOS						B	A					
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization			Err%		ICU Level of Service					H		
Analysis Period (min)			15									

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

02/28/2024

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙		↑	↗	↘	↓
Traffic Volume (vph)	80	165	270	60	95	515
Future Volume (vph)	80	165	270	60	95	515
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0	0.0		50.0	50.0	
Storage Lanes	0	0		1	1	
Taper Length (m)	2.5			2.5		
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor	0.98			0.97	1.00	
Frt	0.909			0.850		
Flt Protected	0.984			0.950		
Satd. Flow (prot)	1652	0	3574	1583	1805	3574
Flt Permitted	0.984			0.481		
Satd. Flow (perm)	1645	0	3574	1540	910	3574
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	126			62		
Link Speed (k/h)	50		50		50	
Link Distance (m)	265.3		167.2		94.4	
Travel Time (s)	19.1		12.0		6.8	
Confl. Peds. (#/hr)	13	6		4	4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	1%	1%	2%	0%	1%
Adj. Flow (vph)	82	170	278	62	98	531
Shared Lane Traffic (%)						
Lane Group Flow (vph)	252	0	278	62	98	531
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1		2	1	1	2
Detector Template	Left		Thru	Right	Left	Thru
Leading Detector (m)	2.0		10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0		0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4		9.4	
Detector 2 Size(m)			0.6		0.6	
Detector 2 Type			Cl+Ex		Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)			0.0		0.0	

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

02/28/2024

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Prot		NA	Perm	pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases				2	6	
Detector Phase	3		2	2	1	6
Switch Phase						
Minimum Initial (s)	10.0		18.0	18.0	7.0	18.0
Minimum Split (s)	31.4		28.2	28.2	11.0	28.2
Total Split (s)	32.0		40.0	40.0	14.0	54.0
Total Split (%)	37.2%		46.5%	46.5%	16.3%	62.8%
Maximum Green (s)	26.6		34.8	34.8	10.0	48.8
Yellow Time (s)	3.3		3.3	3.3	4.0	3.3
All-Red Time (s)	2.1		1.9	1.9	0.0	1.9
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4		5.2	5.2	4.0	5.2
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0		3.5	3.5	2.5	3.5
Recall Mode	None		Min	Min	None	Min
Walk Time (s)	10.0		10.0	10.0		10.0
Flash Dont Walk (s)	16.0		13.0	13.0		13.0
Pedestrian Calls (#/hr)	0		5	5		5
Act Effect Green (s)	11.3		19.2	19.2	29.0	27.7
Actuated g/C Ratio	0.23		0.38	0.38	0.58	0.56
v/c Ratio	0.53		0.20	0.10	0.15	0.27
Control Delay	14.5		12.0	4.5	5.3	6.1
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	14.5		12.0	4.5	5.3	6.1
LOS	B		B	A	A	A
Approach Delay	14.5		10.6			6.0
Approach LOS	B		B			A

Intersection Summary	
Area Type:	Other
Cycle Length:	86
Actuated Cycle Length:	49.9
Natural Cycle:	75
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.53
Intersection Signal Delay:	9.0
Intersection Capacity Utilization:	49.7%
Analysis Period (min):	15
Intersection LOS:	A
ICU Level of Service:	A

Splits and Phases: 4: Kerr Street & Shepherd Road



Timings

4: Kerr Street & Shepherd Road

02/28/2024

	↙	↑	↘	↙	↓
Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Configurations	↘	↑↑	↘	↘	↑↑
Traffic Volume (vph)	80	270	60	95	515
Future Volume (vph)	80	270	60	95	515
Turn Type	Prot	NA	Perm	pm+pt	NA
Protected Phases	3	2		1	6
Permitted Phases			2	6	
Detector Phase	3	2	2	1	6
Switch Phase					
Minimum Initial (s)	10.0	18.0	18.0	7.0	18.0
Minimum Split (s)	31.4	28.2	28.2	11.0	28.2
Total Split (s)	32.0	40.0	40.0	14.0	54.0
Total Split (%)	37.2%	46.5%	46.5%	16.3%	62.8%
Yellow Time (s)	3.3	3.3	3.3	4.0	3.3
All-Red Time (s)	2.1	1.9	1.9	0.0	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	5.2	5.2	4.0	5.2
Lead/Lag		Lag	Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes	
Recall Mode	None	Min	Min	None	Min
Act Effct Green (s)	11.3	19.2	19.2	29.0	27.7
Actuated g/C Ratio	0.23	0.38	0.38	0.58	0.56
v/c Ratio	0.53	0.20	0.10	0.15	0.27
Control Delay	14.5	12.0	4.5	5.3	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.5	12.0	4.5	5.3	6.1
LOS	B	B	A	A	A
Approach Delay	14.5	10.6			6.0
Approach LOS	B	B			A

Intersection Summary

Cycle Length: 86
 Actuated Cycle Length: 49.9
 Natural Cycle: 75
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.53
 Intersection Signal Delay: 9.0
 Intersection Capacity Utilization 49.7%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 4: Kerr Street & Shepherd Road



Queues

4: Kerr Street & Shepherd Road

02/28/2024

	↙	↑	↘	↙	↓
Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	252	278	62	98	531
v/c Ratio	0.53	0.20	0.10	0.15	0.27
Control Delay	14.5	12.0	4.5	5.3	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.5	12.0	4.5	5.3	6.1
Queue Length 50th (m)	9.7	8.5	0.0	3.0	10.1
Queue Length 95th (m)	29.3	17.8	6.0	9.0	20.7
Internal Link Dist (m)	241.3	143.2			70.4
Turn Bay Length (m)	30.0		50.0	50.0	
Base Capacity (vph)	956	2544	1114	711	3380
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.26	0.11	0.06	0.14	0.16

Intersection Summary

HCM Signalized Intersection Capacity Analysis

4: Kerr Street & Shepherd Road

02/28/2024

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	80	165	270	60	95	515
Future Volume (vph)	80	165	270	60	95	515
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4		5.2	5.2	4.0	5.2
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	0.95
Flpb, ped/bikes	0.99		1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.91		1.00	0.85	1.00	1.00
Flt Protected	0.98		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1654		3574	1545	1803	3574
Flt Permitted	0.98		1.00	1.00	0.48	1.00
Satd. Flow (perm)	1654		3574	1545	912	3574
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	82	170	278	62	98	531
RTOR Reduction (vph)	98	0	0	38	0	0
Lane Group Flow (vph)	154	0	278	24	98	531
Confl. Peds. (#/hr)	13	6		4	4	
Heavy Vehicles (%)	3%	1%	1%	2%	0%	1%
Turn Type	Prot		NA	Perm	pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases				2	6	
Actuated Green, G (s)	11.3		19.2	19.2	28.7	28.7
Effective Green, g (s)	11.3		19.2	19.2	28.7	28.7
Actuated g/C Ratio	0.22		0.38	0.38	0.57	0.57
Clearance Time (s)	5.4		5.2	5.2	4.0	5.2
Vehicle Extension (s)	3.0		3.5	3.5	2.5	3.5
Lane Grp Cap (vph)	369		1356	586	614	2027
v/s Ratio Prot	c0.09		0.08		0.02	c0.15
v/s Ratio Perm				0.02	0.07	
v/c Ratio	0.42		0.21	0.04	0.16	0.26
Uniform Delay, d1	16.8		10.6	9.9	5.2	5.6
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8		0.1	0.0	0.1	0.1
Delay (s)	17.6		10.7	9.9	5.3	5.6
Level of Service	B		B	A	A	A
Approach Delay (s)	17.6		10.5			5.6
Approach LOS	B		B			A

Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	50.6	Sum of lost time (s)	14.6
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

5: Kerr Street & Wycroft Road

02/28/2024

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	5	85	190	250	525	125
Future Volume (vph)	5	85	190	250	525	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	75.0	0.0	75.0			0.0
Storage Lanes	1	1	1			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850			0.971	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1553	1703	3610	3479	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1553	1703	3610	3479	0
Link Speed (k/h)	50		50	50	50	
Link Distance (m)	561.6		394.3	98.1		
Travel Time (s)	40.4		28.4	7.1		
Confl. Peds. (#/hr)			5			5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	4%	6%	0%	0%	4%
Adj. Flow (vph)	5	90	202	266	559	133
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	90	202	266	692	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6		3.6	3.6		
Link Offset(m)	0.0		0.0	0.0		
Crosswalk Width(m)	1.6		1.6	1.6		
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	42.5%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

5: Kerr Street & Wycroft Road

02/28/2024

Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Volume (veh/h)	5	85	190	250	525	125	
Future Volume (Veh/h)	5	85	190	250	525	125	
Sign Control	Stop		Free		Free		
Grade	0%		0%		0%		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	
Hourly flow rate (vph)	5	90	202	266	559	133	
Pedestrians	5						
Lane Width (m)	3.6						
Walking Speed (m/s)	1.1						
Percent Blockage	0						
Right turn flare (veh)							
Median type			None		None		
Median storage (veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	1168	351	697				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1168	351	697				
tC, single (s)	6.8	7.0	4.2				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.3				
p0 queue free %	97	86	77				
cM capacity (veh/h)	145	637	865				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	5	90	202	133	133	373	319
Volume Left	5	0	202	0	0	0	0
Volume Right	0	90	0	0	0	0	133
cSH	145	637	865	1700	1700	1700	1700
Volume to Capacity	0.03	0.14	0.23	0.08	0.08	0.22	0.19
Queue Length 95th (m)	0.8	3.7	6.9	0.0	0.0	0.0	0.0
Control Delay (s)	30.8	11.6	10.4	0.0	0.0	0.0	0.0
Lane LOS	D	B	B				
Approach Delay (s)	12.6		4.5		0.0		
Approach LOS	B						
Intersection Summary							
Average Delay			2.6				
Intersection Capacity Utilization			42.5%		ICU Level of Service		A
Analysis Period (min)			15				

Lanes, Volumes, Timings

6: Kerr Street & Prince Charles Drive

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	5	0	5	5	0	75	5	500	5	40	395	5	
Future Volume (vph)	5	0	5	5	0	75	5	500	5	40	395	5	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt	0.932		0.873		0.999		0.999						
Fit Protected	0.976		0.997		0.995		0.995						
Satd. Flow (prot)	0	1728	0	0	1654	0	0	1876	0	0	1846	0	
Fit Permitted	0.976		0.997		0.995		0.995						
Satd. Flow (perm)	0	1728	0	0	1654	0	0	1876	0	0	1846	0	
Link Speed (k/h)	40		40		50		50						
Link Distance (m)	57.8		56.0		134.8		127.4						
Travel Time (s)	5.2		5.0		9.7		9.2						
Confl. Peds. (#/hr)	4		1	1		4	21		31	31		21	
Confl. Bikes (#/hr)									1				
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Heavy Vehicles (%)	0%	50%	0%	0%	0%	0%	20%	1%	0%	5%	2%	4%	
Adj. Flow (vph)	5	0	5	5	0	79	5	526	5	42	416	5	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	10	0	0	84	0	0	536	0	0	463	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)	0.0		0.0		0.0		0.0		3.6				
Link Offset(m)	0.0		0.0		0.0		0.0		0.0				
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6				
Two way Left Turn Lane													
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (k/h)	24		14	24		14	24		14	24		14	
Sign Control	Stop		Stop		Free		Free		Free				
Intersection Summary													
Area Type:	Other												
Control Type:	Unsignalized												
Intersection Capacity Utilization	60.4%						ICU Level of Service B						
Analysis Period (min)	15												

HCM Unsignalized Intersection Capacity Analysis

6: Kerr Street & Prince Charles Drive

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	5	0	5	5	0	75	5	500	5	40	395	5
Future Volume (Veh/h)	5	0	5	5	0	75	5	500	5	40	395	5
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	0	5	5	0	79	5	526	5	42	416	5
Pedestrians	21			31			1			4		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	2			3			0			0		
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (m)							238			127		
pX, platoon unblocked	0.92	0.92	0.87	0.92	0.92	0.90	0.87				0.90	
vC, conflicting volume	1145	1096	440	1078	1096	564	442				562	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	874	820	283	801	820	461	285				460	
tC, single (s)	7.1	7.0	6.2	7.1	6.5	6.2	4.3				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.5	3.3	3.5	4.0	3.3	2.4				2.2	
p0 queue free %	97	100	99	98	100	85	100				96	
cM capacity (veh/h)	193	218	649	251	260	528	1009				951	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	10	84	536	463								
Volume Left	5	5	5	42								
Volume Right	5	79	5	5								
cSH	298	495	1009	951								
Volume to Capacity	0.03	0.17	0.00	0.04								
Queue Length 95th (m)	0.8	4.6	0.1	1.1								
Control Delay (s)	17.5	13.7	0.1	1.3								
Lane LOS	C	B	A	A								
Approach Delay (s)	17.5	13.7	0.1	1.3								
Approach LOS	C	B										
Intersection Summary												
Average Delay				1.8								
Intersection Capacity Utilization				60.4%	ICU Level of Service							B
Analysis Period (min)				15								

Lanes, Volumes, Timings

7: Kerr Street & Elmwood Road

02/28/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	30	10	5	480	360	45
Future Volume (vph)	30	10	5	480	360	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.965		0.985			
Fit Protected	0.964					
Satd. Flow (prot)	1723	0	0	1860	1825	0
Fit Permitted	0.964					
Satd. Flow (perm)	1723	0	0	1860	1825	0
Link Speed (k/h)	40		50			
Link Distance (m)	171.2		103.0		134.8	
Travel Time (s)	15.4		7.4		9.7	
Confl. Peds. (#/hr)	1	2	34			34
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	10%	20%	2%	2%	7%
Adj. Flow (vph)	32	11	5	505	379	47
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	0	0	510	426	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6		3.6			
Link Offset(m)	0.0		0.0			
Crosswalk Width(m)	1.6		1.6			
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24	14		
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	39.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

7: Kerr Street & Elmwood Road

02/28/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↕		↔	
Traffic Volume (veh/h)	30	10	5	480	360	45
Future Volume (Veh/h)	30	10	5	480	360	45
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	32	11	5	505	379	47
Pedestrians	34		2		1	
Lane Width (m)	3.6		3.6		3.6	
Walking Speed (m/s)	1.1		1.1		1.1	
Percent Blockage	3		0		0	
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)			103		262	
pX, platoon unblocked	0.91	0.93	0.93			
vC, conflicting volume	952	438	460			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	729	359	382			
tC, single (s)	6.4	6.3	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.4			
p0 queue free %	91	98	99			
cM capacity (veh/h)	345	601	978			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	43	510	426			
Volume Left	32	5	0			
Volume Right	11	0	47			
cSH	388	978	1700			
Volume to Capacity	0.11	0.01	0.25			
Queue Length 95th (m)	2.8	0.1	0.0			
Control Delay (s)	15.4	0.1	0.0			
Lane LOS	C	A				
Approach Delay (s)	15.4	0.1	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			39.9%		ICU Level of Service A	
Analysis Period (min)	15					

Lanes, Volumes, Timings

8: Kerr Street & Stewart Street

02/28/2024



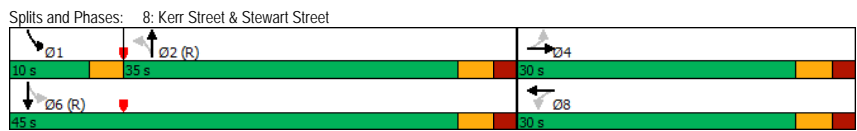
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↕		↕		↕		↕		↕	
Traffic Volume (vph)	35	25	5	20	35	70	5	380	20	40	300	30
Future Volume (vph)	35	25	5	20	35	70	5	380	20	40	300	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0		0.0		20.0		0.0		20.0	
Storage Lanes	0		0		0		1		0		1	
Taper Length (m)	2.5		2.5		2.5		2.5		2.5		2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98		0.97		0.97		0.97		1.00		0.98	
Frt	0.990		0.925		0.992		0.992		0.986		0.986	
Flt Protected	0.974		0.992		0.950		0.950		0.950		0.950	
Satd. Flow (prot)	0	1679	0	0	1616	0	1805	1846	0	1787	1828	0
Flt Permitted	0.796		0.941		0.547		0.429		0.429		0.429	
Satd. Flow (perm)	0	1353	0	0	1527	0	1005	1846	0	794	1828	0
Right Turn on Red			Yes		Yes				Yes			
Satd. Flow (RTOR)	5		76		4		10		50		50	
Link Speed (k/h)	40		40		50		50		103.0		103.0	
Link Distance (m)	95.6		60.6		165.0		103.0		7.4		7.4	
Travel Time (s)	8.6		5.5		11.9		7.4		7.4		7.4	
Confl. Peds. (#/hr)	20	15	15	20	35	25	25	35	25	25	35	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	17%	1%	2%	0%	0%
Adj. Flow (vph)	38	27	5	22	38	76	5	413	22	43	326	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	70	0	0	136	0	5	435	0	43	359	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0		0.0		3.6		3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6		1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24	14	24	14	24	14	24	14	24	14
Number of Detectors	1	2	1	2	1	2	1	2	1	2	1	2
Detector Template	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left	Thru
Leading Detector (m)	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4		9.4		9.4		9.4		9.4		9.4	
Detector 2 Size(m)	0.6		0.6		0.6		0.6		0.6		0.6	
Detector 2 Type	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0		0.0		0.0		0.0		0.0		0.0	

Lanes, Volumes, Timings
8: Kerr Street & Stewart Street

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	NA	pm+pt	NA	NA
Protected Phases		4			8			2			1	6
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		24.0	24.0		6.0	24.0	
Minimum Split (s)	30.0	30.0		30.0	30.0		32.0	32.0		10.0	32.0	
Total Split (s)	30.0	30.0		30.0	30.0		35.0	35.0		10.0	45.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		46.7%	46.7%		13.3%	60.0%	
Maximum Green (s)	24.6	24.6		24.6	24.6		29.6	29.6		7.0	39.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.0	3.3	
All-Red Time (s)	2.1	2.1		2.1	2.1		2.1	2.1		0.0	2.1	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.4			5.4		5.4	5.4		3.0	5.4	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
Recall Mode	None	None		None	None		C-Min	C-Min		None	C-Min	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0		
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		14.0	14.0		14.0		
Pedestrian Calls (#/hr)	20	20		20	20		35	35		35		
Act Effect Green (s)		15.2			15.2		47.4	47.4		54.5	53.2	
Actuated g/C Ratio		0.20			0.20		0.63	0.63		0.73	0.71	
v/c Ratio		0.25			0.37		0.01	0.37		0.07	0.28	
Control Delay		23.5			14.0		12.4	12.6		5.8	7.1	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		23.5			14.0		12.4	12.6		5.8	7.1	
LOS		C			B		B	B		A	A	
Approach Delay		23.5			14.0			12.6			7.0	
Approach LOS		C			B			B			A	

Intersection Summary	
Area Type:	Other
Cycle Length:	75
Actuated Cycle Length:	75
Offset:	13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	75
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.37
Intersection Signal Delay:	11.3
Intersection Capacity Utilization:	55.9%
ICU Level of Service:	B
Analysis Period (min):	15



Timings
8: Kerr Street & Stewart Street

02/28/2024

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔		↔	↔	↔	↔	↔
Traffic Volume (vph)	35	25	20	35	5	380	40	300
Future Volume (vph)	35	25	20	35	5	380	40	300
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	24.0	24.0	6.0	24.0
Minimum Split (s)	30.0	30.0	30.0	30.0	32.0	32.0	10.0	32.0
Total Split (s)	30.0	30.0	30.0	30.0	35.0	35.0	10.0	45.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	46.7%	46.7%	13.3%	60.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.0	3.3
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	2.1
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.4		5.4	5.4	5.4	3.0	5.4
Lead/Lag					Lag	Lag	Lead	Lead
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effect Green (s)		15.2		15.2	47.4	47.4	54.5	53.2
Actuated g/C Ratio		0.20		0.20	0.63	0.63	0.73	0.71
v/c Ratio		0.25		0.37	0.01	0.37	0.07	0.28
Control Delay		23.5		14.0	12.4	12.6	5.8	7.1
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		23.5		14.0	12.4	12.6	5.8	7.1
LOS		C		B	B	B	A	A
Approach Delay		23.5		14.0		12.6		7.0
Approach LOS		C		B		B		A

Intersection Summary	
Cycle Length:	75
Actuated Cycle Length:	75
Offset:	13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	75
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.37
Intersection Signal Delay:	11.3
Intersection Capacity Utilization:	55.9%
ICU Level of Service:	B
Analysis Period (min):	15



Queues

8: Kerr Street & Stewart Street

02/28/2024



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	70	136	5	435	43	359
w/c Ratio	0.25	0.37	0.01	0.37	0.07	0.28
Control Delay	23.5	14.0	12.4	12.6	5.8	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.5	14.0	12.4	12.6	5.8	7.1
Queue Length 50th (m)	8.5	7.8	0.3	28.4	1.2	13.5
Queue Length 95th (m)	15.7	18.1	2.2	72.1	6.0	41.5
Internal Link Dist (m)	71.6	36.6		141.0		79.0
Turn Bay Length (m)			20.0		20.0	
Base Capacity (vph)	447	551	634	1167	670	1298
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced w/c Ratio	0.16	0.25	0.01	0.37	0.06	0.28

Intersection Summary

HCM Signalized Intersection Capacity Analysis

8: Kerr Street & Stewart Street

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (vph)	35	25	5	20	35	70	5	380	20	40	300	30
Future Volume (vph)	35	25	5	20	35	70	5	380	20	40	300	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.4			5.4		5.4	5.4		3.0	5.4	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		0.97	1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	0.97	1.00	0.99	1.00		0.99	1.00	
Frt	0.99	0.92		0.92	1.00	0.99	1.00	0.99		1.00	0.99	
Flt Protected	0.97			0.99	0.95	1.00				0.95	1.00	
Satd. Flow (prot)	1656			1609	1745	1847				1774	1828	
Flt Permitted	0.80			0.94	0.55	1.00				0.43	1.00	
Satd. Flow (perm)	1354			1526	1004	1847				801	1828	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	27	5	22	38	76	5	413	22	43	326	33
RTOR Reduction (vph)	0	4	0	0	63	0	0	2	0	0	3	0
Lane Group Flow (vph)	0	66	0	0	73	0	5	433	0	43	356	0
Confl. Peds. (#/hr)	20		15	15		20	35		25	25		35
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2			1	6
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.2			13.2		44.0	44.0		51.0	51.0	
Effective Green, g (s)		13.2			13.2		44.0	44.0		51.0	51.0	
Actuated g/C Ratio		0.18			0.18		0.59	0.59		0.68	0.68	
Clearance Time (s)		5.4			5.4		5.4	5.4		3.0	5.4	
Vehicle Extension (s)		4.0			4.0		4.0	4.0		3.0	4.0	
Lane Grp Cap (vph)		238			268		589	1083		596	1243	
v/s Ratio Prot							c0.23			0.00	c0.19	
v/s Ratio Perm		c0.05			0.05		0.00			0.05		
v/c Ratio		0.28			0.27		0.01	0.40		0.07	0.29	
Uniform Delay, d1		26.8			26.8		6.4	8.4		4.3	4.8	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.9			0.8		0.0	1.1		0.1	0.6	
Delay (s)		27.6			27.5		6.5	9.5		4.4	5.3	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		27.6			27.5		9.4			5.2		
Approach LOS		C			C		A			A		

Intersection Summary

HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	13.8
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

9: Speers Internal Road 1 & Speers Road

02/28/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕	↕↕	
Traffic Volume (vph)	1360	5	0	850	5	0
Future Volume (vph)	1360	5	0	850	5	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt	0.999					
Flt Protected					0.950	
Satd. Flow (prot)	3606	0	0	3610	1805	0
Flt Permitted	0.950					
Satd. Flow (perm)	3606	0	0	3610	1805	0
Link Speed (k/h)	60		60		20	
Link Distance (m)	147.2		113.4		44.5	
Travel Time (s)	8.8		6.8		8.0	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1388	5	0	867	5	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1393	0	0	867	5	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	14		24		24	
Sign Control	Free		Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	47.8%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

9: Speers Internal Road 1 & Speers Road

02/28/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕	↕↕	
Traffic Volume (veh/h)	1360	5	0	850	5	0
Future Volume (Veh/h)	1360	5	0	850	5	0
Sign Control	Free			Stop		
Grade	0%					
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	1388	5	0	867	5	0
Pedestrians	1			1		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	147			347		
pX, platoon unblocked				0.79	0.81	0.79
vC, conflicting volume				1393	1825	698
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	968			1359		
tC, single (s)	4.1			6.8		
tC, 2 stage (s)						
tF (s)	2.2			3.5		
p0 queue free %	100			96		
cM capacity (veh/h)	569			115		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	925	468	289	578	5
Volume Left	0	0	0	0	5
Volume Right	0	5	0	0	0
cSH	1700	1700	569	1700	115
Volume to Capacity	0.54	0.28	0.00	0.34	0.04
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.0
Control Delay (s)	0.0	0.0	0.0	0.0	37.8
Lane LOS	E				
Approach Delay (s)	0.0		0.0		37.8
Approach LOS	E				

Intersection Summary

Average Delay	0.1
Intersection Capacity Utilization	47.8%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/28/2024

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	0	5	0	0	5	0
Future Volume (vph)	0	5	0	0	5	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected						0.950
Satd. Flow (prot)	1644	0	1900	0	0	1805
Flt Permitted						0.950
Satd. Flow (perm)	1644	0	1900	0	0	1805
Link Speed (k/h)	20		20		20	
Link Distance (m)	34.1		49.5		44.5	
Travel Time (s)	6.1		8.9		8.0	
Confl. Peds. (#/hr)	8					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%					
Adj. Flow (vph)	0	6	0	0	6	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	0	0	0	0	6
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	14	14	24	
Sign Control	Stop		Free		Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	15.7% ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/28/2024

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	0	5	0	0	5	0
Future Volume (Veh/h)	0	5	0	0	5	0
Sign Control	Stop		Free		Free	
Grade	0%					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	6	0	0	6	0
Pedestrians	2					
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0			1		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	14	8	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	14	8	0			
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			100	
cM capacity (veh/h)	1005	1072			1636	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	6	0	6
Volume Left	0	0	6
Volume Right	6	0	0
cSH	1072	1700	1636
Volume to Capacity	0.01	0.00	0.00
Queue Length 95th (m)	0.1	0.0	0.1
Control Delay (s)	8.4	0.0	7.2
Lane LOS	A		A
Approach Delay (s)	8.4	0.0	7.2
Approach LOS	A		

Intersection Summary			
Average Delay	7.8		
Intersection Capacity Utilization	15.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings

11: PUDO + Parking & Speers Internal Road

02/28/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	
Traffic Volume (vph)	5	0	0	5	0	5
Future Volume (vph)	5	0	0	5	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.865	
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1611	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1611	0
Link Speed (k/h)	48			48	48	
Link Distance (m)	34.1			33.7	79.1	
Travel Time (s)	2.6			2.5	5.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	0	0	5	0	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	0	0	5	5	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		97	97		97	97
Sign Control	Stop			Stop	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	13.3%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

11: PUDO + Parking & Speers Internal Road

02/28/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	5	0	0	5	0	5
Future Volume (vph)	5	0	0	5	0	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	0	0	5	0	5
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total (vph)	5	5	5			
Volume Left (vph)	0	0	0			
Volume Right (vph)	0	0	5			
Hadj (s)	0.03	0.03	-0.57			
Departure Headway (s)	3.9	3.9	3.4			
Degree Utilization, x	0.01	0.01	0.00			
Capacity (veh/h)	904	905	1066			
Control Delay (s)	7.0	7.0	6.4			
Approach Delay (s)	7.0	7.0	6.4			
Approach LOS	A	A	A			

Intersection Summary

Delay	6.8
Level of Service	A
Intersection Capacity Utilization	13.3%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings
12: Underground & Speers Internal Road

02/28/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (vph)	10	0	0	0	5	5
Future Volume (vph)	10	0	0	0	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt					0.932	
Flt Protected					0.976	
Satd. Flow (prot)	1900	0	0	1900	1728	0
Flt Permitted					0.976	
Satd. Flow (perm)	1900	0	0	1900	1728	0
Link Speed (k/h)	20			20	20	
Link Distance (m)	33.7			44.6	38.9	
Travel Time (s)	6.1			8.0	7.0	
Confl. Peds. (#/hr)					10	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	13	0	0	0	6	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	0	0	0	12	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	13.3%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
12: Underground & Speers Internal Road

02/28/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (veh/h)	10	0	0	0	5	5
Future Volume (Veh/h)	10	0	0	0	5	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	13	0	0	0	6	6
Pedestrians	10			3		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	1			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			13		23	16
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			13		23	16
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1619		989	1066

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	13	0	12
Volume Left	0	0	6
Volume Right	0	0	6
cSH	1700	1700	1026
Volume to Capacity	0.01	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.3
Control Delay (s)	0.0	0.0	8.5
Lane LOS	A		
Approach Delay (s)	0.0	0.0	8.5
Approach LOS	A		

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings

13: PUDO Exit/Speers Internal Road 2 & Speers Internal Road/30 Speers

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	15	0	0	0	0	20	0	5	0	5	0	0
Future Volume (vph)	15	0	0	0	0	20	0	5	0	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.865											
Flt Protected	0.950										0.950	
Satd. Flow (prot)	0	1504	0	0	1644	0	0	1863	0	0	1805	0
Flt Permitted	0.950										0.950	
Satd. Flow (perm)	0	1504	0	0	1644	0	0	1863	0	0	1805	0
Link Speed (k/h)	20				20				48			
Link Distance (m)	44.6				43.4				79.5			
Travel Time (s)	8.0				7.8				6.0			
Confl. Peds. (#/hr)	2				2				7			
Peak Hour Factor	0.63	0.63	0.92	0.92	0.63	0.63	0.92	0.92	0.92	0.63	0.92	0.63
Heavy Vehicles (%)	20%	0%	2%	2%	0%	0%	2%	2%	2%	0%	2%	12%
Adj. Flow (vph)	24	0	0	0	0	32	0	5	0	8	0	0
Shared Lane Traffic (%)	0											
Lane Group Flow (vph)	0	24	0	0	32	0	0	5	0	0	8	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0											
Link Offset(m)	0.0											
Crosswalk Width(m)	1.6				1.6				1.6			
Two way Left Turn Lane	No											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		97	97		14	97		97	24		14
Sign Control	Stop				Stop				Stop		Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 18.3%

ICU Level of Service A

Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis

13: PUDO Exit/Speers Internal Road 2 & Speers Internal Road/30 Speers

02/28/2024

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (vph)	0	1360	0	5	840	0	10	0	30	0	0	0
Future Volume (vph)	0	1360	0	5	840	0	10	0	30	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.900											
Flt Protected	0.987											
Satd. Flow (prot)	0	3539	0	0	3540	0	0	1688	0	0	1863	0
Flt Permitted	0.987											
Satd. Flow (perm)	0	3539	0	0	3540	0	0	1688	0	0	1863	0
Link Speed (k/h)	60											
Link Distance (m)	113.4			233.1			49.2			39.0		
Travel Time (s)	6.8			14.0			8.9			7.0		
Confl. Peds. (#/hr)	8			8								
Confl. Bikes (#/hr)	1											
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	2%	0%	2%	2%	2%
Adj. Flow (vph)	0	1432	0	5	884	0	11	0	32	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1432	0	0	889	0	0	43	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.6			3.6			0.0					
Link Offset(m)	0.0											
Crosswalk Width(m)	1.6			1.6			1.6					
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14		24		14		24		14	
Sign Control	Free			Free			Stop			Stop		

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	47.6%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (veh/h)	0	1360	0	5	840	0	10	0	30	0	0	0
Future Volume (Veh/h)	0	1360	0	5	840	0	10	0	30	0	0	0
Sign Control	Free			Free			Stop			Stop		
Grade	0%											
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Hourly flow rate (vph)	0	1432	0	5	884	0	11	0	32	0	0	0
Pedestrians	4											
Lane Width (m)	3.6			3.6			3.6					
Walking Speed (m/s)	1.1			1.1			1.1					
Percent Blockage	0											
Right turn flare (veh)	1											
Median type	None											
Median storage (veh)												
Upstream signal (m)	261			233								
pX, platoon unblocked	0.95			0.80			0.83			0.83		
vC, conflicting volume	884			1440			1896			2334		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	774			1057			1397			1927		
tC, single (s)	4.1			4.1			7.5			6.5		
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5			4.0		
p0 queue free %	100			99			87			100		
cM capacity (veh/h)	796			531			83			54		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	955	477	300	589	43	0
Volume Left	0	0	5	0	11	0
Volume Right	0	0	0	0	32	0
cSH	1700	1700	531	1700	238	1700
Volume to Capacity	0.56	0.28	0.01	0.35	0.18	0.00
Queue Length 95th (m)	0.0	0.0	0.2	0.0	4.9	0.0
Control Delay (s)	0.0	0.0	0.3	0.0	23.4	0.0
Lane LOS	A		C		A	
Approach Delay (s)	0.0		0.1		23.4	
Approach LOS	C		A			

Intersection Summary

Average Delay	0.5
Intersection Capacity Utilization	47.6%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	65	575	135	295	815	505	140	155	230	280	285	60
Future Volume (vph)	65	575	135	295	815	505	140	155	230	280	285	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	105.0		0.0	75.0		100.0	50.0		45.0	80.0		75.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor	0.99		0.97	1.00		0.94	0.97		0.93	0.93		0.93
Frt		0.850				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3539	1615	1752	3539	1583	1787	1900	1599	3467	1900	1615
Flt Permitted	0.290			0.336			0.309			0.521		
Satd. Flow (perm)	546	3539	1560	617	3539	1485	562	1900	1486	1770	1900	1501
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			142			532			242			81
Link Speed (k/h)		60			60			50				50
Link Distance (m)		235.8			147.2			127.4				167.2
Travel Time (s)		14.1			8.8			9.2				12.0
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Adj. Flow (vph)	68	605	142	311	858	532	147	163	242	295	300	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	68	605	142	311	858	532	147	163	242	295	300	63
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			7.2				7.2
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		1.6			1.6			1.6				1.6
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

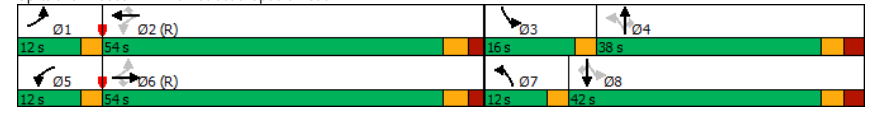
Lanes, Volumes, Timings
1: Kerr Street & Speers Road

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Detector Phase	1	6	6	5	2	2	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	7.0	25.0	25.0	7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	10.0	30.9	30.9	10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3	34.3
Total Split (s)	12.0	54.0	54.0	12.0	54.0	54.0	12.0	38.0	38.0	16.0	42.0	42.0
Total Split (%)	10.0%	45.0%	45.0%	10.0%	45.0%	45.0%	10.0%	31.7%	31.7%	13.3%	35.0%	35.0%
Maximum Green (s)	9.0	48.1	48.1	9.0	48.1	48.1	9.0	31.7	31.7	13.0	35.7	35.7
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	0.0	2.2	2.2	0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.5	5.5	5.5	2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	4.0
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		14.0	14.0		14.0	14.0		14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		15	15		15	15		35	35		35	35
Act Effect Green (s)	63.4	53.0	53.0	72.5	61.2	61.2	36.6	23.4	23.4	39.8	25.2	25.2
Actuated g/C Ratio	0.53	0.44	0.44	0.60	0.51	0.51	0.30	0.20	0.20	0.33	0.21	0.21
v/c Ratio	0.19	0.39	0.18	0.62	0.48	0.52	0.54	0.44	0.50	0.39	0.75	0.17
Control Delay	12.8	24.6	4.3	19.3	21.8	3.8	35.1	45.5	8.5	28.9	56.0	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	24.6	4.3	19.3	21.8	3.8	35.1	45.5	8.5	28.9	56.0	5.4
LOS	B	C	A	B	C	A	D	D	A	C	E	A
Approach Delay		20.1			15.7			26.5				39.0
Approach LOS		C			B			C				D

Intersection Summary	
Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	49 (41%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.75
Intersection Signal Delay:	22.4
Intersection Capacity Utilization:	78.5%
Analysis Period (min):	15
Intersection LOS:	C
ICU Level of Service:	D

Splits and Phases: 1: Kerr Street & Speers Road



Timings
1: Kerr Street & Speers Road

02/28/2024

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↖↖	↘	↘	↖↖	↘	↖	↖	↖	↘↘	↖	↘
Traffic Volume (vph)	65	575	135	295	815	505	140	155	230	280	285	60
Future Volume (vph)	65	575	135	295	815	505	140	155	230	280	285	60
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Detector Phase	1	6	6	5	2	2	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	7.0	25.0	25.0	7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	10.0	30.9	30.9	10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3	34.3
Total Split (s)	12.0	54.0	54.0	12.0	54.0	54.0	12.0	38.0	38.0	16.0	42.0	42.0
Total Split (%)	10.0%	45.0%	45.0%	10.0%	45.0%	45.0%	10.0%	31.7%	31.7%	13.3%	35.0%	35.0%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	0.0	2.2	2.2	0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
Act Effect Green (s)	63.4	53.0	53.0	72.5	61.2	61.2	36.6	23.4	23.4	39.8	25.2	25.2
Actuated g/C Ratio	0.53	0.44	0.44	0.60	0.51	0.51	0.30	0.20	0.20	0.33	0.21	0.21
v/c Ratio	0.19	0.39	0.18	0.62	0.48	0.52	0.54	0.44	0.50	0.39	0.75	0.17
Control Delay	12.8	24.6	4.3	19.3	21.8	3.8	35.1	45.5	8.5	28.9	56.0	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	24.6	4.3	19.3	21.8	3.8	35.1	45.5	8.5	28.9	56.0	5.4
LOS	B	C	A	B	C	A	D	D	A	C	E	A
Approach Delay		20.1			15.7			26.5			39.0	
Approach LOS		C			B			C			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 49 (41%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.75
 Intersection Signal Delay: 22.4 Intersection LOS: C
 Intersection Capacity Utilization 78.5% ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 1: Kerr Street & Speers Road



Queues
1: Kerr Street & Speers Road

02/28/2024

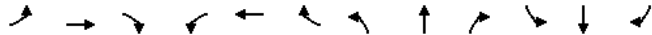
	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	68	605	142	311	858	532	147	163	242	295	300	63
v/c Ratio	0.19	0.39	0.18	0.62	0.48	0.52	0.54	0.44	0.50	0.39	0.75	0.17
Control Delay	12.8	24.6	4.3	19.3	21.8	3.8	35.1	45.5	8.5	28.9	56.0	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	24.6	4.3	19.3	21.8	3.8	35.1	45.5	8.5	28.9	56.0	5.4
Queue Length 50th (m)	6.5	53.6	0.0	34.9	71.2	0.0	23.8	33.3	0.0	24.6	66.8	0.0
Queue Length 95th (m)	14.1	69.0	12.1	57.1	99.5	20.4	36.5	51.5	19.8	32.6	89.2	7.2
Internal Link Dist (m)		211.8			123.2		103.4			143.2		
Turn Bay Length (m)	105.0			75.0		100.0	50.0		45.0	80.0		75.0
Base Capacity (vph)	389	1564	769	502	1804	1017	274	501	570	785	565	503
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.39	0.18	0.62	0.48	0.52	0.54	0.33	0.42	0.38	0.53	0.13

Intersection Summary

HCM Signalized Intersection Capacity Analysis

1: Kerr Street & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔↔	↔	↔
Traffic Volume (vph)	65	575	135	295	815	505	140	155	230	280	285	60
Future Volume (vph)	65	575	135	295	815	505	140	155	230	280	285	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.94	1.00	1.00	0.93	1.00	1.00	0.93
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1799	3539	1560	1750	3539	1485	1773	1900	1486	3347	1900	1501
Flt Permitted	0.29	1.00	1.00	0.34	1.00	1.00	0.31	1.00	1.00	0.52	1.00	1.00
Satd. Flow (perm)	549	3539	1560	619	3539	1485	577	1900	1486	1835	1900	1501
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	68	605	142	311	858	532	147	163	242	295	300	63
RTOR Reduction (vph)	0	0	79	0	0	263	0	0	195	0	0	50
Lane Group Flow (vph)	68	605	63	311	858	269	147	163	47	295	300	13
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Actuated Green, G (s)	59.1	53.0	53.0	69.7	60.6	60.6	33.3	23.4	23.4	36.9	25.2	25.2
Effective Green, g (s)	59.1	53.0	53.0	69.7	60.6	60.6	33.3	23.4	23.4	36.9	25.2	25.2
Actuated g/C Ratio	0.49	0.44	0.44	0.58	0.51	0.51	0.28	0.19	0.19	0.31	0.21	0.21
Clearance Time (s)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Vehicle Extension (s)	2.5	5.5	5.5	2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	333	1563	689	488	1787	749	258	370	289	711	399	315
v/s Ratio Prot	0.01	0.17		c0.07	0.24		c0.05	0.09		c0.04	c0.16	
v/s Ratio Perm	0.09		0.04	c0.30		0.18	0.11		0.03	0.09		0.01
v/c Ratio	0.20	0.39	0.09	0.64	0.48	0.36	0.57	0.44	0.16	0.41	0.75	0.04
Uniform Delay, d1	16.3	22.6	19.5	13.7	19.4	18.0	34.7	42.5	40.2	31.7	44.5	37.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.7	0.3	2.4	0.9	1.3	2.3	1.1	0.4	0.3	8.3	0.1
Delay (s)	16.5	23.3	19.7	16.1	20.3	19.3	37.1	43.7	40.5	32.0	52.7	37.9
Level of Service	B	C	B	B	C	B	D	D	D	C	D	D
Approach Delay (s)		22.1			19.2			40.5			42.0	
Approach LOS		C			B			D			D	

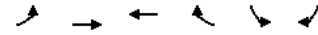
Intersection Summary		
HCM 2000 Control Delay	27.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.68	
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	78.5%	ICU Level of Service
Analysis Period (min)	15	

c Critical Lane Group

Lanes, Volumes, Timings

2: Speers Road & Cross Avenue

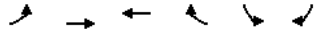
02/28/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔↔	↔	↔	↔	↔
Traffic Volume (vph)	260	815	1190	15	10	420
Future Volume (vph)	260	815	1190	15	10	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	80.0			0.0	45.0	0.0
Storage Lanes	1			0	1	2
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	0.88
Ped Bike Factor	1.00		1.00			
Frt			0.998			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1703	3610	3566	0	1805	2733
Flt Permitted	0.154				0.950	
Satd. Flow (perm)	276	3610	3566	0	1805	2733
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			1			321
Link Speed (k/h)		60	60		48	
Link Distance (m)		233.1	101.5		84.0	
Travel Time (s)		14.0	6.1		6.3	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Adj. Flow (vph)	271	849	1240	16	10	438
Shared Lane Traffic (%)						
Lane Group Flow (vph)	271	849	1256	0	10	438
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
2: Speers Road & Cross Avenue

02/28/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Detector Phase	5	2	6		4	4
Switch Phase						
Minimum Initial (s)	6.0	38.0	38.0		10.0	10.0
Minimum Split (s)	12.0	47.6	47.6		15.8	15.8
Total Split (s)	17.0	102.0	85.0		38.0	38.0
Total Split (%)	12.1%	72.9%	60.7%		27.1%	27.1%
Maximum Green (s)	11.0	95.4	78.4		32.2	32.2
Yellow Time (s)	4.0	3.7	3.7		3.3	3.3
All-Red Time (s)	2.0	2.9	2.9		2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6		5.8	5.8
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Recall Mode	None	C-Min	C-Min		None	None
Walk Time (s)		10.0	10.0			
Flash Dont Walk (s)		31.0	31.0			
Pedestrian Calls (#/hr)		5	5			
Act Effect Green (s)	114.6	114.0	88.9		13.6	13.6
Actuated g/C Ratio	0.82	0.81	0.64		0.10	0.10
v/c Ratio	0.64	0.29	0.55		0.06	0.79
Control Delay	15.9	3.7	16.6		55.2	27.3
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	15.9	3.7	16.6		55.2	27.3
LOS	B	A	B		E	C
Approach Delay		6.6	16.6		27.9	
Approach LOS		A	B		C	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 13 (9%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 14.4 Intersection LOS: B
 Intersection Capacity Utilization 72.2% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: Speers Road & Cross Avenue



Timings
2: Speers Road & Cross Avenue

02/28/2024

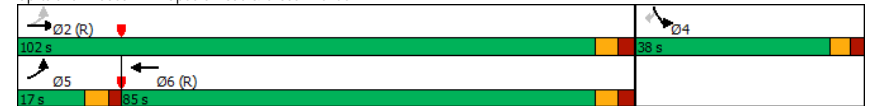


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↕↕	↕↕	↔	↕↕
Traffic Volume (vph)	260	815	1190	10	420
Future Volume (vph)	260	815	1190	10	420
Turn Type	pm+pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2				4
Detector Phase	5	2	6	4	4
Switch Phase					
Minimum Initial (s)	6.0	38.0	38.0	10.0	10.0
Minimum Split (s)	12.0	47.6	47.6	15.8	15.8
Total Split (s)	17.0	102.0	85.0	38.0	38.0
Total Split (%)	12.1%	72.9%	60.7%	27.1%	27.1%
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	None	None
Act Effect Green (s)	114.6	114.0	88.9	13.6	13.6
Actuated g/C Ratio	0.82	0.81	0.64	0.10	0.10
v/c Ratio	0.64	0.29	0.55	0.06	0.79
Control Delay	15.9	3.7	16.6	55.2	27.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.9	3.7	16.6	55.2	27.3
LOS	B	A	B	E	C
Approach Delay		6.6	16.6	27.9	
Approach LOS		A	B	C	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 13 (9%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 14.4 Intersection LOS: B
 Intersection Capacity Utilization 72.2% ICU Level of Service C
 Analysis Period (min) 15

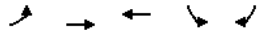
Splits and Phases: 2: Speers Road & Cross Avenue



Queues

2: Speers Road & Cross Avenue

02/28/2024



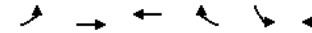
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	271	849	1256	10	438
w/c Ratio	0.64	0.29	0.55	0.06	0.79
Control Delay	15.9	3.7	16.6	55.2	27.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.9	3.7	16.6	55.2	27.3
Queue Length 50th (m)	12.3	23.0	92.0	2.6	17.8
Queue Length 95th (m)	46.1	39.7	145.1	7.8	36.6
Internal Link Dist (m)		209.1	77.5	60.0	
Turn Bay Length (m)	80.0		45.0		
Base Capacity (vph)	421	2940	2270	415	875
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.64	0.29	0.55	0.02	0.50

Intersection Summary

HCM Signalized Intersection Capacity Analysis

2: Speers Road & Cross Avenue

02/28/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕↕	↕↕		↔	↕↕
Traffic Volume (vph)	260	815	1190	15	10	420
Future Volume (vph)	260	815	1190	15	10	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.6	6.6		5.8	5.8
Lane Util. Factor	1.00	0.95	0.95		1.00	0.88
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1703	3610	3567		1805	2733
Flt Permitted	0.15	1.00	1.00		0.95	1.00
Satd. Flow (perm)	276	3610	3567		1805	2733
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	271	849	1240	16	10	438
RTOR Reduction (vph)	0	0	0	0	0	290
Lane Group Flow (vph)	271	849	1256	0	10	148
Confl. Peds. (#/hr)	5			5		
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	114.0	114.0	88.9		13.6	13.6
Effective Green, g (s)	114.0	114.0	88.9		13.6	13.6
Actuated g/C Ratio	0.81	0.81	0.64		0.10	0.10
Clearance Time (s)	6.0	6.6	6.6		5.8	5.8
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Lane Grp Cap (vph)	419	2939	2265		175	265
v/s Ratio Prot	c0.09	0.24	0.35		0.01	
v/s Ratio Perm	c0.44					c0.05
w/c Ratio	0.65	0.29	0.55		0.06	0.56
Uniform Delay, d1	12.3	3.2	14.4		57.4	60.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.6	0.2	1.0		0.1	2.6
Delay (s)	15.9	3.4	15.4		57.5	62.9
Level of Service	B	A	B		E	E
Approach Delay (s)		6.4	15.4		62.8	
Approach LOS		A	B		E	

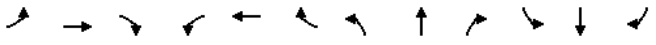
Intersection Summary

HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
3: St. Augustine Drive & Speers Road

02/28/2024




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕			↕				↕		↕	
Traffic Volume (vph)	10	740	25	0	995	25	5	0	25	5	0	0
Future Volume (vph)	10	740	25	0	995	25	5	0	25	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0			0			1			0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995			0.996				0.865			
Flt Protected	0.950						0.950				0.950	
Satd. Flow (prot)	1805	3553	0	0	3561	0	0	0	1644	0	1805	0
Flt Permitted	0.950						0.950				0.950	
Satd. Flow (perm)	1805	3553	0	0	3561	0	0	0	1644	0	1805	0
Link Speed (k/h)		60			60				40			30
Link Distance (m)		248.1			235.8				188.1			117.6
Travel Time (s)		14.9			14.1				16.9			14.1
Confl. Peds. (#/hr)	8		5	5		8	1		1	1		1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	10	771	26	0	1036	26	5	0	26	5	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	797	0	0	1062	0	0	5	26	0	5	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6				0.0			0.0
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		1.6			1.6				1.6			1.6
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free				Stop			Stop

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
3: St. Augustine Drive & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕			↕				↕		↕	
Traffic Volume (veh/h)	10	740	25	0	995	25	5	0	25	5	0	0
Future Volume (Veh/h)	10	740	25	0	995	25	5	0	25	5	0	0
Sign Control		Free			Free				Stop			Stop
Grade		0%			0%				0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	10	771	26	0	1036	26	5	0	26	5	0	0
Pedestrians		1			1				5			8
Lane Width (m)		3.6			3.6				3.6			3.6
Walking Speed (m/s)		1.1			1.1				1.1			1.1
Percent Blockage		0			0				0			1
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)					236							
pX, platoon unblocked	0.84						0.84	0.84		0.84	0.84	0.84
vC, conflicting volume	1070				802		1328	1879	404	1490	1879	540
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	708				802		1014	1669	404	1206	1669	78
tC, single (s)	4.1				4.1		7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2				2.2		3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99				100		97	100	96	95	100	100
cM capacity (veh/h)	752				827		161	80	598	111	80	813
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1					
Volume Total	10	514	283	691	371	31	5					
Volume Left	10	0	0	0	0	5	5					
Volume Right	0	0	26	0	26	26	0					
cSH	752	1700	1700	1700	1700	416	111					
Volume to Capacity	0.01	0.30	0.17	0.41	0.22	0.07	0.05					
Queue Length 95th (m)	0.3	0.0	0.0	0.0	0.0	1.8	1.1					
Control Delay (s)	9.8	0.0	0.0	0.0	0.0	14.4	39.0					
Lane LOS	A					B	E					
Approach Delay (s)	0.1				0.0	14.4	39.0					
Approach LOS						B	E					
Intersection Summary												
Average Delay					0.4							
Intersection Capacity Utilization					Err%	ICU Level of Service				H		
Analysis Period (min)					15							

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

02/28/2024

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙		↑	↗	↘	↓
Traffic Volume (vph)	95	150	595	125	170	530
Future Volume (vph)	95	150	595	125	170	530
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0	0.0		50.0	50.0	
Storage Lanes	0	0		1	1	
Taper Length (m)	2.5			2.5		
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor	0.98			0.97	1.00	
Frt	0.917			0.850		
Flt Protected	0.981			0.950		
Satd. Flow (prot)	1661	0	3574	1583	1805	3574
Flt Permitted	0.981			0.305		
Satd. Flow (perm)	1653	0	3574	1540	578	3574
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	96			129		
Link Speed (k/h)	50		50		50	
Link Distance (m)	265.3		167.2		94.4	
Travel Time (s)	19.1		12.0		6.8	
Confl. Peds. (#/hr)	13	6		4	4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	1%	1%	2%	0%	1%
Adj. Flow (vph)	98	155	613	129	175	546
Shared Lane Traffic (%)						
Lane Group Flow (vph)	253	0	613	129	175	546
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1		2	1	1	2
Detector Template	Left		Thru	Right	Left	Thru
Leading Detector (m)	2.0		10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0		0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4		9.4	
Detector 2 Size(m)			0.6		0.6	
Detector 2 Type			Cl+Ex		Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)			0.0		0.0	

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

02/28/2024

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Prot		NA	Perm	pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases				2	6	
Detector Phase	3		2	2	1	6
Switch Phase						
Minimum Initial (s)	10.0		18.0	18.0	7.0	18.0
Minimum Split (s)	31.4		28.2	28.2	11.0	28.2
Total Split (s)	32.0		40.0	40.0	14.0	54.0
Total Split (%)	37.2%		46.5%	46.5%	16.3%	62.8%
Maximum Green (s)	26.6		34.8	34.8	10.0	48.8
Yellow Time (s)	3.3		3.3	3.3	4.0	3.3
All-Red Time (s)	2.1		1.9	1.9	0.0	1.9
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4		5.2	5.2	4.0	5.2
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0		3.5	3.5	2.5	3.5
Recall Mode	None		Min	Min	None	Min
Walk Time (s)	10.0		10.0	10.0		10.0
Flash Dont Walk (s)	16.0		13.0	13.0		13.0
Pedestrian Calls (#/hr)	0		5	5		5
Act Effect Green (s)	12.0		19.1	19.1	32.2	31.0
Actuated g/C Ratio	0.22		0.36	0.36	0.60	0.58
v/c Ratio	0.57		0.48	0.21	0.33	0.26
Control Delay	17.3		15.6	4.2	7.0	6.3
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	17.3		15.6	4.2	7.0	6.3
LOS	B		B	A	A	A
Approach Delay	17.3		13.6			6.5
Approach LOS	B		B			A

Intersection Summary	
Area Type:	Other
Cycle Length:	86
Actuated Cycle Length:	53.7
Natural Cycle:	75
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.57
Intersection Signal Delay:	11.2
Intersection Capacity Utilization:	54.5%
Intersection LOS:	B
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 4: Kerr Street & Shepherd Road



Timings
4: Kerr Street & Shepherd Road

02/28/2024

	↙	↑	↘	↙	↓
Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Configurations	↘ ↙	↑↑	↘ ↙	↘ ↙	↑↑
Traffic Volume (vph)	95	595	125	170	530
Future Volume (vph)	95	595	125	170	530
Turn Type	Prot	NA	Perm	pm+pt	NA
Protected Phases	3	2		1	6
Permitted Phases			2	6	
Detector Phase	3	2	2	1	6
Switch Phase					
Minimum Initial (s)	10.0	18.0	18.0	7.0	18.0
Minimum Split (s)	31.4	28.2	28.2	11.0	28.2
Total Split (s)	32.0	40.0	40.0	14.0	54.0
Total Split (%)	37.2%	46.5%	46.5%	16.3%	62.8%
Yellow Time (s)	3.3	3.3	3.3	4.0	3.3
All-Red Time (s)	2.1	1.9	1.9	0.0	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	5.2	5.2	4.0	5.2
Lead/Lag		Lag	Lag	Lead	Lead
Lead-Lag Optimize?		Yes	Yes	Yes	
Recall Mode	None	Min	Min	None	Min
Act Effect Green (s)	12.0	19.1	19.1	32.2	31.0
Actuated g/C Ratio	0.22	0.36	0.36	0.60	0.58
v/c Ratio	0.57	0.48	0.21	0.33	0.26
Control Delay	17.3	15.6	4.2	7.0	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.3	15.6	4.2	7.0	6.3
LOS	B	B	A	A	A
Approach Delay	17.3	13.6			6.5
Approach LOS	B	B			A

Intersection Summary

Cycle Length: 86
 Actuated Cycle Length: 53.7
 Natural Cycle: 75
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.57
 Intersection Signal Delay: 11.2
 Intersection Capacity Utilization 54.5%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 4: Kerr Street & Shepherd Road



Queues
4: Kerr Street & Shepherd Road

02/28/2024

	↙	↑	↘	↙	↓
Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	253	613	129	175	546
v/c Ratio	0.57	0.48	0.21	0.33	0.26
Control Delay	17.3	15.6	4.2	7.0	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.3	15.6	4.2	7.0	6.3
Queue Length 50th (m)	12.4	21.6	0.0	5.7	10.7
Queue Length 95th (m)	34.0	42.6	9.2	15.8	22.9
Internal Link Dist (m)	241.3	143.2			70.4
Turn Bay Length (m)	30.0		50.0	50.0	
Base Capacity (vph)	879	2342	1053	578	3353
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.29	0.26	0.12	0.30	0.16

Intersection Summary

HCM Signalized Intersection Capacity Analysis

4: Kerr Street & Shepherd Road

02/28/2024

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↑↑	↔	↔	↑↑
Traffic Volume (vph)	95	150	595	125	170	530
Future Volume (vph)	95	150	595	125	170	530
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4		5.2	5.2	4.0	5.2
Lane Util. Factor	1.00		0.95	1.00	1.00	0.95
Flpb, ped/bikes	0.99		1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.92		1.00	0.85	1.00	1.00
Flt Protected	0.98		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1664		3574	1544	1804	3574
Flt Permitted	0.98		1.00	1.00	0.30	1.00
Satd. Flow (perm)	1664		3574	1544	579	3574
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	98	155	613	129	175	546
RTOR Reduction (vph)	75	0	0	83	0	0
Lane Group Flow (vph)	178	0	613	46	175	546
Confl. Peds. (#/hr)	13	6		4	4	
Heavy Vehicles (%)	3%	1%	1%	2%	0%	1%
Turn Type	Prot		NA	Perm	pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases				2	6	
Actuated Green, G (s)	12.0		19.1	19.1	31.0	31.0
Effective Green, g (s)	12.0		19.1	19.1	31.0	31.0
Actuated g/C Ratio	0.22		0.36	0.36	0.58	0.58
Clearance Time (s)	5.4		5.2	5.2	4.0	5.2
Vehicle Extension (s)	3.0		3.5	3.5	2.5	3.5
Lane Grp Cap (vph)	372		1273	550	515	2067
v/s Ratio Prot	c0.11		c0.17		c0.05	0.15
v/s Ratio Perm				0.03	0.15	
v/c Ratio	0.48		0.48	0.08	0.34	0.26
Uniform Delay, d1	18.1		13.4	11.4	5.8	5.6
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0		0.3	0.1	0.3	0.1
Delay (s)	19.1		13.7	11.5	6.0	5.7
Level of Service	B		B	B	A	A
Approach Delay (s)	19.1		13.4			5.8
Approach LOS	B		B			A

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	53.6	Sum of lost time (s)	14.6
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

5: Kerr Street & Wycroft Road

02/28/2024

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↑↑	↑↑	↔
Traffic Volume (vph)	25	130	115	630	570	110
Future Volume (vph)	25	130	115	630	570	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	75.0	0.0	75.0			0.0
Storage Lanes	1	1	1			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850			0.976	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1553	1703	3610	3501	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1553	1703	3610	3501	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	561.6			394.3	98.1	
Travel Time (s)	40.4			28.4	7.1	
Confl. Peds. (#/hr)			5			5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	4%	6%	0%	0%	4%
Adj. Flow (vph)	27	138	122	670	606	117
Shared Lane Traffic (%)						
Lane Group Flow (vph)	27	138	122	670	723	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	39.1%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

5: Kerr Street & Wycroft Road

02/28/2024

Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Volume (veh/h)	25	130	115	630	570	110	
Future Volume (Veh/h)	25	130	115	630	570	110	
Sign Control	Stop		Free				
Grade	0%		0%				
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	
Hourly flow rate (vph)	27	138	122	670	606	117	
Pedestrians	5						
Lane Width (m)	3.6						
Walking Speed (m/s)	1.1						
Percent Blockage	0						
Right turn flare (veh)							
Median type			None		None		
Median storage (veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	1248	366	728				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1248	366	728				
tC, single (s)	6.8	7.0	4.2				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.3				
p0 queue free %	81	78	86				
cM capacity (veh/h)	143	622	842				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	27	138	122	335	335	404	319
Volume Left	27	0	122	0	0	0	0
Volume Right	0	138	0	0	0	0	117
cSH	143	622	842	1700	1700	1700	1700
Volume to Capacity	0.19	0.22	0.14	0.20	0.20	0.24	0.19
Queue Length 95th (m)	5.1	6.4	3.8	0.0	0.0	0.0	0.0
Control Delay (s)	35.9	12.4	10.0	0.0	0.0	0.0	0.0
Lane LOS	E	B	B				
Approach Delay (s)	16.3		1.5	0.0			
Approach LOS	C						
Intersection Summary							
Average Delay	2.3						
Intersection Capacity Utilization	39.1%		ICU Level of Service			A	
Analysis Period (min)	15						

Lanes, Volumes, Timings

6: Kerr Street & Prince Charles Drive

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	10	0	10	10	0	30	5	490	10	20	665	25	
Future Volume (vph)	10	0	10	10	0	30	5	490	10	20	665	25	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt	0.932		0.900		0.997		0.995						
Flt Protected	0.976		0.987		0.999								
Satd. Flow (prot)	0	1728	0	0	1688	0	0	1873	0	0	1849	0	
Flt Permitted	0.976		0.987		0.999								
Satd. Flow (perm)	0	1728	0	0	1688	0	0	1873	0	0	1849	0	
Link Speed (k/h)	40		40		50		50						
Link Distance (m)	57.8		56.0		134.8		127.4						
Travel Time (s)	5.2		5.0		9.7		9.2						
Confl. Peds. (#/hr)	4		1	1		4	21		31	31		21	
Confl. Bikes (#/hr)									1				
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Heavy Vehicles (%)	0%	50%	0%	0%	0%	0%	20%	1%	0%	5%	2%	4%	
Adj. Flow (vph)	11	0	11	11	0	32	5	516	11	21	700	26	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	22	0	0	43	0	0	532	0	0	747	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)	0.0		0.0		0.0		0.0		3.6				
Link Offset(m)	0.0		0.0		0.0		0.0		0.0				
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6				
Two way Left Turn Lane													
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (k/h)	24		14	24		14	24		14	24		14	
Sign Control	Stop		Stop		Free		Free		Free				
Intersection Summary													
Area Type:	Other												
Control Type:	Unsignalized												
Intersection Capacity Utilization	60.4%						ICU Level of Service B						
Analysis Period (min)	15												

HCM Unsignalized Intersection Capacity Analysis

6: Kerr Street & Prince Charles Drive

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	10	0	10	10	0	30	5	490	10	20	665	25
Future Volume (Veh/h)	10	0	10	10	0	30	5	490	10	20	665	25
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	0	11	11	0	32	5	516	11	21	700	26
Pedestrians	21			31			1			4		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	2			3			0			0		
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (m)							238					
pX, platoon unblocked	0.79	0.79	0.75	0.79	0.79	0.91	0.75					0.91
vC, conflicting volume	1344	1344	735	1330	1352	556	747					558
vC1, stage 1 conf vol												
vC2, stage 2 conf vol	1038	1038	477	1020	1048	459	493					461
tC, single (s)	7.1	7.0	6.2	7.1	6.5	6.2	4.3					4.1
tC, 2 stage (s)												
tF (s)	3.5	4.5	3.3	3.5	4.0	3.3	2.4					2.2
p0 queue free %	92	100	97	93	100	94	99					98
cM capacity (veh/h)	145	140	434	154	169	532	721					955
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	22	43	532	747								
Volume Left	11	11	5	21								
Volume Right	11	32	11	26								
cSH	218	327	721	955								
Volume to Capacity	0.10	0.13	0.01	0.02								
Queue Length 95th (m)	2.5	3.4	0.2	0.5								
Control Delay (s)	23.4	17.7	0.2	0.6								
Lane LOS	C	C	A	A								
Approach Delay (s)	23.4	17.7	0.2	0.6								
Approach LOS	C	C										
Intersection Summary												
Average Delay	1.3											
Intersection Capacity Utilization	60.4%			ICU Level of Service			B					
Analysis Period (min)	15											

Lanes, Volumes, Timings

7: Kerr Street & Elmwood Road

02/28/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	15	10	5	490	645	40
Future Volume (vph)	15	10	5	490	645	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.945		0.992			
Fit Protected	0.971					
Satd. Flow (prot)	1675	0	0	1860	1843	0
Fit Permitted	0.971					
Satd. Flow (perm)	1675	0	0	1860	1843	0
Link Speed (k/h)	40		50			
Link Distance (m)	171.2		103.0		134.8	
Travel Time (s)	15.4		7.4		9.7	
Confl. Peds. (#/hr)	1	2	34	34		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	10%	20%	2%	2%	7%
Adj. Flow (vph)	16	11	5	516	679	42
Shared Lane Traffic (%)						
Lane Group Flow (vph)	27	0	0	521	721	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6		3.6			
Link Offset(m)	0.0		0.0			
Crosswalk Width(m)	1.6		1.6			
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24	14		
Sign Control	Stop			Free		
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	47.2%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

7: Kerr Street & Elmwood Road

02/28/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↕		↔	
Traffic Volume (veh/h)	15	10	5	490	645	40
Future Volume (Veh/h)	15	10	5	490	645	40
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	11	5	516	679	42
Pedestrians	34		2		1	
Lane Width (m)	3.6		3.6		3.6	
Walking Speed (m/s)	1.1		1.1		1.1	
Percent Blockage	3		0		0	
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)			103		262	
pX, platoon unblocked	0.84	0.78	0.78			
vC, conflicting volume	1261	736	755			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	899	516	541			
tC, single (s)	6.4	6.3	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.4			
p0 queue free %	94	97	99			
cM capacity (veh/h)	251	408	710			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	27	521	721			
Volume Left	16	5	0			
Volume Right	11	0	42			
cSH	297	710	1700			
Volume to Capacity	0.09	0.01	0.42			
Queue Length 95th (m)	2.3	0.2	0.0			
Control Delay (s)	18.3	0.2	0.0			
Lane LOS	C	A				
Approach Delay (s)	18.3	0.2	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			47.2%		ICU Level of Service A	
Analysis Period (min)	15					

Lanes, Volumes, Timings

8: Kerr Street & Stewart Street

02/28/2024



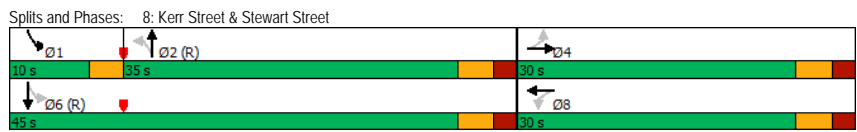
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↕		↕		↕		↕		↕	
Traffic Volume (vph)	50	10	15	10	15	75	10	370	15	55	550	50
Future Volume (vph)	50	10	15	10	15	75	10	370	15	55	550	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0		0.0		20.0		0.0		20.0	
Storage Lanes	0		0		0		1		0		1	
Taper Length (m)	2.5		2.5		2.5		2.5		2.5		2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.97		0.96		0.96		0.98		1.00		0.98	
Frt	0.973		0.898		0.994		0.988		0.988		0.988	
Flt Protected	0.968		0.995		0.950		0.950		0.950		0.950	
Satd. Flow (prot)	0	1705	0	0	1577	0	1805	1854	0	1787	1832	0
Flt Permitted	0.771		0.967		0.407		0.440		0.440		0.440	
Satd. Flow (perm)	0	1333	0	0	1530	0	758	1854	0	814	1832	0
Right Turn on Red			Yes		Yes		Yes		Yes		Yes	
Satd. Flow (RTOR)	16		82		3		9		9		9	
Link Speed (k/h)	40		40		50		50		50		50	
Link Distance (m)	95.6		60.6		165.0		103.0		103.0		103.0	
Travel Time (s)	8.6		5.5		11.9		7.4		7.4		7.4	
Confl. Peds. (#/hr)	20		15		15		20		35		25	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Adj. Flow (vph)	54	11	16	11	16	82	11	402	16	60	598	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	81	0	0	109	0	11	418	0	60	652	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0		0.0		3.6		3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6		1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24	14	24	14	24	14	24	14	24	14
Number of Detectors	1	2	1	2	1	2	1	2	1	2	1	2
Detector Template	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left	Thru
Leading Detector (m)	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4		9.4		9.4		9.4		9.4		9.4	
Detector 2 Size(m)	0.6		0.6		0.6		0.6		0.6		0.6	
Detector 2 Type	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0		0.0		0.0		0.0		0.0		0.0	

Lanes, Volumes, Timings
8: Kerr Street & Stewart Street

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		24.0	24.0		6.0	24.0	
Minimum Split (s)	30.0	30.0		30.0	30.0		32.0	32.0		10.0	32.0	
Total Split (s)	30.0	30.0		30.0	30.0		35.0	35.0		10.0	45.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		46.7%	46.7%		13.3%	60.0%	
Maximum Green (s)	24.6	24.6		24.6	24.6		29.6	29.6		7.0	39.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.0	3.3	
All-Red Time (s)	2.1	2.1		2.1	2.1		2.1	2.1		0.0	2.1	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.4			5.4		5.4	5.4		3.0	5.4	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
Recall Mode	None	None		None	None		C-Min	C-Min		None	C-Min	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0		
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		14.0	14.0		14.0		
Pedestrian Calls (#/hr)	20	20		20	20		35	35		35		
Act Effect Green (s)		15.2			15.2		47.1	47.1		54.5	53.2	
Actuated g/C Ratio		0.20			0.20		0.63	0.63		0.73	0.71	
v/c Ratio		0.29			0.29		0.02	0.36		0.09	0.50	
Control Delay		21.5			9.9		12.7	12.6		5.9	9.7	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		21.5			9.9		12.7	12.6		5.9	9.7	
LOS		C			A		B	B		A	A	
Approach Delay		21.5			9.9		12.7			9.4		
Approach LOS		C			A		B			A		

Intersection Summary	
Area Type:	Other
Cycle Length:	75
Actuated Cycle Length:	75
Offset:	13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	75
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.50
Intersection Signal Delay:	11.2
Intersection Capacity Utilization:	69.0%
ICU Level of Service:	C
Intersection LOS:	B
Analysis Period (min):	15

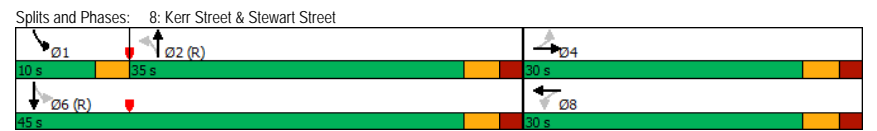


Timings
8: Kerr Street & Stewart Street

02/28/2024

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔		↔	↔	↔	↔	↔
Traffic Volume (vph)	50	10	10	15	10	370	55	550
Future Volume (vph)	50	10	10	15	10	370	55	550
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	24.0	24.0	6.0	24.0
Minimum Split (s)	30.0	30.0	30.0	30.0	32.0	32.0	10.0	32.0
Total Split (s)	30.0	30.0	30.0	30.0	35.0	35.0	10.0	45.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	46.7%	46.7%	13.3%	60.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.0	3.3
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	2.1
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.4		5.4	5.4	5.4	3.0	5.4
Lead/Lag					Lag	Lag	Lead	Lead
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effect Green (s)		15.2		15.2	47.1	47.1	54.5	53.2
Actuated g/C Ratio		0.20		0.20	0.63	0.63	0.73	0.71
v/c Ratio		0.29		0.29	0.02	0.36	0.09	0.50
Control Delay		21.5		9.9	12.7	12.6	5.9	9.7
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		21.5		9.9	12.7	12.6	5.9	9.7
LOS		C		A	B	B	A	A
Approach Delay		21.5		9.9	12.7		9.4	
Approach LOS		C		A	B		A	

Intersection Summary	
Cycle Length:	75
Actuated Cycle Length:	75
Offset:	13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	75
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.50
Intersection Signal Delay:	11.2
Intersection Capacity Utilization:	69.0%
ICU Level of Service:	C
Intersection LOS:	B
Analysis Period (min):	15



Queues

8: Kerr Street & Stewart Street

02/28/2024



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	81	109	11	418	60	652
w/c Ratio	0.29	0.29	0.02	0.36	0.09	0.50
Control Delay	21.5	9.9	12.7	12.6	5.9	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.5	9.9	12.7	12.6	5.9	9.7
Queue Length 50th (m)	8.5	3.4	0.6	27.0	1.6	31.1
Queue Length 95th (m)	16.4	13.0	3.8	69.7	7.7	91.8
Internal Link Dist (m)	71.6	36.6		141.0		79.0
Turn Bay Length (m)			20.0		20.0	
Base Capacity (vph)	447	556	476	1166	684	1301
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced w/c Ratio	0.18	0.20	0.02	0.36	0.09	0.50

Intersection Summary

HCM Signalized Intersection Capacity Analysis

8: Kerr Street & Stewart Street

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (vph)	50	10	15	10	15	75	10	370	15	55	550	50
Future Volume (vph)	50	10	15	10	15	75	10	370	15	55	550	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.4		5.4	5.4		3.0	5.4	
Lane Util. Factor	1.00				1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	0.99				0.96		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.98				1.00		0.98	1.00		0.99	1.00	
Frt	0.97				0.90		1.00	0.99		1.00	0.99	
Flt Protected	0.97				0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1675				1575		1766	1855		1773	1831	
Flt Permitted	0.77				0.97		0.41	1.00		0.44	1.00	
Satd. Flow (perm)	1334				1530		757	1855		821	1831	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	11	16	11	16	82	11	402	16	60	598	54
RTOR Reduction (vph)	0	13	0	0	68	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	68	0	0	41	0	11	417	0	60	649	0
Confl. Peds. (#/hr)	20		15	15		20	35		25	25		35
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.2			13.2		43.8	43.8		51.0	51.0	
Effective Green, g (s)		13.2			13.2		43.8	43.8		51.0	51.0	
Actuated g/C Ratio		0.18			0.18		0.58	0.58		0.68	0.68	
Clearance Time (s)		5.4			5.4		5.4	5.4		3.0	5.4	
Vehicle Extension (s)		4.0			4.0		4.0	4.0		3.0	4.0	
Lane Grp Cap (vph)		234			269		442	1083		611	1245	
v/s Ratio Prot							0.22			0.01	c0.35	
v/s Ratio Perm		c0.05			0.03		0.01			0.06		
v/c Ratio		0.29			0.15		0.02	0.38		0.10	0.52	
Uniform Delay, d1		26.8			26.2		6.6	8.4		4.3	5.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.9			0.4		0.1	1.0		0.1	1.6	
Delay (s)		27.8			26.5		6.7	9.4		4.4	7.5	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		27.8			26.5			9.3			7.3	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	13.8
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

9: Speers Internal Road 1 & Speers Road

02/28/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕	↕↕	
Traffic Volume (vph)	1055	35	5	1615	0	5
Future Volume (vph)	1055	35	5	1615	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt	0.995		0.865			
Flt Protected						
Satd. Flow (prot)	3592	0	0	3610	1644	0
Flt Permitted						
Satd. Flow (perm)	3592	0	0	3610	1644	0
Link Speed (k/h)	60		60		20	
Link Distance (m)	147.2		113.4		44.5	
Travel Time (s)	8.8		6.8		8.0	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1077	36	5	1648	0	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1113	0	0	1653	5	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	14		24		14	
Sign Control	Free		Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	58.1%
Analysis Period (min)	15
	ICU Level of Service B

HCM Unsignalized Intersection Capacity Analysis

9: Speers Internal Road 1 & Speers Road

02/28/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕	↕↕	
Traffic Volume (veh/h)	1055	35	5	1615	0	5
Future Volume (Veh/h)	1055	35	5	1615	0	5
Sign Control	Free			Stop		
Grade	0%			0%		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	1077	36	5	1648	0	5
Pedestrians	1			1		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	147			347		
pX, platoon unblocked				0.82	0.89	0.82
vC, conflicting volume				1113	1930	558
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				708	894	33
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				99	100	99
cM capacity (veh/h)				741	250	855

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	718	395	554	1099	5
Volume Left	0	0	5	0	0
Volume Right	0	36	0	0	5
cSH	1700	1700	741	1700	855
Volume to Capacity	0.42	0.23	0.01	0.65	0.01
Queue Length 95th (m)	0.0	0.0	0.2	0.0	0.1
Control Delay (s)	0.0	0.0	0.2	0.0	9.2
Lane LOS	A		A		
Approach Delay (s)	0.0		0.1		9.2
Approach LOS	A		A		

Intersection Summary

Average Delay	0.1
Intersection Capacity Utilization	58.1%
Analysis Period (min)	15
	ICU Level of Service B

Lanes, Volumes, Timings

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/28/2024

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↕	↕	↔	↔
Traffic Volume (vph)	0	5	0	0	35	5
Future Volume (vph)	0	5	0	0	35	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected						0.958
Satd. Flow (prot)	1644	0	1900	0	0	1820
Flt Permitted						0.958
Satd. Flow (perm)	1644	0	1900	0	0	1820
Link Speed (k/h)	20		20		20	
Link Distance (m)	34.1		49.5		44.5	
Travel Time (s)	6.1		8.9		8.0	
Confl. Peds. (#/hr)	8					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%					
Adj. Flow (vph)	0	6	0	0	44	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	0	0	0	0	50
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	14		24	
Sign Control	Stop		Free		Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	15.7% ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/28/2024

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↕	↕	↔	↔
Traffic Volume (veh/h)	0	5	0	0	35	5
Future Volume (Veh/h)	0	5	0	0	35	5
Sign Control	Stop		Free		Free	
Grade	0%					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	6	0	0	44	6
Pedestrians	2					
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0			1		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	96	8	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	96	8	0			
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			97	
cM capacity (veh/h)	882	1072			1636	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	6	0	50
Volume Left	0	0	44
Volume Right	6	0	0
cSH	1072	1700	1636
Volume to Capacity	0.01	0.00	0.03
Queue Length 95th (m)	0.1	0.0	0.6
Control Delay (s)	8.4	0.0	6.4
Lane LOS	A		A
Approach Delay (s)	8.4	0.0	6.4
Approach LOS	A		

Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	15.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings

11: PUDO + Parking & Speers Internal Road

02/28/2024

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↘			↖	↗	
Traffic Volume (vph)	25	10	5	5	0	5
Future Volume (vph)	25	10	5	5	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.961			0.865		
Flt Protected				0.976		
Satd. Flow (prot)	1790	0	0	1818	1611	0
Flt Permitted				0.976		
Satd. Flow (perm)	1790	0	0	1818	1611	0
Link Speed (k/h)	20			20	48	
Link Distance (m)	34.1			33.7	79.1	
Travel Time (s)	6.1			6.1	5.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	11	5	5	0	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	38	0	0	10	5	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	14.7%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

11: PUDO + Parking & Speers Internal Road

02/28/2024

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↘			↖	↗	
Traffic Volume (veh/h)	25	10	5	5	0	5
Future Volume (Veh/h)	25	10	5	5	0	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	11	5	5	0	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			38		48	32
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			38		48	32
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1572		959	1041

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	38	10	5
Volume Left	0	5	0
Volume Right	11	0	5
cSH	1700	1572	1041
Volume to Capacity	0.02	0.00	0.00
Queue Length 95th (m)	0.0	0.1	0.1
Control Delay (s)	0.0	3.7	8.5
Lane LOS	A	A	A
Approach Delay (s)	0.0	3.7	8.5
Approach LOS		A	

Intersection Summary

Average Delay	1.5
Intersection Capacity Utilization	14.7%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings
12: Underground & Speers Internal Road

02/28/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (vph)	25	5	5	10	0	0
Future Volume (vph)	25	5	5	10	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.979					
Flt Protected				0.984		
Satd. Flow (prot)	1860	0	0	1870	1900	0
Flt Permitted				0.984		
Satd. Flow (perm)	1860	0	0	1870	1900	0
Link Speed (k/h)	20		20		20	
Link Distance (m)	33.7		44.6		38.9	
Travel Time (s)	6.1		8.0		7.0	
Confl. Peds. (#/hr)			10			
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	32	6	6	13	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	38	0	0	19	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0		0.0		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	14		24		24	
Sign Control	Free		Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	8.3%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
12: Underground & Speers Internal Road

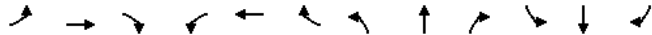
02/28/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (veh/h)	25	5	5	10	0	0
Future Volume (Veh/h)	25	5	5	10	0	0
Sign Control	Free		Free		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	32	6	6	13	0	0
Pedestrians	10		3			
Lane Width (m)	3.6		3.6			
Walking Speed (m/s)	1.1		1.1			
Percent Blockage	1		0			
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			38		70	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			38		70	
tC, single (s)			4.1		6.4	
tC, 2 stage (s)						
tF (s)			2.2		3.5	
p0 queue free %			100		100	
cM capacity (veh/h)			1585		927	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	38	19	0			
Volume Left	0	6	0			
Volume Right	6	0	0			
cSH	1700	1585	1700			
Volume to Capacity	0.02	0.00	0.01			
Queue Length 95th (m)	0.0	0.1	0.0			
Control Delay (s)	0.0	2.3	0.0			
Lane LOS	A		A			
Approach Delay (s)	0.0	2.3	0.0			
Approach LOS	A		A			
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization	8.3%		ICU Level of Service		A	
Analysis Period (min)	15					

Lanes, Volumes, Timings

13: PUDO Exit/Speers Internal Road 2 & Speers Internal Road/30 Speers

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↔	
Traffic Volume (vph)	5	20	0	0	0	10	0	5	0	0	0	15
Future Volume (vph)	5	20	0	0	0	10	0	5	0	0	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt						0.865						0.865
Flt Protected	0.990											
Satd. Flow (prot)	0	1809	0	0	1644	0	0	1863	0	0	1467	0
Flt Permitted	0.990											
Satd. Flow (perm)	0	1809	0	0	1644	0	0	1863	0	0	1467	0
Link Speed (k/h)	20				20		48				20	
Link Distance (m)	44.6				43.4		79.5				49.2	
Travel Time (s)	8.0				7.8		6.0				8.9	
Confl. Peds. (#/hr)	2				2		7					
Peak Hour Factor	0.63	0.63	0.92	0.92	0.63	0.63	0.92	0.92	0.92	0.63	0.92	0.63
Heavy Vehicles (%)	20%	0%	2%	2%	0%	0%	2%	2%	2%	0%	2%	12%
Adj. Flow (vph)	8	32	0	0	0	16	0	5	0	0	0	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	40	0	0	16	0	0	5	0	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0				0.0		0.0				0.0	
Link Offset(m)	0.0				0.0		0.0				0.0	
Crosswalk Width(m)	1.6				1.6		1.6				1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14		24		14		24		14	
Sign Control	Stop				Stop		Free				Free	

Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	15.4%		ICU Level of Service A									
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

13: PUDO Exit/Speers Internal Road 2 & Speers Internal Road/30 Speers

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↔			↔			↕			↔		
Traffic Volume (veh/h)	5	20	0	0	0	10	0	5	0	0	0	15	
Future Volume (Veh/h)	5	20	0	0	0	10	0	5	0	0	0	15	
Sign Control	Stop				Stop		Free				Free		
Grade	0%												
Peak Hour Factor	0.63	0.63	0.92	0.92	0.63	0.63	0.92	0.92	0.92	0.63	0.92	0.63	
Hourly flow rate (vph)	8	32	0	0	0	16	0	5	0	0	0	24	
Pedestrians	3				7						2		
Lane Width (m)	3.6				3.6						3.6		
Walking Speed (m/s)	1.1				1.1						1.1		
Percent Blockage	0				1						0		
Right turn flare (veh)													
Median type						None				None			
Median storage (veh)													
Upstream signal (m)													
pX, platoon unblocked													
vC, conflicting volume	38	27	15	40	39	14	27						12
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	38	27	15	40	39	14	27						12
tC, single (s)	7.3	6.5	6.2	7.1	6.5	6.2	4.1						4.1
tC, 2 stage (s)													
tF (s)	3.7	4.0	3.3	3.5	4.0	3.3	2.2						2.2
p0 queue free %	99	96	100	100	100	98	100						100
cM capacity (veh/h)	899	862	1062	924	849	1063	1582						1610

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	40	16	5	24
Volume Left	8	0	0	0
Volume Right	0	16	0	24
cSH	869	1063	1582	1610
Volume to Capacity	0.05	0.02	0.00	0.00
Queue Length 95th (m)	1.1	0.3	0.0	0.0
Control Delay (s)	9.3	8.4	0.0	0.0
Lane LOS	A	A		
Approach Delay (s)	9.3	8.4	0.0	0.0
Approach LOS	A	A		

Intersection Summary			
Average Delay	6.0		
Intersection Capacity Utilization	15.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (vph)	0	1060	5	10	1605	0	10	0	10	5	0	5
Future Volume (vph)	0	1060	5	10	1605	0	10	0	10	5	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999						0.932			0.932	
Flt Protected								0.976			0.976	
Satd. Flow (prot)	0	3536	0	0	3540	0	0	1728	0	0	1694	0
Flt Permitted								0.976			0.976	
Satd. Flow (perm)	0	3536	0	0	3540	0	0	1728	0	0	1694	0
Link Speed (k/h)		60			60			20			20	
Link Distance (m)		113.4			233.1			49.2			39.0	
Travel Time (s)		6.8			14.0			8.9			7.0	
Confl. Peds. (#/hr)			8	8								
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	2%	0%	2%	2%	2%
Adj. Flow (vph)	0	1116	5	11	1689	0	11	0	11	5	0	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1121	0	0	1700	0	0	22	0	0	10	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	61.4%
ICU Level of Service	B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (veh/h)	0	1060	5	10	1605	0	10	0	10	5	0	5
Future Volume (Veh/h)	0	1060	5	10	1605	0	10	0	10	5	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Hourly flow rate (vph)	0	1116	5	11	1689	0	11	0	11	5	0	5
Pedestrians		4			4			8			8	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		0			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		261			233							
pX, platoon unblocked	0.79				0.84			0.87	0.87	0.84	0.87	0.79
vC, conflicting volume	1689				1129			2002	2838	572	2284	848
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1349				784			1052	2010	125	1376	2013
tC, single (s)	4.1				4.1			7.5	6.5	6.9	7.5	6.5
tC, 2 stage (s)												
tF (s)	2.2				2.2			3.5	4.0	3.3	3.5	4.0
p0 queue free %	100				98			93	100	99	94	100
cM capacity (veh/h)	402				707			154	50	759	88	49

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	744	377	574	1126	22	10
Volume Left	0	0	11	0	11	5
Volume Right	0	5	0	0	11	5
cSH	1700	1700	707	1700	256	152
Volume to Capacity	0.44	0.22	0.02	0.66	0.09	0.07
Queue Length 95th (m)	0.0	0.0	0.4	0.0	2.1	1.6
Control Delay (s)	0.0	0.0	0.4	0.0	20.4	30.4
Lane LOS			A		C	D
Approach Delay (s)	0.0		0.1		20.4	30.4
Approach LOS			C		D	

Intersection Summary

Average Delay	0.3
Intersection Capacity Utilization	61.4%
ICU Level of Service	B
Analysis Period (min)	15

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

02/28/2024

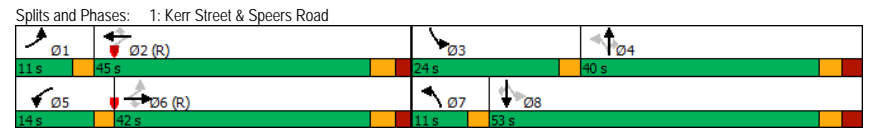
	←	→	↙	↘	←	↙	↘	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↘	↘	↙	↘	↘	↙	↘	↘	↙	↘	↘
Traffic Volume (vph)	35	650	90	185	495	185	100	115	370	355	165	75
Future Volume (vph)	35	650	90	185	495	185	100	115	370	355	165	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	105.0		0.0	75.0		100.0	50.0		45.0	80.0		75.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor	0.98		0.97	1.00		0.94	0.95		0.93	0.92		0.93
Frt		0.850				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3539	1615	1752	3539	1583	1787	1900	1599	3467	1900	1615
Flt Permitted	0.459			0.303			0.647			0.569		
Satd. Flow (perm)	853	3539	1560	557	3539	1485	1160	1900	1486	1914	1900	1501
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			112			195			251			81
Link Speed (k/h)		60			60			50				50
Link Distance (m)		235.8			147.2			127.4				167.2
Travel Time (s)		14.1			8.8			9.2				12.0
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Adj. Flow (vph)	37	684	95	195	521	195	105	121	389	374	174	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	684	95	195	521	195	105	121	389	374	174	79
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			7.2				7.2
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		1.6			1.6			1.6				1.6
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

02/28/2024

	←	→	↙	↘	←	↙	↘	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Detector Phase	1	6	6	5	2	2	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	7.0	25.0	25.0	7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	10.0	30.9	30.9	10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3	34.3
Total Split (s)	11.0	42.0	42.0	14.0	45.0	45.0	11.0	40.0	40.0	24.0	53.0	53.0
Total Split (%)	9.2%	35.0%	35.0%	11.7%	37.5%	37.5%	9.2%	33.3%	33.3%	20.0%	44.2%	44.2%
Maximum Green (s)	8.0	36.1	36.1	11.0	39.1	39.1	8.0	33.7	33.7	21.0	46.7	46.7
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	0.0	2.2	2.2	0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.5	5.5	5.5	2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	4.0
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		14.0	14.0		14.0	14.0		14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		15	15		15	15		35	35		35	35
Act Effect Green (s)	65.7	55.6	55.6	72.7	63.6	63.6	33.0	20.8	20.8	41.3	26.1	26.1
Actuated g/C Ratio	0.55	0.46	0.46	0.61	0.53	0.53	0.28	0.17	0.17	0.34	0.22	0.22
v/c Ratio	0.07	0.42	0.12	0.44	0.28	0.22	0.29	0.37	0.84	0.44	0.42	0.20
Control Delay	13.7	25.2	4.1	15.9	19.0	4.0	27.2	44.5	31.9	29.3	41.4	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.7	25.2	4.1	15.9	19.0	4.0	27.2	44.5	31.9	29.3	41.4	7.3
LOS	B	C	A	B	B	A	C	D	C	C	D	A
Approach Delay		22.3			15.1			33.6				29.9
Approach LOS		C			B			C				C

Intersection Summary	
Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	43 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.84
Intersection Signal Delay:	24.0
Intersection Capacity Utilization:	72.7%
Analysis Period (min):	15
Intersection LOS:	C
ICU Level of Service:	C



Timings
1: Kerr Street & Speers Road

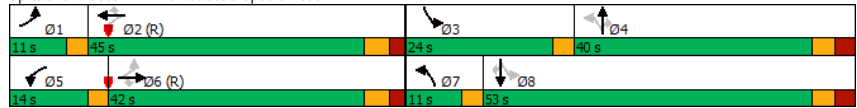
02/28/2024

	↖	→	↘	↙	←	↖	↙	↗	↘	↖	↙	↗
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↖	↖	↖↗	↖	↖	↖	↖	↖↗	↖	↖
Traffic Volume (vph)	35	650	90	185	495	185	100	115	370	355	165	75
Future Volume (vph)	35	650	90	185	495	185	100	115	370	355	165	75
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Detector Phase	1	6	6	5	2	2	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	7.0	25.0	25.0	7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	10.0	30.9	30.9	10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3	34.3
Total Split (s)	11.0	42.0	42.0	14.0	45.0	45.0	11.0	40.0	40.0	24.0	53.0	53.0
Total Split (%)	9.2%	35.0%	35.0%	11.7%	37.5%	37.5%	9.2%	33.3%	33.3%	20.0%	44.2%	44.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	0.0	2.2	2.2	0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
Act Effect Green (s)	65.7	55.6	55.6	72.7	63.6	63.6	33.0	20.8	20.8	41.3	26.1	26.1
Actuated g/C Ratio	0.55	0.46	0.46	0.61	0.53	0.53	0.28	0.17	0.17	0.34	0.22	0.22
v/c Ratio	0.07	0.42	0.12	0.44	0.28	0.22	0.29	0.37	0.84	0.44	0.42	0.20
Control Delay	13.7	25.2	4.1	15.9	19.0	4.0	27.2	44.5	31.9	29.3	41.4	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.7	25.2	4.1	15.9	19.0	4.0	27.2	44.5	31.9	29.3	41.4	7.3
LOS	B	C	A	B	B	A	C	D	C	C	D	A
Approach Delay		22.3			15.1			33.6			29.9	
Approach LOS		C			B			C			C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 43 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.84
 Intersection Signal Delay: 24.0 Intersection LOS: C
 Intersection Capacity Utilization 72.7% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 1: Kerr Street & Speers Road



Queues
1: Kerr Street & Speers Road

02/28/2024

	↖	→	↘	↙	←	↖	↙	↗	↘	↖	↙	↗
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	37	684	95	195	521	195	105	121	389	374	174	79
v/c Ratio	0.07	0.42	0.12	0.44	0.28	0.22	0.29	0.37	0.84	0.44	0.42	0.20
Control Delay	13.7	25.2	4.1	15.9	19.0	4.0	27.2	44.5	31.9	29.3	41.4	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.7	25.2	4.1	15.9	19.0	4.0	27.2	44.5	31.9	29.3	41.4	7.3
Queue Length 50th (m)	3.3	54.8	0.0	19.2	36.8	0.0	17.1	25.4	32.4	33.1	35.9	0.0
Queue Length 95th (m)	10.3	93.6	9.0	41.0	62.1	14.8	24.1	37.5	62.2	36.1	46.7	9.9
Internal Link Dist (m)		211.8			123.2		103.4				143.2	
Turn Bay Length (m)	105.0			75.0		100.0	50.0		45.0	80.0		75.0
Base Capacity (vph)	536	1640	783	461	1876	878	368	533	597	930	739	633
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.42	0.12	0.42	0.28	0.22	0.29	0.23	0.65	0.40	0.24	0.12

Intersection Summary

HCM Signalized Intersection Capacity Analysis

1: Kerr Street & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	35	650	90	185	495	185	100	115	370	355	165	75
Future Volume (vph)	35	650	90	185	495	185	100	115	370	355	165	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.94	1.00	1.00	0.93	1.00	1.00	0.93
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00	0.96	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1786	3539	1560	1751	3539	1485	1734	1900	1486	3321	1900	1501
Flt Permitted	0.46	1.00	1.00	0.30	1.00	1.00	0.65	1.00	1.00	0.57	1.00	1.00
Satd. Flow (perm)	863	3539	1560	558	3539	1485	1182	1900	1486	1991	1900	1501
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	37	684	95	195	521	195	105	121	389	374	174	79
RTOR Reduction (vph)	0	0	51	0	0	94	0	0	207	0	0	62
Lane Group Flow (vph)	37	684	44	195	521	101	105	121	182	374	174	17
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Actuated Green, G (s)	59.9	55.5	55.5	69.7	62.3	62.3	29.7	20.8	20.8	38.1	26.2	26.2
Effective Green, g (s)	59.9	55.5	55.5	69.7	62.3	62.3	29.7	20.8	20.8	38.1	26.2	26.2
Actuated g/C Ratio	0.50	0.46	0.46	0.58	0.52	0.52	0.25	0.17	0.17	0.32	0.22	0.22
Clearance Time (s)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Vehicle Extension (s)	2.5	5.5	5.5	2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	464	1636	721	435	1837	770	333	329	257	790	414	327
v/s Ratio Prot	0.00	0.19		c0.04	0.15		0.02	0.06		c0.06	0.09	
v/s Ratio Perm	0.04		0.03	c0.22		0.07	0.05		c0.12	0.09		0.01
v/c Ratio	0.08	0.42	0.06	0.45	0.28	0.13	0.32	0.37	0.71	0.47	0.42	0.05
Uniform Delay, d1	15.4	21.5	17.8	12.9	16.3	14.9	36.2	43.8	46.7	31.6	40.4	37.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.8	0.2	0.5	0.4	0.4	0.4	1.0	9.1	0.3	0.9	0.1
Delay (s)	15.4	22.3	18.0	13.4	16.7	15.2	36.6	44.7	55.9	31.9	41.3	37.2
Level of Service	B	C	B	B	B	B	D	D	E	C	D	D
Approach Delay (s)		21.5			15.7			50.4			35.2	
Approach LOS		C			B			D			D	

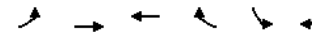
Intersection Summary		
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.52	
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	72.7%	ICU Level of Service
Analysis Period (min)	15	

c Critical Lane Group

Lanes, Volumes, Timings

2: Speers Road & Cross Avenue

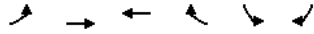
02/28/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	220	1205	605	20	5	245
Future Volume (vph)	220	1205	605	20	5	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	80.0			0.0	45.0	0.0
Storage Lanes	1			0	1	2
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	0.88
Ped Bike Factor	1.00		1.00			
Frt			0.995			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1703	3610	3554	0	1805	2733
Flt Permitted	0.373				0.950	
Satd. Flow (perm)	667	3610	3554	0	1805	2733
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			3			255
Link Speed (k/h)		60	60		48	
Link Distance (m)		233.1	101.5		84.0	
Travel Time (s)		14.0	6.1		6.3	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Adj. Flow (vph)	229	1255	630	21	5	255
Shared Lane Traffic (%)						
Lane Group Flow (vph)	229	1255	651	0	5	255
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
2: Speers Road & Cross Avenue

02/28/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Detector Phase	5	2	6		4	4
Switch Phase						
Minimum Initial (s)	6.0	38.0	38.0		10.0	10.0
Minimum Split (s)	12.0	47.6	47.6		15.8	15.8
Total Split (s)	35.0	109.0	74.0		31.0	31.0
Total Split (%)	25.0%	77.9%	52.9%		22.1%	22.1%
Maximum Green (s)	29.0	102.4	67.4		25.2	25.2
Yellow Time (s)	4.0	3.7	3.7		3.3	3.3
All-Red Time (s)	2.0	2.9	2.9		2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6		5.8	5.8
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Recall Mode	None	C-Min	C-Min		None	None
Walk Time (s)		10.0	10.0			
Flash Dont Walk (s)		31.0	31.0			
Pedestrian Calls (#/hr)		5	5			
Act Effect Green (s)	118.0	117.4	101.9		10.2	10.2
Actuated g/C Ratio	0.84	0.84	0.73		0.07	0.07
v/c Ratio	0.36	0.41	0.25		0.04	0.58
Control Delay	3.7	3.3	6.7		60.8	12.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	3.7	3.3	6.7		60.8	12.8
LOS	A	A	A		E	B
Approach Delay		3.3	6.7		13.7	
Approach LOS		A	A		B	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 99 (71%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 5.4 Intersection LOS: A
 Intersection Capacity Utilization 70.0% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: Speers Road & Cross Avenue



Timings
2: Speers Road & Cross Avenue

02/28/2024

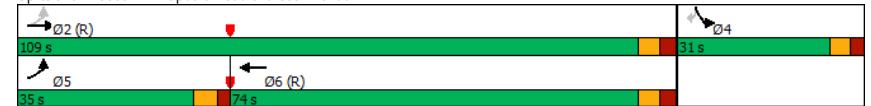


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↕↕	↕↕	↔	↕↕
Traffic Volume (vph)	220	1205	605	5	245
Future Volume (vph)	220	1205	605	5	245
Turn Type	pm+pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2				4
Detector Phase	5	2	6	4	4
Switch Phase					
Minimum Initial (s)	6.0	38.0	38.0	10.0	10.0
Minimum Split (s)	12.0	47.6	47.6	15.8	15.8
Total Split (s)	35.0	109.0	74.0	31.0	31.0
Total Split (%)	25.0%	77.9%	52.9%	22.1%	22.1%
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	None	None
Act Effect Green (s)	118.0	117.4	101.9	10.2	10.2
Actuated g/C Ratio	0.84	0.84	0.73	0.07	0.07
v/c Ratio	0.36	0.41	0.25	0.04	0.58
Control Delay	3.7	3.3	6.7	60.8	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.7	3.3	6.7	60.8	12.8
LOS	A	A	A	E	B
Approach Delay		3.3	6.7	13.7	
Approach LOS		A	A	B	

Intersection Summary

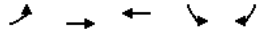
Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 99 (71%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 5.4 Intersection LOS: A
 Intersection Capacity Utilization 70.0% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: Speers Road & Cross Avenue



Queues
2: Speers Road & Cross Avenue

02/28/2024

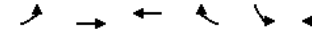


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	229	1255	651	5	255
w/c Ratio	0.36	0.41	0.25	0.04	0.58
Control Delay	3.7	3.3	6.7	60.8	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.7	3.3	6.7	60.8	12.8
Queue Length 50th (m)	8.8	35.0	28.0	1.3	0.0
Queue Length 95th (m)	14.2	44.4	38.5	5.8	14.3
Internal Link Dist (m)		209.1	77.5	60.0	
Turn Bay Length (m)	80.0		45.0		
Base Capacity (vph)	776	3026	2588	324	701
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.30	0.41	0.25	0.02	0.36

Intersection Summary

HCM Signalized Intersection Capacity Analysis
2: Speers Road & Cross Avenue

02/28/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕↕	↕↕		↔	↕↕
Traffic Volume (vph)	220	1205	605	20	5	245
Future Volume (vph)	220	1205	605	20	5	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.6	6.6		5.8	5.8
Lane Util. Factor	1.00	0.95	0.95		1.00	0.88
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1701	3610	3555		1805	2733
Flt Permitted	0.37	1.00	1.00		0.95	1.00
Satd. Flow (perm)	668	3610	3555		1805	2733
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	229	1255	630	21	5	255
RTOR Reduction (vph)	0	0	1	0	0	236
Lane Group Flow (vph)	229	1255	650	0	5	19
Confl. Peds. (#/hr)	5			5		
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	117.4	117.4	102.0		10.2	10.2
Effective Green, g (s)	117.4	117.4	102.0		10.2	10.2
Actuated g/C Ratio	0.84	0.84	0.73		0.07	0.07
Clearance Time (s)	6.0	6.6	6.6		5.8	5.8
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Lane Grp Cap (vph)	629	3027	2590		131	199
v/s Ratio Prot	0.02	c0.35	0.18		0.00	
v/s Ratio Perm	0.28					c0.01
w/c Ratio	0.36	0.41	0.25		0.04	0.09
Uniform Delay, d1	2.5	2.8	6.3		60.3	60.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.4	0.4	0.2		0.1	0.2
Delay (s)	2.9	3.2	6.5		60.5	60.8
Level of Service	A	A	A		E	E
Approach Delay (s)		3.2	6.5		60.8	
Approach LOS		A	A		E	

Intersection Summary

HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

3: St. Augustine Drive & Speers Road

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕			↕				↕		↕	
Traffic Volume (vph)	5	725	15	0	645	20	5	0	50	0	0	0
Future Volume (vph)	5	725	15	0	645	20	5	0	50	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0			0			1			0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.995				0.865			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1805	3561	0	0	3557	0	0	0	1644	0	1900	0
Flt Permitted	0.950							0.950				
Satd. Flow (perm)	1805	3561	0	0	3557	0	0	0	1644	0	1900	0
Link Speed (k/h)		60			60				40			30
Link Distance (m)		248.1			235.8				188.1			117.6
Travel Time (s)		14.9			14.1				16.9			14.1
Confl. Peds. (#/hr)	8		5	5		8	1		1	1		1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	5	755	16	0	672	21	5	0	52	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	771	0	0	693	0	0	5	52	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6				0.0			0.0
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		1.6			1.6				1.6			1.6
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free				Stop			Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

3: St. Augustine Drive & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕			↕				↕		↕	
Traffic Volume (veh/h)	5	725	15	0	645	20	5	0	50	0	0	0
Future Volume (Veh/h)	5	725	15	0	645	20	5	0	50	0	0	0
Sign Control		Free			Free				Stop			Stop
Grade		0%			0%				0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	755	16	0	672	21	5	0	52	0	0	0
Pedestrians		1			1				5			8
Lane Width (m)		3.6			3.6				3.6			3.6
Walking Speed (m/s)		1.1			1.1				1.1			1.1
Percent Blockage		0			0				0			1
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)					236							
pX, platoon unblocked	0.93						0.93	0.93		0.93	0.93	0.93
vC, conflicting volume	701				776				1115	1479	392	1131
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	519				776				966	1358	392	983
tC, single (s)	4.1				4.1				7.5	6.5	6.9	7.5
tC, 2 stage (s)												
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5
p0 queue free %	99				100				97	100	91	100
cM capacity (veh/h)	973				845				193	137	610	171

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	5	503	268	448	245	57	0
Volume Left	5	0	0	0	0	5	0
Volume Right	0	0	16	0	21	52	0
cSH	973	1700	1700	1700	1700	513	1700
Volume to Capacity	0.01	0.30	0.16	0.26	0.14	0.11	0.00
Queue Length 95th (m)	0.1	0.0	0.0	0.0	0.0	2.8	0.0
Control Delay (s)	8.7	0.0	0.0	0.0	0.0	12.9	0.0
Lane LOS	A					B	A
Approach Delay (s)	0.1			0.0		12.9	0.0
Approach LOS						B	A

Intersection Summary

Average Delay	0.5
Intersection Capacity Utilization Err%	Err% ICU Level of Service H
Analysis Period (min)	15

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

02/28/2024

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙		↑	↗	↘	↓
Traffic Volume (vph)	80	165	270	60	95	520
Future Volume (vph)	80	165	270	60	95	520
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0	0.0		50.0	50.0	
Storage Lanes	0	0		1	1	
Taper Length (m)	2.5			2.5		
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor	0.98			0.97	1.00	
Frt	0.909			0.850		
Flt Protected	0.984			0.950		
Satd. Flow (prot)	1652	0	3574	1583	1805	3574
Flt Permitted	0.984			0.481		
Satd. Flow (perm)	1645	0	3574	1540	910	3574
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	126			62		
Link Speed (k/h)	50		50		50	
Link Distance (m)	265.3		167.2		94.4	
Travel Time (s)	19.1		12.0		6.8	
Confl. Peds. (#/hr)	13	6		4	4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	1%	1%	2%	0%	1%
Adj. Flow (vph)	82	170	278	62	98	536
Shared Lane Traffic (%)						
Lane Group Flow (vph)	252	0	278	62	98	536
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1		2	1	1	2
Detector Template	Left		Thru	Right	Left	Thru
Leading Detector (m)	2.0		10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0		0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4		9.4	
Detector 2 Size(m)			0.6		0.6	
Detector 2 Type			Cl+Ex		Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)			0.0		0.0	

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

02/28/2024

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Prot		NA	Perm	pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases				2	6	
Detector Phase	3		2	2	1	6
Switch Phase						
Minimum Initial (s)	10.0		18.0	18.0	7.0	18.0
Minimum Split (s)	31.4		28.2	28.2	11.0	28.2
Total Split (s)	32.0		40.0	40.0	14.0	54.0
Total Split (%)	37.2%		46.5%	46.5%	16.3%	62.8%
Maximum Green (s)	26.6		34.8	34.8	10.0	48.8
Yellow Time (s)	3.3		3.3	3.3	4.0	3.3
All-Red Time (s)	2.1		1.9	1.9	0.0	1.9
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4		5.2	5.2	4.0	5.2
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0		3.5	3.5	2.5	3.5
Recall Mode	None		Min	Min	None	Min
Walk Time (s)	10.0		10.0	10.0		10.0
Flash Dont Walk (s)	16.0		13.0	13.0		13.0
Pedestrian Calls (#/hr)	0		5	5		5
Act Effect Green (s)	11.3		19.2	19.2	29.0	27.7
Actuated g/C Ratio	0.23		0.38	0.38	0.58	0.56
v/c Ratio	0.53		0.20	0.10	0.15	0.27
Control Delay	14.5		12.0	4.5	5.3	6.2
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	14.5		12.0	4.5	5.3	6.2
LOS	B		B	A	A	A
Approach Delay	14.5		10.6			6.0
Approach LOS	B		B			A

Intersection Summary	
Area Type:	Other
Cycle Length:	86
Actuated Cycle Length:	49.9
Natural Cycle:	75
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.53
Intersection Signal Delay:	9.0
Intersection Capacity Utilization:	49.7%
Analysis Period (min):	15
Intersection LOS:	A
ICU Level of Service:	A

Splits and Phases: 4: Kerr Street & Shepherd Road



Timings

4: Kerr Street & Shepherd Road

02/28/2024

	↙	↑	↘	↙	↓
Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Configurations	↘	↑↑	↘	↘	↑↑
Traffic Volume (vph)	80	270	60	95	520
Future Volume (vph)	80	270	60	95	520
Turn Type	Prot	NA	Perm	pm+pt	NA
Protected Phases	3	2		1	6
Permitted Phases			2	6	
Detector Phase	3	2	2	1	6
Switch Phase					
Minimum Initial (s)	10.0	18.0	18.0	7.0	18.0
Minimum Split (s)	31.4	28.2	28.2	11.0	28.2
Total Split (s)	32.0	40.0	40.0	14.0	54.0
Total Split (%)	37.2%	46.5%	46.5%	16.3%	62.8%
Yellow Time (s)	3.3	3.3	3.3	4.0	3.3
All-Red Time (s)	2.1	1.9	1.9	0.0	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	5.2	5.2	4.0	5.2
Lead/Lag		Lag	Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	Yes	
Recall Mode	None	Min	Min	None	Min
Act Effct Green (s)	11.3	19.2	19.2	29.0	27.7
Actuated g/C Ratio	0.23	0.38	0.38	0.58	0.56
v/c Ratio	0.53	0.20	0.10	0.15	0.27
Control Delay	14.5	12.0	4.5	5.3	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.5	12.0	4.5	5.3	6.2
LOS	B	B	A	A	A
Approach Delay	14.5	10.6			6.0
Approach LOS	B	B			A

Intersection Summary

Cycle Length: 86
 Actuated Cycle Length: 49.9
 Natural Cycle: 75
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.53
 Intersection Signal Delay: 9.0
 Intersection Capacity Utilization 49.7%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 4: Kerr Street & Shepherd Road



Queues

4: Kerr Street & Shepherd Road

02/28/2024

	↙	↑	↘	↙	↓
Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	252	278	62	98	536
v/c Ratio	0.53	0.20	0.10	0.15	0.27
Control Delay	14.5	12.0	4.5	5.3	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.5	12.0	4.5	5.3	6.2
Queue Length 50th (m)	9.7	8.5	0.0	3.0	10.2
Queue Length 95th (m)	29.3	17.8	6.0	9.0	20.9
Internal Link Dist (m)	241.3	143.2			70.4
Turn Bay Length (m)	30.0		50.0	50.0	
Base Capacity (vph)	956	2544	1114	711	3380
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.26	0.11	0.06	0.14	0.16

Intersection Summary

HCM Signalized Intersection Capacity Analysis

4: Kerr Street & Shepherd Road

02/28/2024

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	80	165	270	60	95	520
Future Volume (vph)	80	165	270	60	95	520
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4		5.2	5.2	4.0	5.2
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	
Flpb, ped/bikes	0.99		1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.91		1.00	0.85	1.00	1.00
Flt Protected	0.98		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1654		3574	1545	1803	3574
Flt Permitted	0.98		1.00	1.00	0.48	1.00
Satd. Flow (perm)	1654		3574	1545	912	3574
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	82	170	278	62	98	536
RTOR Reduction (vph)	98	0	0	38	0	0
Lane Group Flow (vph)	154	0	278	24	98	536
Confl. Peds. (#/hr)	13	6		4	4	
Heavy Vehicles (%)	3%	1%	1%	2%	0%	1%
Turn Type	Prot		NA	Perm	pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases				2	6	
Actuated Green, G (s)	11.3		19.2	19.2	28.7	28.7
Effective Green, g (s)	11.3		19.2	19.2	28.7	28.7
Actuated g/C Ratio	0.22		0.38	0.38	0.57	0.57
Clearance Time (s)	5.4		5.2	5.2	4.0	5.2
Vehicle Extension (s)	3.0		3.5	3.5	2.5	3.5
Lane Grp Cap (vph)	369		1356	586	614	2027
v/s Ratio Prot	c0.09		0.08		0.02	c0.15
v/s Ratio Perm				0.02	0.07	
v/c Ratio	0.42		0.21	0.04	0.16	0.26
Uniform Delay, d1	16.8		10.6	9.9	5.2	5.6
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8		0.1	0.0	0.1	0.1
Delay (s)	17.6		10.7	9.9	5.3	5.7
Level of Service	B		B	A	A	A
Approach Delay (s)	17.6		10.5			5.6
Approach LOS	B		B			A

Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	50.6	Sum of lost time (s)	14.6
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

5: Kerr Street & Wycroft Road

02/28/2024

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	5	85	190	250	530	125
Future Volume (vph)	5	85	190	250	530	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	75.0	0.0	75.0			0.0
Storage Lanes	1	1	1			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850			0.971	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1553	1703	3610	3479	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1553	1703	3610	3479	0
Link Speed (k/h)	50		50	50		
Link Distance (m)	561.6		394.3	98.1		
Travel Time (s)	40.4		28.4	7.1		
Confl. Peds. (#/hr)			5			5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	4%	6%	0%	0%	4%
Adj. Flow (vph)	5	90	202	266	564	133
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	90	202	266	697	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6		3.6	3.6		
Link Offset(m)	0.0		0.0	0.0		
Crosswalk Width(m)	1.6		1.6	1.6		
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	42.6%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

5: Kerr Street & Wycroft Road

02/28/2024

Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Volume (veh/h)	5	85	190	250	530	125	
Future Volume (Veh/h)	5	85	190	250	530	125	
Sign Control	Stop		Free		Free		
Grade	0%		0%		0%		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	
Hourly flow rate (vph)	5	90	202	266	564	133	
Pedestrians	5						
Lane Width (m)	3.6						
Walking Speed (m/s)	1.1						
Percent Blockage	0						
Right turn flare (veh)							
Median type			None		None		
Median storage (veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	1172	354	702				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1172	354	702				
tC, single (s)	6.8	7.0	4.2				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.3				
p0 queue free %	97	86	77				
cM capacity (veh/h)	143	634	861				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	5	90	202	133	133	376	321
Volume Left	5	0	202	0	0	0	0
Volume Right	0	90	0	0	0	0	133
cSH	143	634	861	1700	1700	1700	1700
Volume to Capacity	0.03	0.14	0.23	0.08	0.08	0.22	0.19
Queue Length 95th (m)	0.8	3.7	6.9	0.0	0.0	0.0	0.0
Control Delay (s)	31.0	11.6	10.5	0.0	0.0	0.0	0.0
Lane LOS	D	B	B				
Approach Delay (s)	12.6		4.5		0.0		
Approach LOS	B						
Intersection Summary							
Average Delay			2.6				
Intersection Capacity Utilization			42.6%		ICU Level of Service		A
Analysis Period (min)			15				

Lanes, Volumes, Timings

6: Kerr Street & Prince Charles Drive

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	5	5	0	75	5	500	5	40	395	5
Future Volume (vph)	5	0	5	5	0	75	5	500	5	40	395	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.932		0.873		0.999		0.999					
Fit Protected	0.976		0.997		0.995		0.995					
Satd. Flow (prot)	0	1728	0	0	1654	0	0	1876	0	0	1846	0
Fit Permitted	0.976		0.997		0.995		0.995					
Satd. Flow (perm)	0	1728	0	0	1654	0	0	1876	0	0	1846	0
Link Speed (k/h)	40		40		50		50					
Link Distance (m)	57.8		56.0		134.8		127.4					
Travel Time (s)	5.2		5.0		9.7		9.2					
Confl. Peds. (#/hr)	4		1	1		4	21		31	31		21
Confl. Bikes (#/hr)							1					
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	50%	0%	0%	0%	0%	20%	1%	0%	5%	2%	4%
Adj. Flow (vph)	5	0	5	5	0	79	5	526	5	42	416	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	10	0	0	84	0	0	536	0	0	463	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0		0.0		0.0		0.0		3.6			
Link Offset(m)	0.0		0.0		0.0		0.0		0.0			
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6			
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control	Stop		Stop		Free		Free		Free			
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	60.4%						ICU Level of Service B					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

6: Kerr Street & Prince Charles Drive

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	5	0	5	5	0	75	5	500	5	40	395	5
Future Volume (Veh/h)	5	0	5	5	0	75	5	500	5	40	395	5
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	0	5	5	0	79	5	526	5	42	416	5
Pedestrians	21			31			1			4		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	2			3			0			0		
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (m)							238					
pX, platoon unblocked	0.92	0.92	0.87	0.92	0.92	0.90	0.87					0.90
vC, conflicting volume	1145	1096	440	1078	1096	564	442					562
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	874	820	283	801	820	461	285					460
tC, single (s)	7.1	7.0	6.2	7.1	6.5	6.2	4.3					4.1
tC, 2 stage (s)												
tF (s)	3.5	4.5	3.3	3.5	4.0	3.3	2.4					2.2
p0 queue free %	97	100	99	98	100	85	100					96
cM capacity (veh/h)	193	218	649	251	260	528	1009					951
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	10	84	536	463								
Volume Left	5	5	5	42								
Volume Right	5	79	5	5								
cSH	298	495	1009	951								
Volume to Capacity	0.03	0.17	0.00	0.04								
Queue Length 95th (m)	0.8	4.6	0.1	1.1								
Control Delay (s)	17.5	13.7	0.1	1.3								
Lane LOS	C	B	A	A								
Approach Delay (s)	17.5	13.7	0.1	1.3								
Approach LOS	C	B										
Intersection Summary												
Average Delay				1.8								
Intersection Capacity Utilization				60.4%	ICU Level of Service							B
Analysis Period (min)				15								

Lanes, Volumes, Timings

7: Kerr Street & Elmwood Road

02/28/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	30	10	5	480	360	45
Future Volume (vph)	30	10	5	480	360	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.965		0.985			
Fit Protected	0.964					
Satd. Flow (prot)	1723	0	0	1860	1825	0
Fit Permitted	0.964					
Satd. Flow (perm)	1723	0	0	1860	1825	0
Link Speed (k/h)	40		50			
Link Distance (m)	171.2		103.0		134.8	
Travel Time (s)	15.4		7.4		9.7	
Confl. Peds. (#/hr)	1	2	34	34		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	10%	20%	2%	2%	7%
Adj. Flow (vph)	32	11	5	505	379	47
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	0	0	510	426	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6		3.6			
Link Offset(m)	0.0		0.0			
Crosswalk Width(m)	1.6		1.6			
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24	14		
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	39.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

7: Kerr Street & Elmwood Road

02/28/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↕		↔	
Traffic Volume (veh/h)	30	10	5	480	360	45
Future Volume (Veh/h)	30	10	5	480	360	45
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	32	11	5	505	379	47
Pedestrians	34		2		1	
Lane Width (m)	3.6		3.6		3.6	
Walking Speed (m/s)	1.1		1.1		1.1	
Percent Blockage	3		0		0	
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)			103		262	
pX, platoon unblocked	0.91	0.93	0.93			
vC, conflicting volume	952	438	460			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	728	359	382			
tC, single (s)	6.4	6.3	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.4			
p0 queue free %	91	98	99			
cM capacity (veh/h)	346	601	978			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	43	510	426			
Volume Left	32	5	0			
Volume Right	11	0	47			
cSH	388	978	1700			
Volume to Capacity	0.11	0.01	0.25			
Queue Length 95th (m)	2.8	0.1	0.0			
Control Delay (s)	15.4	0.1	0.0			
Lane LOS	C	A				
Approach Delay (s)	15.4	0.1	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			39.9%		ICU Level of Service A	
Analysis Period (min)			15			

Lanes, Volumes, Timings

8: Kerr Street & Stewart Street

02/28/2024



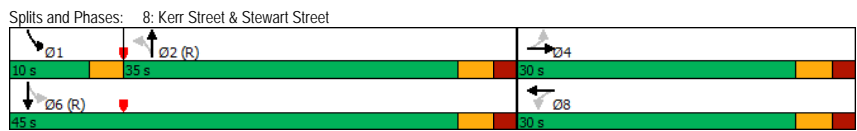
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↕		↕		↕		↕		↕	
Traffic Volume (vph)	35	25	5	20	35	70	5	380	20	40	300	30
Future Volume (vph)	35	25	5	20	35	70	5	380	20	40	300	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0		0.0		20.0		0.0		20.0	
Storage Lanes	0		0		0		1		0		1	
Taper Length (m)	2.5		2.5		2.5		2.5		2.5		2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98		0.97		0.97		0.97		1.00		0.98	
Frt	0.990		0.925		0.992		0.992		0.986		0.986	
Flt Protected	0.974		0.992		0.950		0.950		0.950		0.950	
Satd. Flow (prot)	0	1679	0	0	1616	0	1805	1846	0	1787	1828	0
Flt Permitted	0.796		0.941		0.547		0.429		0.429		0.429	
Satd. Flow (perm)	0	1353	0	0	1527	0	1005	1846	0	794	1828	0
Right Turn on Red			Yes		Yes				Yes			
Satd. Flow (RTOR)	5		76		4		10		50		50	
Link Speed (k/h)	40		40		50		50		103.0		103.0	
Link Distance (m)	95.6		60.6		165.0		103.0		7.4		7.4	
Travel Time (s)	8.6		5.5		11.9		7.4		7.4		7.4	
Confl. Peds. (#/hr)	20		15	15		20	35		25	25		35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Adj. Flow (vph)	38	27	5	22	38	76	5	413	22	43	326	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	70	0	0	136	0	5	435	0	43	359	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0		0.0		3.6		3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6		1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)	9.4		9.4		9.4		9.4		9.4		9.4	
Detector 2 Size(m)	0.6		0.6		0.6		0.6		0.6		0.6	
Detector 2 Type	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0		0.0		0.0		0.0		0.0		0.0	

Lanes, Volumes, Timings
8: Kerr Street & Stewart Street

02/28/2024

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA	NA	NA
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		24.0	24.0		6.0	24.0	
Minimum Split (s)	30.0	30.0		30.0	30.0		32.0	32.0		10.0	32.0	
Total Split (s)	30.0	30.0		30.0	30.0		35.0	35.0		10.0	45.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		46.7%	46.7%		13.3%	60.0%	
Maximum Green (s)	24.6	24.6		24.6	24.6		29.6	29.6		7.0	39.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.0	3.3	
All-Red Time (s)	2.1	2.1		2.1	2.1		2.1	2.1		0.0	2.1	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.4			5.4		5.4	5.4		3.0	5.4	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
Recall Mode	None	None		None	None		C-Min	C-Min		None	C-Min	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0		
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		14.0	14.0		14.0		
Pedestrian Calls (#/hr)	20	20		20	20		35	35		35		
Act Effect Green (s)		15.2			15.2		47.4	47.4		54.5	53.2	
Actuated g/C Ratio		0.20			0.20		0.63	0.63		0.73	0.71	
v/c Ratio		0.25			0.37		0.01	0.37		0.07	0.28	
Control Delay		23.5			14.0		12.4	12.6		5.8	7.1	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		23.5			14.0		12.4	12.6		5.8	7.1	
LOS		C			B		B	B		A	A	
Approach Delay		23.5			14.0			12.6			7.0	
Approach LOS		C			B			B			A	

Intersection Summary	
Area Type:	Other
Cycle Length:	75
Actuated Cycle Length:	75
Offset:	13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	75
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.37
Intersection Signal Delay:	11.3
Intersection Capacity Utilization:	55.9%
ICU Level of Service:	B
Analysis Period (min):	15



Timings
8: Kerr Street & Stewart Street

02/28/2024

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Lane Configurations		↕		↕	↕	↕	↕	↕				
Traffic Volume (vph)	35	25	20	35	5	380	40	300				
Future Volume (vph)	35	25	20	35	5	380	40	300				
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA				
Protected Phases		4		8		2	1	6				
Permitted Phases	4		8		2		6					
Detector Phase	4	4	8	8	2	2	1	6				
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	24.0	24.0	6.0	24.0				
Minimum Split (s)	30.0	30.0	30.0	30.0	32.0	32.0	10.0	32.0				
Total Split (s)	30.0	30.0	30.0	30.0	35.0	35.0	10.0	45.0				
Total Split (%)	40.0%	40.0%	40.0%	40.0%	46.7%	46.7%	13.3%	60.0%				
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.0	3.3				
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	2.1				
Lost Time Adjust (s)		0.0			0.0	0.0	0.0	0.0				
Total Lost Time (s)		5.4			5.4	5.4	3.0	5.4				
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Recall Mode	None	None	None	None	C-Min	C-Min	None	C-Min				
Act Effect Green (s)		15.2			15.2	47.4	47.4	54.5		53.2		
Actuated g/C Ratio		0.20			0.20	0.63	0.63	0.73		0.71		
v/c Ratio		0.25			0.37	0.01	0.37	0.07		0.28		
Control Delay		23.5			14.0	12.4	12.6	5.8		7.1		
Queue Delay		0.0			0.0	0.0	0.0	0.0		0.0		
Total Delay		23.5			14.0	12.4	12.6	5.8		7.1		
LOS		C			B	B	B	A		A		
Approach Delay		23.5			14.0		12.6	7.0				
Approach LOS		C			B		B	A				

Intersection Summary	
Cycle Length:	75
Actuated Cycle Length:	75
Offset:	13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	75
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.37
Intersection Signal Delay:	11.3
Intersection Capacity Utilization:	55.9%
ICU Level of Service:	B
Analysis Period (min):	15



Queues

8: Kerr Street & Stewart Street

02/28/2024



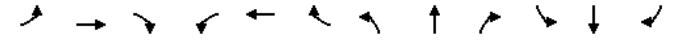
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	70	136	5	435	43	359
w/c Ratio	0.25	0.37	0.01	0.37	0.07	0.28
Control Delay	23.5	14.0	12.4	12.6	5.8	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.5	14.0	12.4	12.6	5.8	7.1
Queue Length 50th (m)	8.5	7.8	0.3	28.4	1.2	13.5
Queue Length 95th (m)	15.7	18.1	2.2	72.1	6.0	41.5
Internal Link Dist (m)	71.6	36.6		141.0		79.0
Turn Bay Length (m)			20.0		20.0	
Base Capacity (vph)	447	551	634	1167	670	1298
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced w/c Ratio	0.16	0.25	0.01	0.37	0.06	0.28

Intersection Summary

HCM Signalized Intersection Capacity Analysis

8: Kerr Street & Stewart Street

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (vph)	35	25	5	20	35	70	5	380	20	40	300	30
Future Volume (vph)	35	25	5	20	35	70	5	380	20	40	300	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.4			5.4		5.4	5.4		3.0	5.4	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00		0.97	1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	0.97	1.00	0.99	1.00		0.99	1.00	
Frt	0.99	0.92		0.92	1.00	0.99	1.00	0.99		1.00	0.99	
Flt Protected	0.97			0.99	0.99	0.95	1.00			0.95	1.00	
Satd. Flow (prot)	1656			1609	1745	1847				1774	1828	
Flt Permitted	0.80			0.94	0.55	1.00				0.43	1.00	
Satd. Flow (perm)	1354			1526	1004	1847				801	1828	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	27	5	22	38	76	5	413	22	43	326	33
RTOR Reduction (vph)	0	4	0	0	63	0	0	2	0	0	3	0
Lane Group Flow (vph)	0	66	0	0	73	0	5	433	0	43	356	0
Confl. Peds. (#/hr)	20		15	15		20	35		25	25		35
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2			1	6
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.2			13.2		44.0	44.0		51.0	51.0	
Effective Green, g (s)		13.2			13.2		44.0	44.0		51.0	51.0	
Actuated g/C Ratio		0.18			0.18		0.59	0.59		0.68	0.68	
Clearance Time (s)		5.4			5.4		5.4	5.4		3.0	5.4	
Vehicle Extension (s)		4.0			4.0		4.0	4.0		3.0	4.0	
Lane Grp Cap (vph)		238			268		589	1083		596	1243	
v/s Ratio Prot							c0.23			0.00	c0.19	
v/s Ratio Perm		c0.05			0.05		0.00			0.05		
v/c Ratio		0.28			0.27		0.01	0.40		0.07	0.29	
Uniform Delay, d1		26.8			26.8		6.4	8.4		4.3	4.8	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.9			0.8		0.0	1.1		0.1	0.6	
Delay (s)		27.6			27.5		6.5	9.5		4.4	5.3	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		27.6			27.5		9.4				5.2	
Approach LOS		C			C		A				A	

Intersection Summary

HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	13.8
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

9: Speers Internal Road 1 & Speers Road

02/28/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (vph)	1360	15	0	865	0	20
Future Volume (vph)	1360	15	0	865	0	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.998		0.865			
Flt Protected						
Satd. Flow (prot)	3603	0	0	3610	0	1644
Flt Permitted						
Satd. Flow (perm)	3603	0	0	3610	0	1644
Link Speed (k/h)	60		60		20	
Link Distance (m)	147.2		113.4		44.5	
Travel Time (s)	8.8		6.8		8.0	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1388	15	0	883	0	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1403	0	0	883	0	20
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6		3.6		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	14		24		14	
Sign Control	Free		Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	48.1%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

9: Speers Internal Road 1 & Speers Road

02/28/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (veh/h)	1360	15	0	865	0	20
Future Volume (Veh/h)	1360	15	0	865	0	20
Sign Control	Free			Stop		
Grade	0%			0%		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	1388	15	0	883	0	20
Pedestrians	1			1		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	147			347		
pX, platoon unblocked				0.79	0.80	0.79
vC, conflicting volume				1403	1838	702
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				972	1364	82
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				100	100	97
cM capacity (veh/h)				565	114	761

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	925	478	442	442	20
Volume Left	0	0	0	0	0
Volume Right	0	15	0	0	20
cSH	1700	1700	1700	1700	761
Volume to Capacity	0.54	0.28	0.26	0.26	0.03
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.6
Control Delay (s)	0.0	0.0	0.0	0.0	9.9
Lane LOS	A				
Approach Delay (s)	0.0		0.0		9.9
Approach LOS	A				

Intersection Summary

Average Delay	0.1				
Intersection Capacity Utilization	48.1%		ICU Level of Service		A
Analysis Period (min)	15				

Lanes, Volumes, Timings

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/28/2024

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	20	0	0	15	0
Future Volume (vph)	0	20	0	0	15	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected						0.950
Satd. Flow (prot)	1644	0	1900	0	0	1805
Flt Permitted						0.950
Satd. Flow (perm)	1644	0	1900	0	0	1805
Link Speed (k/h)	20		20		20	
Link Distance (m)	67.5		49.5		44.5	
Travel Time (s)	12.2		8.9		8.0	
Confl. Peds. (#/hr)	8					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	25	0	0	19	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	25	0	0	0	0	19
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	14		24	
Sign Control	Stop		Free		Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	15.7% ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/28/2024

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	20	0	0	15	0
Future Volume (Veh/h)	0	20	0	0	15	0
Sign Control	Stop		Free		Free	
Grade	0%					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	25	0	0	19	0
Pedestrians	2					
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0			1		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	40	8	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	40	8	0			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	99			
cM capacity (veh/h)	964	1072	1636			

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	25	0	19
Volume Left	0	0	19
Volume Right	25	0	0
cSH	1072	1700	1636
Volume to Capacity	0.02	0.00	0.01
Queue Length 95th (m)	0.5	0.0	0.3
Control Delay (s)	8.4	0.0	7.2
Lane LOS	A		A
Approach Delay (s)	8.4	0.0	7.2
Approach LOS	A		

Intersection Summary			
Average Delay	7.9		
Intersection Capacity Utilization	15.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
12: Underground & Speers Internal Road

02/28/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (vph)	10	10	10	0	20	30
Future Volume (vph)	10	10	10	0	20	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.932			0.919		
Flt Protected			0.950	0.981		
Satd. Flow (prot)	1771	0	0	1805	1713	0
Flt Permitted			0.950	0.981		
Satd. Flow (perm)	1771	0	0	1805	1713	0
Link Speed (k/h)	20		20	20		
Link Distance (m)	67.5		44.6	38.9		
Travel Time (s)	12.2		8.0	7.0		
Confl. Peds. (#/hr)				10		
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	13	13	13	0	25	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	26	0	0	13	63	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0		0.0	3.6		
Link Offset(m)	0.0		0.0	0.0		
Crosswalk Width(m)	1.6		1.6	1.6		
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		14	24	24	14	
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	17.2%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
12: Underground & Speers Internal Road

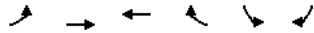
02/28/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (veh/h)	10	10	10	0	20	30
Future Volume (Veh/h)	10	10	10	0	20	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	13	13	13	0	25	38
Pedestrians	10			3		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	1			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			26		56	22
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			26		56	22
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	96
cM capacity (veh/h)			1601		941	1057
Direction, Lane #						
	EB 1	WB 1	NB 1			
Volume Total	26	13	63			
Volume Left	0	13	25			
Volume Right	13	0	38			
cSH	1700	1601	1008			
Volume to Capacity	0.02	0.01	0.06			
Queue Length 95th (m)	0.0	0.2	1.5			
Control Delay (s)	0.0	7.3	8.8			
Lane LOS		A	A			
Approach Delay (s)	0.0	7.3	8.8			
Approach LOS			A			
Intersection Summary						
Average Delay			6.4			
Intersection Capacity Utilization			17.2%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings

13: Speers Internal Road/30 Speers & Speers Internal Road 2

02/28/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↓	
Traffic Volume (vph)	40	0	0	20	5	10
Future Volume (vph)	40	0	0	20	5	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.865		0.910		
Flt Protected		0.950		0.984		
Satd. Flow (prot)	0	1504	1644	0	1575	0
Flt Permitted		0.950		0.984		
Satd. Flow (perm)	0	1504	1644	0	1575	0
Link Speed (k/h)		20	20		20	
Link Distance (m)		44.6	43.4		49.2	
Travel Time (s)		8.0	7.8		8.9	
Confl. Peds. (#/hr)	2			2	7	
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63
Heavy Vehicles (%)	20%	0%	0%	0%	0%	12%
Adj. Flow (vph)	63	0	0	32	8	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	63	32	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		24		14	24	14
Sign Control		Stop	Stop		Free	

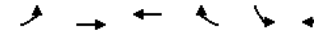
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.9%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

13: Speers Internal Road/30 Speers & Speers Internal Road 2

02/28/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↓	
Traffic Volume (veh/h)	40	0	0	20	5	10
Future Volume (Veh/h)	40	0	0	20	5	10
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63
Hourly flow rate (vph)	63	0	0	32	8	16
Pedestrians		3	7		2	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.1	1.1		1.1	
Percent Blockage		0	1		0	
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	61	34	42	9	7	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	61	34	42	9	7	
tC, single (s)	7.3	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.7	4.0	4.0	3.3	2.2	
p0 queue free %	93	100	100	97	100	
cM capacity (veh/h)	852	850	842	1070	1616	

Direction, Lane #

	EB 1	WB 1	SB 1
Volume Total	63	32	24
Volume Left	63	0	8
Volume Right	0	32	16
cSH	852	1070	1616
Volume to Capacity	0.07	0.03	0.00
Queue Length 95th (m)	1.8	0.7	0.1
Control Delay (s)	9.6	8.5	2.4
Lane LOS	A	A	A
Approach Delay (s)	9.6	8.5	2.4
Approach LOS	A	A	

Intersection Summary

Average Delay	7.8
Intersection Capacity Utilization	18.9%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/28/2024



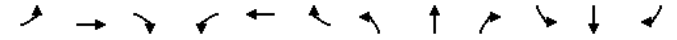
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (vph)	0	1380	0	15	840	0	25	0	40	0	0	0
Future Volume (vph)	0	1380	0	15	840	0	25	0	40	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt												
Flt Protected												
Satd. Flow (prot)	0	3539	0	0	3537	0	0	1709	0	0	1863	0
Flt Permitted												
Satd. Flow (perm)	0	3539	0	0	3537	0	0	1709	0	0	1863	0
Link Speed (k/h)	60											
Link Distance (m)	113.4			233.1			49.2			39.0		
Travel Time (s)	6.8			14.0			8.9			7.0		
Confl. Peds. (#/hr)	8			8								
Confl. Bikes (#/hr)	1											
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	2%	0%	2%	2%	2%
Adj. Flow (vph)	0	1453	0	16	884	0	26	0	42	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1453	0	0	900	0	0	68	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.6			3.6			0.0			0.0		
Link Offset(m)	0.0											
Crosswalk Width(m)	1.6			1.6			1.6			1.6		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14		24		14		24		14	
Sign Control	Free			Free			Stop			Stop		

Intersection Summary
 Area Type: Other
 Control Type: Unsignalized
 Intersection Capacity Utilization 48.7% ICU Level of Service A
 Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (veh/h)	0	1380	0	15	840	0	25	0	40	0	0	0
Future Volume (Veh/h)	0	1380	0	15	840	0	25	0	40	0	0	0
Sign Control	Free			Free			Stop			Stop		
Grade	0%											
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Hourly flow rate (vph)	0	1453	0	16	884	0	26	0	42	0	0	0
Pedestrians	4											
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	0											
Right turn flare (veh)	1											
Median type	None											
Median storage (veh)												
Upstream signal (m)	261			233								
pX, platoon unblocked	0.95			0.80			0.83			0.83		
vC, conflicting volume	884			1461			1939			2377		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	769			1079			1436			1966		
tC, single (s)	4.1			4.1			7.5			6.5		
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5			4.0		
p0 queue free %	100			97			66			100		
cM capacity (veh/h)	798			520			76			49		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	969	484	311	589	68	0
Volume Left	0	0	16	0	26	0
Volume Right	0	0	0	0	42	0
cSH	1700	1700	520	1700	168	1700
Volume to Capacity	0.57	0.28	0.03	0.35	0.40	0.00
Queue Length 95th (m)	0.0	0.0	0.7	0.0	13.6	0.0
Control Delay (s)	0.0	0.0	1.1	0.0	40.3	0.0
Lane LOS	A		E		A	
Approach Delay (s)	0.0		0.4		40.3	
Approach LOS	E		A			

Intersection Summary
 Average Delay 1.3
 Intersection Capacity Utilization 48.7% ICU Level of Service A
 Analysis Period (min) 15

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	65	580	135	300	815	510	140	155	235	295	285	60
Future Volume (vph)	65	580	135	300	815	510	140	155	235	295	285	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	105.0		0.0	75.0		100.0	50.0		45.0	80.0		75.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor	0.99		0.97	1.00		0.94	0.97		0.93	0.93		0.93
Frt		0.850				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3539	1615	1752	3539	1583	1787	1900	1599	3467	1900	1615
Flt Permitted	0.291			0.332			0.312			0.515		
Satd. Flow (perm)	548	3539	1560	610	3539	1485	567	1900	1486	1749	1900	1501
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			142			537			247			81
Link Speed (k/h)		60			60			50				50
Link Distance (m)		235.8			147.2			127.4				167.2
Travel Time (s)		14.1			8.8			9.2				12.0
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Adj. Flow (vph)	68	611	142	316	858	537	147	163	247	311	300	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	68	611	142	316	858	537	147	163	247	311	300	63
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			7.2				7.2
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		1.6			1.6			1.6				1.6
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Detector Phase	1	6	6	5	2	2	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	7.0	25.0	25.0	7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	10.0	30.9	30.9	10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3	34.3
Total Split (s)	12.0	54.0	54.0	12.0	54.0	54.0	12.0	38.0	38.0	16.0	42.0	42.0
Total Split (%)	10.0%	45.0%	45.0%	10.0%	45.0%	45.0%	10.0%	31.7%	31.7%	13.3%	35.0%	35.0%
Maximum Green (s)	9.0	48.1	48.1	9.0	48.1	48.1	9.0	31.7	31.7	13.0	35.7	35.7
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	0.0	2.2	2.2	0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.5	5.5	5.5	2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	4.0
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		14.0	14.0		14.0	14.0		14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		15	15		15	15		35	35		35	35
Act Effect Green (s)	63.2	52.8	52.8	72.5	61.2	61.2	36.3	23.1	23.1	40.1	25.2	25.2
Actuated g/C Ratio	0.53	0.44	0.44	0.60	0.51	0.51	0.30	0.19	0.19	0.33	0.21	0.21
v/c Ratio	0.19	0.39	0.19	0.63	0.48	0.53	0.54	0.45	0.51	0.41	0.75	0.17
Control Delay	12.8	24.8	4.3	19.7	21.8	3.9	35.2	45.8	8.6	29.2	56.0	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	24.8	4.3	19.7	21.8	3.9	35.2	45.8	8.6	29.2	56.0	5.4
LOS	B	C	A	B	C	A	D	D	A	C	E	A
Approach Delay		20.3			15.8			26.5				38.9
Approach LOS		C			B			C				D
Intersection Summary												
Area Type:	Other											
Cycle Length:	120											
Actuated Cycle Length:	120											
Offset:	49 (41%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green											
Natural Cycle:	90											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.75											
Intersection Signal Delay:	22.5						Intersection LOS: C					
Intersection Capacity Utilization:	78.8%						ICU Level of Service D					
Analysis Period (min):	15											
Splits and Phases:	1: Kerr Street & Speers Road											

Timings
1: Kerr Street & Speers Road

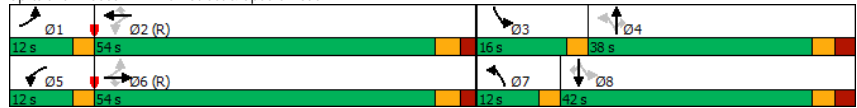
02/28/2024

	↖	→	↘	↙	←	↖	↙	↗	↘	↖	↙	↗
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↖	↖	↖↗	↖	↖	↖	↖	↖↗	↖	↖
Traffic Volume (vph)	65	580	135	300	815	510	140	155	235	295	285	60
Future Volume (vph)	65	580	135	300	815	510	140	155	235	295	285	60
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Detector Phase	1	6	6	5	2	2	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	7.0	25.0	25.0	7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	10.0	30.9	30.9	10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3	34.3
Total Split (s)	12.0	54.0	54.0	12.0	54.0	54.0	12.0	38.0	38.0	16.0	42.0	42.0
Total Split (%)	10.0%	45.0%	45.0%	10.0%	45.0%	45.0%	10.0%	31.7%	31.7%	13.3%	35.0%	35.0%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	0.0	2.2	2.2	0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
Act Effect Green (s)	63.2	52.8	52.8	72.5	61.2	61.2	36.3	23.1	23.1	40.1	25.2	25.2
Actuated g/C Ratio	0.53	0.44	0.44	0.60	0.51	0.51	0.30	0.19	0.19	0.33	0.21	0.21
v/c Ratio	0.19	0.39	0.19	0.63	0.48	0.53	0.54	0.45	0.51	0.41	0.75	0.17
Control Delay	12.8	24.8	4.3	19.7	21.8	3.9	35.2	45.8	8.6	29.2	56.0	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	24.8	4.3	19.7	21.8	3.9	35.2	45.8	8.6	29.2	56.0	5.4
LOS	B	C	A	B	C	A	D	D	A	C	E	A
Approach Delay		20.3			15.8			26.5			38.9	
Approach LOS		C			B			C			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 49 (41%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.75
 Intersection Signal Delay: 22.5 Intersection LOS: C
 Intersection Capacity Utilization 78.8% ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 1: Kerr Street & Speers Road



Queues
1: Kerr Street & Speers Road

02/28/2024

	↖	→	↘	↙	←	↖	↙	↗	↘	↖	↙	↗
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	68	611	142	316	858	537	147	163	247	311	300	63
v/c Ratio	0.19	0.39	0.19	0.63	0.48	0.53	0.54	0.45	0.51	0.41	0.75	0.17
Control Delay	12.8	24.8	4.3	19.7	21.8	3.9	35.2	45.8	8.6	29.2	56.0	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	24.8	4.3	19.7	21.8	3.9	35.2	45.8	8.6	29.2	56.0	5.4
Queue Length 50th (m)	6.5	54.5	0.0	35.5	71.1	0.0	23.8	33.6	0.0	26.1	66.8	0.0
Queue Length 95th (m)	14.1	69.7	12.1	58.1	99.5	20.4	36.5	51.5	20.1	34.3	89.2	7.2
Internal Link Dist (m)		211.8			123.2		103.4				143.2	
Turn Bay Length (m)	105.0			75.0		100.0	50.0		45.0	80.0		75.0
Base Capacity (vph)	389	1560	767	500	1804	1020	273	501	574	780	565	503
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.39	0.19	0.63	0.48	0.53	0.54	0.33	0.43	0.40	0.53	0.13

Intersection Summary

HCM Signalized Intersection Capacity Analysis

1: Kerr Street & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	65	580	135	300	815	510	140	155	235	295	285	60
Future Volume (vph)	65	580	135	300	815	510	140	155	235	295	285	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.94	1.00	1.00	0.93	1.00	1.00	0.93
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1799	3539	1560	1750	3539	1485	1773	1900	1486	3349	1900	1501
Flt Permitted	0.29	1.00	1.00	0.33	1.00	1.00	0.31	1.00	1.00	0.52	1.00	1.00
Satd. Flow (perm)	551	3539	1560	612	3539	1485	582	1900	1486	1817	1900	1501
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	68	611	142	316	858	537	147	163	247	311	300	63
RTOR Reduction (vph)	0	0	80	0	0	266	0	0	199	0	0	50
Lane Group Flow (vph)	68	611	62	316	858	271	147	163	48	311	300	13
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Actuated Green, G (s)	58.9	52.8	52.8	69.7	60.6	60.6	33.1	23.2	23.2	37.1	25.2	25.2
Effective Green, g (s)	58.9	52.8	52.8	69.7	60.6	60.6	33.1	23.2	23.2	37.1	25.2	25.2
Actuated g/C Ratio	0.49	0.44	0.44	0.58	0.51	0.51	0.28	0.19	0.19	0.31	0.21	0.21
Clearance Time (s)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Vehicle Extension (s)	2.5	5.5	5.5	2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	333	1557	686	487	1787	749	258	367	287	713	399	315
v/s Ratio Prot	0.01	0.17		c0.08	0.24		c0.05	0.09		c0.04	c0.16	
v/s Ratio Perm	0.09		0.04	c0.30		0.18	0.11		0.03	0.09		0.01
v/c Ratio	0.20	0.39	0.09	0.65	0.48	0.36	0.57	0.44	0.17	0.44	0.75	0.04
Uniform Delay, d1	16.3	22.7	19.6	13.8	19.4	18.0	34.9	42.7	40.3	31.7	44.5	37.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.7	0.3	2.6	0.9	1.4	2.3	1.2	0.4	0.3	8.3	0.1
Delay (s)	16.6	23.5	19.9	16.5	20.3	19.3	37.2	43.9	40.7	32.0	52.7	37.9
Level of Service	B	C	B	B	C	B	D	D	D	C	D	D
Approach Delay (s)		22.3			19.3			40.7			41.8	
Approach LOS		C			B			D			D	

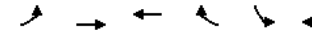
Intersection Summary		
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.69	
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	78.8%	ICU Level of Service
Analysis Period (min)	15	

c Critical Lane Group

Lanes, Volumes, Timings

2: Speers Road & Cross Avenue

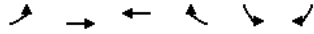
02/28/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔		↔	↔
Traffic Volume (vph)	270	820	1200	15	10	420
Future Volume (vph)	270	820	1200	15	10	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	80.0			0.0	45.0	0.0
Storage Lanes	1			0	1	2
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	0.88
Ped Bike Factor	1.00		1.00			
Frt			0.998			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1703	3610	3566	0	1805	2733
Flt Permitted	0.146				0.950	
Satd. Flow (perm)	261	3610	3566	0	1805	2733
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			1			319
Link Speed (k/h)		60	60		48	
Link Distance (m)		233.1	101.5		84.0	
Travel Time (s)		14.0	6.1		6.3	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Adj. Flow (vph)	281	854	1250	16	10	438
Shared Lane Traffic (%)						
Lane Group Flow (vph)	281	854	1266	0	10	438
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
2: Speers Road & Cross Avenue

02/28/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Detector Phase	5	2	6		4	4
Switch Phase						
Minimum Initial (s)	6.0	38.0	38.0		10.0	10.0
Minimum Split (s)	12.0	47.6	47.6		15.8	15.8
Total Split (s)	17.0	102.0	85.0		38.0	38.0
Total Split (%)	12.1%	72.9%	60.7%		27.1%	27.1%
Maximum Green (s)	11.0	95.4	78.4		32.2	32.2
Yellow Time (s)	4.0	3.7	3.7		3.3	3.3
All-Red Time (s)	2.0	2.9	2.9		2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6		5.8	5.8
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Recall Mode	None	C-Min	C-Min		None	None
Walk Time (s)		10.0	10.0			
Flash Dont Walk (s)		31.0	31.0			
Pedestrian Calls (#/hr)		5	5			
Act Effect Green (s)	114.6	114.0	86.3		13.6	13.6
Actuated g/C Ratio	0.82	0.81	0.62		0.10	0.10
v/c Ratio	0.64	0.29	0.58		0.06	0.79
Control Delay	18.2	3.7	18.1		55.1	27.6
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	18.2	3.7	18.1		55.1	27.6
LOS	B	A	B		E	C
Approach Delay		7.3	18.1		28.2	
Approach LOS		A	B		C	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 13 (9%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 15.4 Intersection LOS: B
 Intersection Capacity Utilization 72.8% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: Speers Road & Cross Avenue



Timings
2: Speers Road & Cross Avenue

02/28/2024

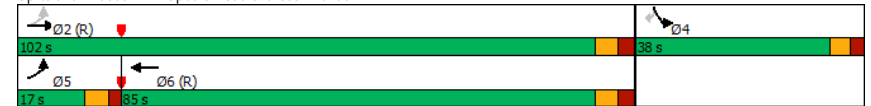


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↕↕	↕↕	↔	↕↕
Traffic Volume (vph)	270	820	1200	10	420
Future Volume (vph)	270	820	1200	10	420
Turn Type	pm+pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2				4
Detector Phase	5	2	6	4	4
Switch Phase					
Minimum Initial (s)	6.0	38.0	38.0	10.0	10.0
Minimum Split (s)	12.0	47.6	47.6	15.8	15.8
Total Split (s)	17.0	102.0	85.0	38.0	38.0
Total Split (%)	12.1%	72.9%	60.7%	27.1%	27.1%
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	None	None
Act Effect Green (s)	114.6	114.0	86.3	13.6	13.6
Actuated g/C Ratio	0.82	0.81	0.62	0.10	0.10
v/c Ratio	0.64	0.29	0.58	0.06	0.79
Control Delay	18.2	3.7	18.1	55.1	27.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.2	3.7	18.1	55.1	27.6
LOS	B	A	B	E	C
Approach Delay		7.3	18.1	28.2	
Approach LOS		A	B	C	

Intersection Summary

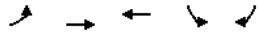
Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 13 (9%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 15.4 Intersection LOS: B
 Intersection Capacity Utilization 72.8% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: Speers Road & Cross Avenue



Queues
2: Speers Road & Cross Avenue

02/28/2024

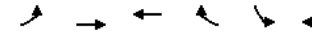


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	281	854	1266	10	438
w/c Ratio	0.64	0.29	0.58	0.06	0.79
Control Delay	18.2	3.7	18.1	55.1	27.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.2	3.7	18.1	55.1	27.6
Queue Length 50th (m)	17.8	23.4	97.9	2.6	18.1
Queue Length 95th (m)	53.2	40.2	150.2	7.8	36.9
Internal Link Dist (m)		209.1	77.5	60.0	
Turn Bay Length (m)	80.0		45.0		
Base Capacity (vph)	436	2938	2210	415	874
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.64	0.29	0.57	0.02	0.50

Intersection Summary

HCM Signalized Intersection Capacity Analysis
2: Speers Road & Cross Avenue

02/28/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕↕	↕↕		↔	↕↕
Traffic Volume (vph)	270	820	1200	15	10	420
Future Volume (vph)	270	820	1200	15	10	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.6	6.6		5.8	5.8
Lane Util. Factor	1.00	0.95	0.95		1.00	0.88
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Fr	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1703	3610	3567		1805	2733
Flt Permitted	0.15	1.00	1.00		0.95	1.00
Satd. Flow (perm)	262	3610	3567		1805	2733
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	281	854	1250	16	10	438
RTOR Reduction (vph)	0	0	0	0	0	288
Lane Group Flow (vph)	281	854	1266	0	10	150
Confl. Peds. (#/hr)	5			5		
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	114.0	114.0	86.3		13.6	13.6
Effective Green, g (s)	114.0	114.0	86.3		13.6	13.6
Actuated g/C Ratio	0.81	0.81	0.62		0.10	0.10
Clearance Time (s)	6.0	6.6	6.6		5.8	5.8
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Lane Grp Cap (vph)	436	2939	2198		175	265
v/s Ratio Prot	c0.10	0.24	0.35		0.01	
v/s Ratio Perm	c0.42					c0.05
w/c Ratio	0.64	0.29	0.58		0.06	0.57
Uniform Delay, d1	15.9	3.2	16.0		57.4	60.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.4	0.3	1.1		0.1	2.8
Delay (s)	19.3	3.4	17.1		57.5	63.1
Level of Service	B	A	B		E	E
Approach Delay (s)		7.4	17.1		63.0	
Approach LOS		A	B		E	


Intersection Summary

HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
3: St. Augustine Drive & Speers Road

02/28/2024




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕			↕				↕		↕	
Traffic Volume (vph)	10	745	25	0	995	25	5	0	25	5	0	0
Future Volume (vph)	10	745	25	0	995	25	5	0	25	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		1	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995			0.996				0.865			
Flt Protected	0.950						0.950				0.950	
Satd. Flow (prot)	1805	3553	0	0	3561	0	0	0	1644	0	1805	0
Flt Permitted	0.950						0.950				0.950	
Satd. Flow (perm)	1805	3553	0	0	3561	0	0	0	1644	0	1805	0
Link Speed (k/h)		60			60				40			30
Link Distance (m)		248.1			235.8				188.1			117.6
Travel Time (s)		14.9			14.1				16.9			14.1
Confl. Peds. (#/hr)	8		5	5		8	1		1	1		1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	10	776	26	0	1036	26	5	0	26	5	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	802	0	0	1062	0	0	5	26	0	5	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6				0.0			0.0
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		1.6			1.6				1.6			1.6
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free				Stop			Stop

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
3: St. Augustine Drive & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕			↕				↕		↕	
Traffic Volume (veh/h)	10	745	25	0	995	25	5	0	25	5	0	0
Future Volume (Veh/h)	10	745	25	0	995	25	5	0	25	5	0	0
Sign Control		Free			Free				Stop			Stop
Grade		0%			0%				0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	10	776	26	0	1036	26	5	0	26	5	0	0
Pedestrians		1			1				5			8
Lane Width (m)		3.6			3.6				3.6			3.6
Walking Speed (m/s)		1.1			1.1				1.1			1.1
Percent Blockage		0			0				0			1
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)					236							
pX, platoon unblocked	0.84						0.84	0.84		0.84	0.84	0.84
vC, conflicting volume	1070				807		1333	1884	407	1492	1884	540
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	708				807		1020	1674	407	1209	1674	78
tC, single (s)	4.1				4.1		7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2				2.2		3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99				100		97	100	96	95	100	100
cM capacity (veh/h)	752				823		159	79	596	110	79	813
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1					
Volume Total	10	517	285	691	371	31	5					
Volume Left	10	0	0	0	0	5	5					
Volume Right	0	0	26	0	26	26	0					
cSH	752	1700	1700	1700	1700	413	110					
Volume to Capacity	0.01	0.30	0.17	0.41	0.22	0.08	0.05					
Queue Length 95th (m)	0.3	0.0	0.0	0.0	0.0	1.8	1.1					
Control Delay (s)	9.8	0.0	0.0	0.0	0.0	14.4	39.2					
Lane LOS	A					B	E					
Approach Delay (s)	0.1				0.0	14.4	39.2					
Approach LOS						B	E					
Intersection Summary												
Average Delay					0.4							
Intersection Capacity Utilization					Err%	ICU Level of Service				H		
Analysis Period (min)					15							

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

02/28/2024

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙		↑	↗	↘	↓
Traffic Volume (vph)	100	150	600	125	170	540
Future Volume (vph)	100	150	600	125	170	540
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0	0.0		50.0	50.0	
Storage Lanes	0	0		1	1	
Taper Length (m)	2.5			2.5		
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor	0.98			0.97	1.00	
Frt	0.919			0.850		
Flt Protected	0.980			0.950		
Satd. Flow (prot)	1663	0	3574	1583	1805	3574
Flt Permitted	0.980			0.301		
Satd. Flow (perm)	1654	0	3574	1540	570	3574
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	91			129		
Link Speed (k/h)	50		50		50	
Link Distance (m)	265.3		167.2		94.4	
Travel Time (s)	19.1		12.0		6.8	
Confl. Peds. (#/hr)	13	6		4	4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	1%	1%	2%	0%	1%
Adj. Flow (vph)	103	155	619	129	175	557
Shared Lane Traffic (%)						
Lane Group Flow (vph)	258	0	619	129	175	557
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1		2	1	1	2
Detector Template	Left		Thru	Right	Left	Thru
Leading Detector (m)	2.0		10.0	2.0	2.0	10.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0		0.6	2.0	2.0	0.6
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)			9.4		9.4	
Detector 2 Size(m)			0.6		0.6	
Detector 2 Type			Cl+Ex		Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)			0.0		0.0	

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

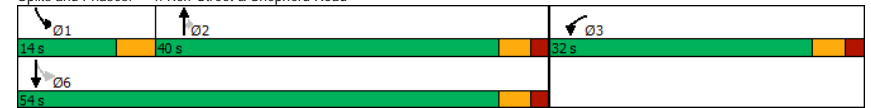
02/28/2024

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Turn Type	Prot		NA	Perm	pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases				2	6	
Detector Phase	3		2	2	1	6
Switch Phase						
Minimum Initial (s)	10.0		18.0	18.0	7.0	18.0
Minimum Split (s)	31.4		28.2	28.2	11.0	28.2
Total Split (s)	32.0		40.0	40.0	14.0	54.0
Total Split (%)	37.2%		46.5%	46.5%	16.3%	62.8%
Maximum Green (s)	26.6		34.8	34.8	10.0	48.8
Yellow Time (s)	3.3		3.3	3.3	4.0	3.3
All-Red Time (s)	2.1		1.9	1.9	0.0	1.9
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4		5.2	5.2	4.0	5.2
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0		3.5	3.5	2.5	3.5
Recall Mode	None		Min	Min	None	Min
Walk Time (s)	10.0		10.0	10.0		10.0
Flash Dont Walk (s)	16.0		13.0	13.0		13.0
Pedestrian Calls (#/hr)	0		5	5		5
Act Effect Green (s)	12.2		19.1	19.1	32.3	31.1
Actuated g/C Ratio	0.23		0.35	0.35	0.60	0.58
v/c Ratio	0.58		0.49	0.21	0.34	0.27
Control Delay	17.9		15.8	4.3	7.2	6.5
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	17.9		15.8	4.3	7.2	6.5
LOS	B		B	A	A	A
Approach Delay	17.9		13.8			6.7
Approach LOS	B		B			A

Intersection Summary

Area Type: Other
 Cycle Length: 86
 Actuated Cycle Length: 54
 Natural Cycle: 75
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 11.4
 Intersection Capacity Utilization 54.8%
 Intersection LOS: B
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 4: Kerr Street & Shepherd Road



Timings

4: Kerr Street & Shepherd Road

02/28/2024

	↙	↑	↘	↙	↓
Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Configurations	↘ ↙	↑ ↑	↘ ↙	↘ ↙	↑ ↑
Traffic Volume (vph)	100	600	125	170	540
Future Volume (vph)	100	600	125	170	540
Turn Type	Prot	NA	Perm	pm+pt	NA
Protected Phases	3	2		1	6
Permitted Phases			2	6	
Detector Phase	3	2	2	1	6
Switch Phase					
Minimum Initial (s)	10.0	18.0	18.0	7.0	18.0
Minimum Split (s)	31.4	28.2	28.2	11.0	28.2
Total Split (s)	32.0	40.0	40.0	14.0	54.0
Total Split (%)	37.2%	46.5%	46.5%	16.3%	62.8%
Yellow Time (s)	3.3	3.3	3.3	4.0	3.3
All-Red Time (s)	2.1	1.9	1.9	0.0	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	5.2	5.2	4.0	5.2
Lead/Lag		Lag	Lag	Lead	Lead
Lead-Lag Optimize?		Yes	Yes	Yes	
Recall Mode	None	Min	Min	None	Min
Act Effct Green (s)	12.2	19.1	19.1	32.3	31.1
Actuated g/C Ratio	0.23	0.35	0.35	0.60	0.58
v/c Ratio	0.58	0.49	0.21	0.34	0.27
Control Delay	17.9	15.8	4.3	7.2	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.9	15.8	4.3	7.2	6.5
LOS	B	B	A	A	A
Approach Delay	17.9	13.8			6.7
Approach LOS	B	B			A

Intersection Summary

Cycle Length: 86
 Actuated Cycle Length: 54
 Natural Cycle: 75
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 11.4
 Intersection Capacity Utilization 54.8%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 4: Kerr Street & Shepherd Road



Queues

4: Kerr Street & Shepherd Road

02/28/2024

	↙	↑	↘	↙	↓
Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	258	619	129	175	557
v/c Ratio	0.58	0.49	0.21	0.34	0.27
Control Delay	17.9	15.8	4.3	7.2	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.9	15.8	4.3	7.2	6.5
Queue Length 50th (m)	13.3	22.2	0.0	5.8	11.2
Queue Length 95th (m)	35.6	43.7	9.3	16.2	24.0
Internal Link Dist (m)	241.3	143.2			70.4
Turn Bay Length (m)	30.0		50.0	50.0	
Base Capacity (vph)	874	2328	1048	572	3264
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.30	0.27	0.12	0.31	0.17

Intersection Summary

HCM Signalized Intersection Capacity Analysis

4: Kerr Street & Shepherd Road

02/28/2024

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↑↑	↔	↔	↑↑
Traffic Volume (vph)	100	150	600	125	170	540
Future Volume (vph)	100	150	600	125	170	540
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4		5.2	5.2	4.0	5.2
Lane Util. Factor	1.00		0.95	1.00	1.00	0.95
Flpb, ped/bikes	0.99		1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.92		1.00	0.85	1.00	1.00
Flt Protected	0.98		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1666		3574	1544	1804	3574
Flt Permitted	0.98		1.00	1.00	0.30	1.00
Satd. Flow (perm)	1666		3574	1544	572	3574
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	103	155	619	129	175	557
RTOR Reduction (vph)	70	0	0	83	0	0
Lane Group Flow (vph)	188	0	619	46	175	557
Confl. Peds. (#/hr)	13	6		4	4	
Heavy Vehicles (%)	3%	1%	1%	2%	0%	1%
Turn Type	Prot		NA	Perm	pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases				2	6	
Actuated Green, G (s)	12.2		19.2	19.2	31.1	31.1
Effective Green, g (s)	12.2		19.2	19.2	31.1	31.1
Actuated g/C Ratio	0.23		0.36	0.36	0.58	0.58
Clearance Time (s)	5.4		5.2	5.2	4.0	5.2
Vehicle Extension (s)	3.0		3.5	3.5	2.5	3.5
Lane Grp Cap (vph)	377		1273	549	510	2062
v/s Ratio Prot	c0.11		c0.17		c0.05	0.16
v/s Ratio Perm				0.03	0.15	
v/c Ratio	0.50		0.49	0.08	0.34	0.27
Uniform Delay, d1	18.2		13.5	11.5	5.8	5.7
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0		0.3	0.1	0.3	0.1
Delay (s)	19.2		13.9	11.6	6.1	5.8
Level of Service	B		B	B	A	A
Approach Delay (s)	19.2		13.5			5.9
Approach LOS	B		B			A

Intersection Summary			
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	53.9	Sum of lost time (s)	14.6
Intersection Capacity Utilization	54.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

5: Kerr Street & Wycroft Road

02/28/2024

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↑↑	↑↑	↔
Traffic Volume (vph)	25	135	115	635	575	110
Future Volume (vph)	25	135	115	635	575	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	75.0	0.0	75.0			0.0
Storage Lanes	1	1	1			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850			0.976	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1553	1703	3610	3501	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1553	1703	3610	3501	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	561.6			394.3	98.1	
Travel Time (s)	40.4			28.4	7.1	
Confl. Peds. (#/hr)			5			5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	4%	6%	0%	0%	4%
Adj. Flow (vph)	27	144	122	676	612	117
Shared Lane Traffic (%)						
Lane Group Flow (vph)	27	144	122	676	729	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	39.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

5: Kerr Street & Wycroft Road

02/28/2024

Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Volume (veh/h)	25	135	115	635	575	110	
Future Volume (Veh/h)	25	135	115	635	575	110	
Sign Control	Stop		Free				
Grade	0%		0%				
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	
Hourly flow rate (vph)	27	144	122	676	612	117	
Pedestrians	5						
Lane Width (m)	3.6						
Walking Speed (m/s)	1.1						
Percent Blockage	0						
Right turn flare (veh)							
Median type			None		None		
Median storage (veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	1258	370	734				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1258	370	734				
tC, single (s)	6.8	7.0	4.2				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.3				
p0 queue free %	81	77	85				
cM capacity (veh/h)	141	619	837				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	27	144	122	338	338	408	321
Volume Left	27	0	122	0	0	0	0
Volume Right	0	144	0	0	0	0	117
cSH	141	619	837	1700	1700	1700	1700
Volume to Capacity	0.19	0.23	0.15	0.20	0.20	0.24	0.19
Queue Length 95th (m)	5.2	6.8	3.9	0.0	0.0	0.0	0.0
Control Delay (s)	36.5	12.6	10.0	0.0	0.0	0.0	0.0
Lane LOS	E	B	B				
Approach Delay (s)	16.3		1.5	0.0			
Approach LOS	C						
Intersection Summary							
Average Delay			2.4				
Intersection Capacity Utilization			39.2%		ICU Level of Service		A
Analysis Period (min)	15						

Lanes, Volumes, Timings

6: Kerr Street & Prince Charles Drive

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	10	0	10	10	0	30	5	495	10	20	670	25	
Future Volume (vph)	10	0	10	10	0	30	5	495	10	20	670	25	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt	0.932		0.900		0.997		0.995						
Flt Protected	0.976		0.987		0.999		0.999						
Satd. Flow (prot)	0	1728	0	0	1688	0	0	1873	0	0	1849	0	
Flt Permitted	0.976		0.987		0.999		0.999						
Satd. Flow (perm)	0	1728	0	0	1688	0	0	1873	0	0	1849	0	
Link Speed (k/h)	40		40		50		50						
Link Distance (m)	57.8		56.0		134.8		127.4						
Travel Time (s)	5.2		5.0		9.7		9.2						
Confl. Peds. (#/hr)	4	1		1		4	21	31		31		21	
Confl. Bikes (#/hr)									1	1			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Heavy Vehicles (%)	0%	50%	0%	0%	0%	0%	20%	1%	0%	5%	2%	4%	
Adj. Flow (vph)	11	0	11	11	0	32	5	521	11	21	705	26	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	22	0	0	43	0	0	537	0	0	752	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)	0.0		0.0		0.0		0.0		3.6				
Link Offset(m)	0.0		0.0		0.0		0.0		0.0				
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6				
Two way Left Turn Lane													
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (k/h)	24	14		24		14		24		14		24	
Sign Control	Stop		Stop		Free		Free		Free				
Intersection Summary													
Area Type:	Other												
Control Type:	Unsignalized												
Intersection Capacity Utilization	60.7%						ICU Level of Service B						
Analysis Period (min)	15												

HCM Unsignalized Intersection Capacity Analysis

6: Kerr Street & Prince Charles Drive

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	10	0	10	10	0	30	5	495	10	20	670	25
Future Volume (Veh/h)	10	0	10	10	0	30	5	495	10	20	670	25
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	0	11	11	0	32	5	521	11	21	705	26
Pedestrians	21			31			1			4		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	2			3			0			0		
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (m)							238					
pX, platoon unblocked	0.79	0.79	0.75	0.79	0.79	0.90	0.75					0.90
vC, conflicting volume	1354	1354	740	1340	1362	562	752					563
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1041	1042	480	1024	1051	461	496					463
tC, single (s)	7.1	7.0	6.2	7.1	6.5	6.2	4.3					4.1
tC, 2 stage (s)												
tF (s)	3.5	4.5	3.3	3.5	4.0	3.3	2.4					2.2
p0 queue free %	92	100	97	93	100	94	99					98
cM capacity (veh/h)	144	139	431	153	168	529	717					951
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	22	43	537	752								
Volume Left	11	11	5	21								
Volume Right	11	32	11	26								
cSH	216	324	717	951								
Volume to Capacity	0.10	0.13	0.01	0.02								
Queue Length 95th (m)	2.5	3.4	0.2	0.5								
Control Delay (s)	23.5	17.8	0.2	0.6								
Lane LOS	C	C	A	A								
Approach Delay (s)	23.5	17.8	0.2	0.6								
Approach LOS	C	C										
Intersection Summary												
Average Delay				1.3								
Intersection Capacity Utilization				60.7%	ICU Level of Service							B
Analysis Period (min)				15								

Lanes, Volumes, Timings

7: Kerr Street & Elmwood Road

02/28/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	15	10	5	495	650	40
Future Volume (vph)	15	10	5	495	650	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.945				0.992	
Fit Protected	0.971					
Satd. Flow (prot)	1675	0	0	1860	1843	0
Fit Permitted	0.971					
Satd. Flow (perm)	1675	0	0	1860	1843	0
Link Speed (k/h)	40					
Link Distance (m)	171.2				103.0	134.8
Travel Time (s)	15.4				7.4	9.7
Confl. Peds. (#/hr)	1	2	34			34
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	10%	20%	2%	2%	7%
Adj. Flow (vph)	16	11	5	521	684	42
Shared Lane Traffic (%)						
Lane Group Flow (vph)	27	0	0	526	726	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6				3.6	3.6
Link Offset(m)	0.0				0.0	0.0
Crosswalk Width(m)	1.6				1.6	1.6
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24	14		
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	47.5%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

7: Kerr Street & Elmwood Road

02/28/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔		
Traffic Volume (veh/h)	15	10	5	495	650	40
Future Volume (Veh/h)	15	10	5	495	650	40
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	11	5	521	684	42
Pedestrians	34		2		1	
Lane Width (m)	3.6		3.6		3.6	
Walking Speed (m/s)	1.1		1.1		1.1	
Percent Blockage	3		0		0	
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)			103		262	
pX, platoon unblocked	0.83	0.77	0.77			
vC, conflicting volume	1271	741	760			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	903	519	544			
tC, single (s)	6.4	6.3	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.4			
p0 queue free %	94	97	99			
cM capacity (veh/h)	249	405	705			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	27	526	726			
Volume Left	16	5	0			
Volume Right	11	0	42			
cSH	295	705	1700			
Volume to Capacity	0.09	0.01	0.43			
Queue Length 95th (m)	2.3	0.2	0.0			
Control Delay (s)	18.4	0.2	0.0			
Lane LOS	C	A				
Approach Delay (s)	18.4	0.2	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			47.5%		ICU Level of Service A	
Analysis Period (min)	15					

Lanes, Volumes, Timings

8: Kerr Street & Stewart Street

02/28/2024



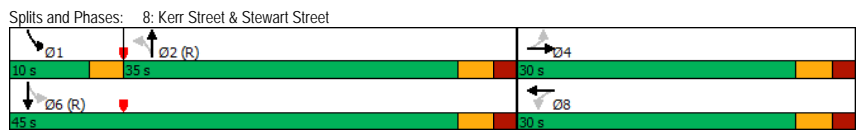
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Volume (vph)	50	10	15	10	15	75	10	375	15	55	555	50
Future Volume (vph)	50	10	15	10	15	75	10	375	15	55	555	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0		0.0		20.0		0.0		20.0	
Storage Lanes	0		0		0		1		0		1	
Taper Length (m)	2.5		2.5		2.5		2.5		2.5		2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.97		0.96		0.98		0.98		0.98		0.99	
Frt	0.973		0.898		0.994		0.988		0.988		0.988	
Flt Protected	0.968		0.995		0.950		0.950		0.950		0.950	
Satd. Flow (prot)	0	1705	0	0	1577	0	1805	1855	0	1787	1832	0
Flt Permitted	0.771		0.967		0.404		0.436		0.436		0.436	
Satd. Flow (perm)	0	1333	0	0	1530	0	752	1855	0	807	1832	0
Right Turn on Red			Yes		Yes		Yes				Yes	
Satd. Flow (RTOR)	16		82		3		9				9	
Link Speed (k/h)	40		40		50		50				50	
Link Distance (m)	95.6		60.6		165.0		103.0				103.0	
Travel Time (s)	8.6		5.5		11.9		7.4				7.4	
Confl. Peds. (#/hr)	20		15		15		20		35		25	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Adj. Flow (vph)	54	11	16	11	16	82	11	408	16	60	603	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	81	0	0	109	0	11	424	0	60	657	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0		0.0		3.6		3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6		1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24	14	24	14	24	14	24	14	24	14
Number of Detectors	1	2	1	2	1	2	1	2	1	2	1	2
Detector Template	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left	Thru
Leading Detector (m)	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4		9.4		9.4		9.4		9.4		9.4	
Detector 2 Size(m)	0.6		0.6		0.6		0.6		0.6		0.6	
Detector 2 Type	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0		0.0		0.0		0.0		0.0		0.0	

Lanes, Volumes, Timings
8: Kerr Street & Stewart Street

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA	NA	NA
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		24.0	24.0		6.0	24.0	
Minimum Split (s)	30.0	30.0		30.0	30.0		32.0	32.0		10.0	32.0	
Total Split (s)	30.0	30.0		30.0	30.0		35.0	35.0		10.0	45.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		46.7%	46.7%		13.3%	60.0%	
Maximum Green (s)	24.6	24.6		24.6	24.6		29.6	29.6		7.0	39.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.0	3.3	
All-Red Time (s)	2.1	2.1		2.1	2.1		2.1	2.1		0.0	2.1	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.4			5.4		5.4	5.4		3.0	5.4	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
Recall Mode	None	None		None	None		C-Min	C-Min		None	C-Min	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0		
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		14.0	14.0		14.0		
Pedestrian Calls (#/hr)	20	20		20	20		35	35		35		
Act Effect Green (s)		15.2			15.2		47.1	47.1		54.5	53.2	
Actuated g/C Ratio		0.20			0.20		0.63	0.63		0.73	0.71	
v/c Ratio		0.29			0.29		0.02	0.36		0.09	0.50	
Control Delay		21.5			9.9		12.7	12.7		5.9	9.8	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		21.5			9.9		12.7	12.7		5.9	9.8	
LOS		C			A		B	B		A	A	
Approach Delay		21.5			9.9		12.7	12.7		9.5		
Approach LOS		C			A		B	B		A		

Intersection Summary	
Area Type:	Other
Cycle Length:	75
Actuated Cycle Length:	75
Offset:	13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	75
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.50
Intersection Signal Delay:	11.3
Intersection Capacity Utilization:	69.0%
ICU Level of Service:	C
Intersection LOS:	B
Analysis Period (min):	15



Timings
8: Kerr Street & Stewart Street

02/28/2024

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔		↔	↔	↔	↔	↔
Traffic Volume (vph)	50	10	10	15	10	375	55	555
Future Volume (vph)	50	10	10	15	10	375	55	555
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	24.0	24.0	6.0	24.0
Minimum Split (s)	30.0	30.0	30.0	30.0	32.0	32.0	10.0	32.0
Total Split (s)	30.0	30.0	30.0	30.0	35.0	35.0	10.0	45.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	46.7%	46.7%	13.3%	60.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.0	3.3
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	2.1
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.4		5.4	5.4	5.4	3.0	5.4
Lead/Lag					Lag	Lag	Lead	Lead
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effect Green (s)		15.2		15.2	47.1	47.1	54.5	53.2
Actuated g/C Ratio		0.20		0.20	0.63	0.63	0.73	0.71
v/c Ratio		0.29		0.29	0.02	0.36	0.09	0.50
Control Delay		21.5		9.9	12.7	12.7	5.9	9.8
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		21.5		9.9	12.7	12.7	5.9	9.8
LOS		C		A	B	B	A	A
Approach Delay		21.5		9.9	12.7	12.7	9.5	
Approach LOS		C		A	B	B	A	

Intersection Summary	
Cycle Length:	75
Actuated Cycle Length:	75
Offset:	13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	75
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.50
Intersection Signal Delay:	11.3
Intersection Capacity Utilization:	69.0%
ICU Level of Service:	C
Intersection LOS:	B
Analysis Period (min):	15



Queues

8: Kerr Street & Stewart Street

02/28/2024



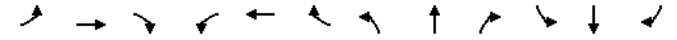
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	81	109	11	424	60	657
w/c Ratio	0.29	0.29	0.02	0.36	0.09	0.50
Control Delay	21.5	9.9	12.7	12.7	5.9	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.5	9.9	12.7	12.7	5.9	9.8
Queue Length 50th (m)	8.5	3.4	0.6	27.5	1.6	31.4
Queue Length 95th (m)	16.4	13.0	3.8	70.8	7.7	92.8
Internal Link Dist (m)	71.6	36.6		141.0		79.0
Turn Bay Length (m)			20.0		20.0	
Base Capacity (vph)	447	556	472	1167	680	1301
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced w/c Ratio	0.18	0.20	0.02	0.36	0.09	0.50

Intersection Summary

HCM Signalized Intersection Capacity Analysis

8: Kerr Street & Stewart Street

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (vph)	50	10	15	10	15	75	10	375	15	55	555	50
Future Volume (vph)	50	10	15	10	15	75	10	375	15	55	555	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.4		5.4	5.4		3.0	5.4	
Lane Util. Factor	1.00				1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	0.99				0.96		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.98				1.00		0.98	1.00		0.99	1.00	
Frt	0.97				0.90		1.00	0.99		1.00	0.99	
Flt Protected	0.97				0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1675				1575		1766	1855		1774	1832	
Flt Permitted	0.77				0.97		0.40	1.00		0.44	1.00	
Satd. Flow (perm)	1334				1530		751	1855		813	1832	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	11	16	11	16	82	11	408	16	60	603	54
RTOR Reduction (vph)	0	13	0	0	68	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	68	0	0	41	0	11	423	0	60	654	0
Confl. Peds. (#/hr)	20		15	15		20	35		25	25		35
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.2			13.2		43.8	43.8		51.0	51.0	
Effective Green, g (s)		13.2			13.2		43.8	43.8		51.0	51.0	
Actuated g/C Ratio		0.18			0.18		0.58	0.58		0.68	0.68	
Clearance Time (s)		5.4			5.4		5.4	5.4		3.0	5.4	
Vehicle Extension (s)		4.0			4.0		4.0	4.0		3.0	4.0	
Lane Grp Cap (vph)		234			269		438	1083		606	1245	
v/s Ratio Prot							0.23			0.01	c0.36	
v/s Ratio Perm		c0.05			0.03		0.01			0.06		
v/c Ratio		0.29			0.15		0.03	0.39		0.10	0.53	
Uniform Delay, d1		26.8			26.2		6.6	8.4		4.3	6.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.9			0.4		0.1	1.1		0.1	1.6	
Delay (s)		27.8			26.5		6.7	9.5		4.4	7.6	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		27.8			26.5		9.4			7.3		
Approach LOS		C			C		A			A		

Intersection Summary

HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	13.8
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

9: Speers Internal Road 1 & Speers Road

02/28/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (vph)	1055	60	0	1625	0	20
Future Volume (vph)	1055	60	0	1625	0	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.992					0.865
Flt Protected						
Satd. Flow (prot)	3581	0	0	3610	0	1644
Flt Permitted						
Satd. Flow (perm)	3581	0	0	3610	0	1644
Link Speed (k/h)	60			60	20	
Link Distance (m)	147.2			113.4	44.5	
Travel Time (s)	8.8			6.8	8.0	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1077	61	0	1658	0	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1138	0	0	1658	0	20
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	48.3%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

9: Speers Internal Road 1 & Speers Road

02/28/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (veh/h)	1055	60	0	1625	0	20
Future Volume (Veh/h)	1055	60	0	1625	0	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	1077	61	0	1658	0	20
Pedestrians	1			1		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	147			347		
pX, platoon unblocked			0.82		0.88	0.82
vC, conflicting volume			1138		1938	570
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			721		850	26
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			727		266	858

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	718	420	829	829	20
Volume Left	0	0	0	0	0
Volume Right	0	61	0	0	20
cSH	1700	1700	1700	1700	858
Volume to Capacity	0.42	0.25	0.49	0.49	0.02
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.5
Control Delay (s)	0.0	0.0	0.0	0.0	9.3
Lane LOS					A
Approach Delay (s)	0.0		0.0		9.3
Approach LOS					A

Intersection Summary

Average Delay	0.1
Intersection Capacity Utilization	48.3%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/28/2024

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	0	20	0	0	55	5
Future Volume (vph)	0	20	0	0	55	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected						0.956
Satd. Flow (prot)	1644	0	1900	0	0	1816
Flt Permitted						0.956
Satd. Flow (perm)	1644	0	1900	0	0	1816
Link Speed (k/h)	20		20		20	
Link Distance (m)	67.5		49.5		44.5	
Travel Time (s)	12.2		8.9		8.0	
Confl. Peds. (#/hr)	8					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	25	0	0	70	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	25	0	0	0	0	76
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	14		24	
Sign Control	Stop		Free		Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	15.7% ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/28/2024

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	0	20	0	0	55	5
Future Volume (Veh/h)	0	20	0	0	55	5
Sign Control	Stop		Free		Free	
Grade	0%					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	25	0	0	70	6
Pedestrians	2					
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0					1
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	148	8	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	148	8	0			
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			96	
cM capacity (veh/h)	811	1072			1636	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	25	0	76
Volume Left	0	0	70
Volume Right	25	0	0
cSH	1072	1700	1636
Volume to Capacity	0.02	0.00	0.04
Queue Length 95th (m)	0.5	0.0	1.0
Control Delay (s)	8.4	0.0	6.7
Lane LOS	A		A
Approach Delay (s)	8.4	0.0	6.7
Approach LOS	A		

Intersection Summary			
Average Delay	7.2		
Intersection Capacity Utilization	15.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
12: Underground & Speers Internal Road

02/28/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (vph)	25	25	20	10	15	10
Future Volume (vph)	25	25	20	10	15	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.932			0.945		
Flt Protected			0.968	0.971		
Satd. Flow (prot)	1771	0	0	1839	1743	0
Flt Permitted			0.968	0.971		
Satd. Flow (perm)	1771	0	0	1839	1743	0
Link Speed (k/h)	20		20	20		
Link Distance (m)	67.5		44.6	38.9		
Travel Time (s)	12.2		8.0	7.0		
Confl. Peds. (#/hr)				10		
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	32	32	25	13	19	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	64	0	0	38	32	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0		0.0	3.6		
Link Offset(m)	0.0		0.0	0.0		
Crosswalk Width(m)	1.6		1.6	1.6		
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		14	24	24	24	14
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	18.3%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
12: Underground & Speers Internal Road

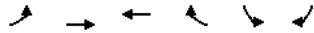
02/28/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (veh/h)	25	25	20	10	15	10
Future Volume (Veh/h)	25	25	20	10	15	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	32	32	25	13	19	13
Pedestrians	10			3		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	1			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			64		121	51
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			64		121	51
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		98	99
cM capacity (veh/h)			1551		857	1020
Direction, Lane #						
	EB 1	WB 1	NB 1			
Volume Total	64	38	32			
Volume Left	0	25	19			
Volume Right	32	0	13			
cSH	1700	1551	917			
Volume to Capacity	0.04	0.02	0.03			
Queue Length 95th (m)	0.0	0.4	0.8			
Control Delay (s)	0.0	4.9	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	4.9	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			3.6			
Intersection Capacity Utilization	18.3%		ICU Level of Service A			
Analysis Period (min)	15					

Lanes, Volumes, Timings

13: Speers Internal Road/30 Speers & Speers Internal Road 2

02/28/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↓	
Traffic Volume (vph)	15	20	0	10	0	30
Future Volume (vph)	15	20	0	10	0	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.865		0.865	
Flt Protected		0.979				
Satd. Flow (prot)	0	1713	1644	0	1467	0
Flt Permitted		0.979				
Satd. Flow (perm)	0	1713	1644	0	1467	0
Link Speed (k/h)		20	20		20	
Link Distance (m)		44.6	43.4		49.2	
Travel Time (s)		8.0	7.8		8.9	
Confl. Peds. (#/hr)	2			2	7	
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63
Heavy Vehicles (%)	20%	0%	0%	0%	0%	12%
Adj. Flow (vph)	24	32	0	16	0	48
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	56	16	0	48	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		24		14	24	14
Sign Control		Stop	Stop		Free	

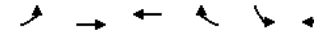
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.5%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

13: Speers Internal Road/30 Speers & Speers Internal Road 2

02/28/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↓	
Traffic Volume (veh/h)	15	20	0	10	0	30
Future Volume (Veh/h)	15	20	0	10	0	30
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63
Hourly flow rate (vph)	24	32	0	16	0	48
Pedestrians		3	7		2	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.1	1.1		1.1	
Percent Blockage		0	1		0	
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	45	34	58	9	7	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	45	34	58	9	7	
tC, single (s)	7.3	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.7	4.0	4.0	3.3	2.2	
p0 queue free %	97	96	100	99	100	
cM capacity (veh/h)	890	855	829	1070	1616	

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	56	16	48
Volume Left	24	0	0
Volume Right	0	16	48
cSH	869	1070	1616
Volume to Capacity	0.06	0.01	0.00
Queue Length 95th (m)	1.6	0.3	0.0
Control Delay (s)	9.4	8.4	0.0
Lane LOS	A	A	
Approach Delay (s)	9.4	8.4	0.0
Approach LOS	A	A	

Intersection Summary

Average Delay		5.5	
Intersection Capacity Utilization	18.5%		ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (vph)	0	1075	5	25	1600	0	20	0	10	5	0	5
Future Volume (vph)	0	1075	5	25	1600	0	20	0	10	5	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999						0.954			0.932	
Flt Protected					0.999			0.968			0.976	
Satd. Flow (prot)	0	3536	0	0	3537	0	0	1755	0	0	1694	0
Flt Permitted					0.999			0.968			0.976	
Satd. Flow (perm)	0	3536	0	0	3537	0	0	1755	0	0	1694	0
Link Speed (k/h)		60			60			20			20	
Link Distance (m)		113.4			233.1			49.2			39.0	
Travel Time (s)		6.8			14.0			8.9			7.0	
Confl. Peds. (#/hr)			8	8								
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	2%	0%	2%	2%	2%
Adj. Flow (vph)	0	1132	5	26	1684	0	21	0	11	5	0	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1137	0	0	1710	0	0	32	0	0	10	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	71.9%
ICU Level of Service	C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (veh/h)	0	1075	5	25	1600	0	20	0	10	5	0	5
Future Volume (Veh/h)	0	1075	5	25	1600	0	20	0	10	5	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Hourly flow rate (vph)	0	1132	5	26	1684	0	21	0	11	5	0	5
Pedestrians		4			4			8				
Lane Width (m)		3.6			3.6			3.6				
Walking Speed (m/s)		1.1			1.1			1.1				
Percent Blockage		0			0			1				
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		261			233							
pX, platoon unblocked	0.78			0.84			0.86	0.86	0.84	0.86	0.86	0.78
vC, conflicting volume	1684			1145			2046	2878	580	2317	2881	846
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1315			798			1065	2034	128	1381	2036	242
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			86	100	99	94	100	99
cM capacity (veh/h)	407			697			146	46	754	84	46	590

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	755	382	587	1123	32	10
Volume Left	0	0	26	0	21	5
Volume Right	0	5	0	0	11	5
cSH	1700	1700	697	1700	202	148
Volume to Capacity	0.44	0.22	0.04	0.66	0.16	0.07
Queue Length 95th (m)	0.0	0.0	0.9	0.0	4.2	1.6
Control Delay (s)	0.0	0.0	1.0	0.0	26.1	31.1
Lane LOS			A		D	D
Approach Delay (s)	0.0		0.3		26.1	31.1
Approach LOS			D		D	

Intersection Summary

Average Delay	0.6
Intersection Capacity Utilization	71.9%
ICU Level of Service	C
Analysis Period (min)	15

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	80	690	95	185	535	180	105	125	370	370	190	70
Future Volume (vph)	80	690	95	185	535	180	105	125	370	370	190	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	105.0		0.0	75.0		100.0	50.0		45.0	80.0		75.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor	0.98		0.97	1.00		0.94	0.95		0.93	0.92		0.93
Frt		0.850				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3539	1615	1752	3539	1583	1787	1900	1599	3467	1900	1615
Flt Permitted	0.428			0.280			0.632			0.548		
Satd. Flow (perm)	797	3539	1560	515	3539	1485	1135	1900	1486	1847	1900	1501
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			112			189			239			81
Link Speed (k/h)		60			60			50				50
Link Distance (m)		235.8			147.2			127.4				167.2
Travel Time (s)		14.1			8.8			9.2				12.0
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Adj. Flow (vph)	84	726	100	195	563	189	111	132	389	389	200	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	84	726	100	195	563	189	111	132	389	389	200	74
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			7.2				7.2
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		1.6			1.6			1.6				1.6
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Detector Phase	1	6	6	5	2	2	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	7.0	25.0	25.0	7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	10.0	30.9	30.9	10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3	34.3
Total Split (s)	11.0	42.0	42.0	14.0	45.0	45.0	11.0	40.0	40.0	24.0	53.0	53.0
Total Split (%)	9.2%	35.0%	35.0%	11.7%	37.5%	37.5%	9.2%	33.3%	33.3%	20.0%	44.2%	44.2%
Maximum Green (s)	8.0	36.1	36.1	11.0	39.1	39.1	8.0	33.7	33.7	21.0	46.7	46.7
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	0.0	2.2	2.2	0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.5	5.5	5.5	2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	4.0
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		14.0	14.0		14.0	14.0		14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		15	15		15	15		35	35		35	35
Act Effect Green (s)	65.7	54.7	54.7	71.7	59.9	59.9	33.4	21.3	21.3	42.1	27.0	27.0
Actuated g/C Ratio	0.55	0.46	0.46	0.60	0.50	0.50	0.28	0.18	0.18	0.35	0.22	0.22
v/c Ratio	0.17	0.45	0.13	0.46	0.32	0.23	0.31	0.39	0.85	0.46	0.47	0.18
Control Delay	14.0	26.3	4.7	16.9	21.5	4.4	27.0	44.6	34.1	29.0	41.8	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.0	26.3	4.7	16.9	21.5	4.4	27.0	44.6	34.1	29.0	41.8	6.3
LOS	B	C	A	B	C	A	C	D	C	C	D	A
Approach Delay		22.8			17.2			35.0				30.3
Approach LOS		C			B			D				C
Intersection Summary												
Area Type:	Other											
Cycle Length:	120											
Actuated Cycle Length:	120											
Offset:	43 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green											
Natural Cycle:	90											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.85											
Intersection Signal Delay:	25.1						Intersection LOS: C					
Intersection Capacity Utilization:	73.1%						ICU Level of Service D					
Analysis Period (min):	15											
Splits and Phases:	1: Kerr Street & Speers Road											

Timings
1: Kerr Street & Speers Road

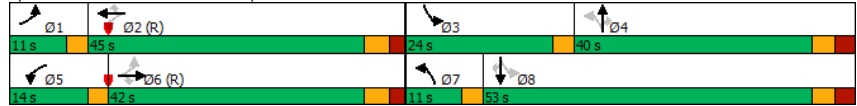
02/28/2024

	↖	→	↘	↙	←	↖	↙	↘	↙	↖	↘	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖	↖	↖	↖↖	↖	↖	↖	↖	↖↖	↖	↖
Traffic Volume (vph)	80	690	95	185	535	180	105	125	370	370	190	70
Future Volume (vph)	80	690	95	185	535	180	105	125	370	370	190	70
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Detector Phase	1	6	6	5	2	2	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	7.0	25.0	25.0	7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	10.0	30.9	30.9	10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3	34.3
Total Split (s)	11.0	42.0	42.0	14.0	45.0	45.0	11.0	40.0	40.0	24.0	53.0	53.0
Total Split (%)	9.2%	35.0%	35.0%	11.7%	37.5%	37.5%	9.2%	33.3%	33.3%	20.0%	44.2%	44.2%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	0.0	2.2	2.2	0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
Act Effect Green (s)	65.7	54.7	54.7	71.7	59.9	59.9	33.4	21.3	21.3	42.1	27.0	27.0
Actuated g/C Ratio	0.55	0.46	0.46	0.60	0.50	0.50	0.28	0.18	0.18	0.35	0.22	0.22
v/c Ratio	0.17	0.45	0.13	0.46	0.32	0.23	0.31	0.39	0.85	0.46	0.47	0.18
Control Delay	14.0	26.3	4.7	16.9	21.5	4.4	27.0	44.6	34.1	29.0	41.8	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.0	26.3	4.7	16.9	21.5	4.4	27.0	44.6	34.1	29.0	41.8	6.3
LOS	B	C	A	B	C	A	C	D	C	C	D	A
Approach Delay		22.8			17.2			35.0			30.3	
Approach LOS		C			B			D			C	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 43 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 25.1
 Intersection LOS: C
 Intersection Capacity Utilization 73.1%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 1: Kerr Street & Speers Road



Queues
1: Kerr Street & Speers Road

02/28/2024

	↖	→	↘	↙	←	↖	↙	↘	↙	↖	↘	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	84	726	100	195	563	189	111	132	389	389	200	74
v/c Ratio	0.17	0.45	0.13	0.46	0.32	0.23	0.31	0.39	0.85	0.46	0.47	0.18
Control Delay	14.0	26.3	4.7	16.9	21.5	4.4	27.0	44.6	34.1	29.0	41.8	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.0	26.3	4.7	16.9	21.5	4.4	27.0	44.6	34.1	29.0	41.8	6.3
Queue Length 50th (m)	7.8	59.7	0.0	19.3	40.8	0.0	18.1	27.9	35.8	34.4	41.9	0.0
Queue Length 95th (m)	19.7	100.2	10.1	41.7	71.1	15.4	24.8	40.2	64.8	37.1	52.4	8.8
Internal Link Dist (m)		211.8			123.2			103.4			143.2	
Turn Bay Length (m)	105.0			75.0		100.0	50.0		45.0	80.0		75.0
Base Capacity (vph)	512	1613	772	435	1766	835	366	535	590	931	739	633
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.45	0.13	0.45	0.32	0.23	0.30	0.25	0.66	0.42	0.27	0.12

Intersection Summary

HCM Signalized Intersection Capacity Analysis

1: Kerr Street & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	80	690	95	185	535	180	105	125	370	370	190	70
Future Volume (vph)	80	690	95	185	535	180	105	125	370	370	190	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.94	1.00	1.00	0.93	1.00	1.00	0.93
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	0.97	1.00	1.00	0.96	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	3539	1560	1751	3539	1485	1737	1900	1486	3332	1900	1501
Flt Permitted	0.43	1.00	1.00	0.28	1.00	1.00	0.63	1.00	1.00	0.55	1.00	1.00
Satd. Flow (perm)	806	3539	1560	516	3539	1485	1156	1900	1486	1921	1900	1501
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	84	726	100	195	563	189	111	132	389	389	200	74
RTOR Reduction (vph)	0	0	54	0	0	96	0	0	197	0	0	57
Lane Group Flow (vph)	84	726	46	195	563	93	111	132	192	389	200	17
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Actuated Green, G (s)	61.4	54.7	54.7	68.9	59.2	59.2	30.1	21.3	21.3	38.9	27.1	27.1
Effective Green, g (s)	61.4	54.7	54.7	68.9	59.2	59.2	30.1	21.3	21.3	38.9	27.1	27.1
Actuated g/C Ratio	0.51	0.46	0.46	0.57	0.49	0.49	0.25	0.18	0.18	0.32	0.23	0.23
Clearance Time (s)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Vehicle Extension (s)	2.5	5.5	5.5	2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	467	1613	711	411	1745	732	332	337	263	794	429	338
v/s Ratio Prot	0.01	0.21		c0.04	0.16		0.02	0.07		c0.06	0.11	
v/s Ratio Perm	0.08		0.03	c0.23		0.06	0.06		c0.13	0.10		0.01
v/c Ratio	0.18	0.45	0.06	0.47	0.32	0.13	0.33	0.39	0.73	0.49	0.47	0.05
Uniform Delay, d1	15.0	22.4	18.3	13.5	18.3	16.4	36.0	43.6	46.6	31.1	40.2	36.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.9	0.2	0.6	0.5	0.4	0.4	1.0	10.7	0.3	1.1	0.1
Delay (s)	15.2	23.3	18.5	14.1	18.8	16.8	36.4	44.7	57.3	31.5	41.3	36.4
Level of Service	B	C	B	B	B	B	D	D	E	C	D	D
Approach Delay (s)		22.0			17.4			51.0			35.0	
Approach LOS		C			B			D			C	

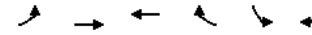
Intersection Summary		
HCM 2000 Control Delay	29.2	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.54	
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	73.1%	ICU Level of Service
Analysis Period (min)	15	

c Critical Lane Group

Lanes, Volumes, Timings

2: Speers Road & Cross Avenue

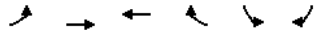
02/28/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	220	1260	640	20	5	245
Future Volume (vph)	220	1260	640	20	5	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	80.0			0.0	45.0	0.0
Storage Lanes	1			0	1	2
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	0.88
Ped Bike Factor	1.00		1.00			
Frt			0.995			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1703	3610	3554	0	1805	2733
Flt Permitted	0.358				0.950	
Satd. Flow (perm)	640	3610	3554	0	1805	2733
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			3			255
Link Speed (k/h)		60	60		48	
Link Distance (m)		233.1	101.5		84.0	
Travel Time (s)		14.0	6.1		6.3	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Adj. Flow (vph)	229	1313	667	21	5	255
Shared Lane Traffic (%)						
Lane Group Flow (vph)	229	1313	688	0	5	255
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
2: Speers Road & Cross Avenue

02/28/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Detector Phase	5	2	6		4	4
Switch Phase						
Minimum Initial (s)	6.0	38.0	38.0		10.0	10.0
Minimum Split (s)	12.0	47.6	47.6		15.8	15.8
Total Split (s)	35.0	109.0	74.0		31.0	31.0
Total Split (%)	25.0%	77.9%	52.9%		22.1%	22.1%
Maximum Green (s)	29.0	102.4	67.4		25.2	25.2
Yellow Time (s)	4.0	3.7	3.7		3.3	3.3
All-Red Time (s)	2.0	2.9	2.9		2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6		5.8	5.8
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Recall Mode	None	C-Min	C-Min		None	None
Walk Time (s)		10.0	10.0			
Flash Dont Walk (s)		31.0	31.0			
Pedestrian Calls (#/hr)		5	5			
Act Effect Green (s)	118.0	117.4	101.9		10.2	10.2
Actuated g/C Ratio	0.84	0.84	0.73		0.07	0.07
v/c Ratio	0.38	0.43	0.27		0.04	0.58
Control Delay	3.8	3.4	6.8		60.8	12.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	3.8	3.4	6.8		60.8	12.8
LOS	A	A	A		E	B
Approach Delay		3.5	6.8		13.7	
Approach LOS		A	A		B	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 99 (71%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 5.4 Intersection LOS: A
 Intersection Capacity Utilization 70.0% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: Speers Road & Cross Avenue



Timings
2: Speers Road & Cross Avenue

02/28/2024

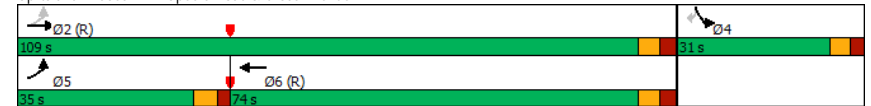


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↕↕	↕↕	↔	↕↕
Traffic Volume (vph)	220	1260	640	5	245
Future Volume (vph)	220	1260	640	5	245
Turn Type	pm+pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2				4
Detector Phase	5	2	6	4	4
Switch Phase					
Minimum Initial (s)	6.0	38.0	38.0	10.0	10.0
Minimum Split (s)	12.0	47.6	47.6	15.8	15.8
Total Split (s)	35.0	109.0	74.0	31.0	31.0
Total Split (%)	25.0%	77.9%	52.9%	22.1%	22.1%
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	None	None
Act Effect Green (s)	118.0	117.4	101.9	10.2	10.2
Actuated g/C Ratio	0.84	0.84	0.73	0.07	0.07
v/c Ratio	0.38	0.43	0.27	0.04	0.58
Control Delay	3.8	3.4	6.8	60.8	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.8	3.4	6.8	60.8	12.8
LOS	A	A	A	E	B
Approach Delay		3.5	6.8	13.7	
Approach LOS		A	A	B	

Intersection Summary

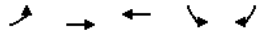
Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 99 (71%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 5.4 Intersection LOS: A
 Intersection Capacity Utilization 70.0% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: Speers Road & Cross Avenue



Queues
2: Speers Road & Cross Avenue

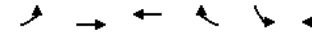
02/28/2024



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	229	1313	688	5	255
w/c Ratio	0.38	0.43	0.27	0.04	0.58
Control Delay	3.8	3.4	6.8	60.8	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.8	3.4	6.8	60.8	12.8
Queue Length 50th (m)	8.8	37.7	29.9	1.3	0.0
Queue Length 95th (m)	14.2	47.7	41.0	5.8	14.3
Internal Link Dist (m)		209.1	77.5	60.0	
Turn Bay Length (m)	80.0		45.0		
Base Capacity (vph)	759	3026	2588	324	701
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.30	0.43	0.27	0.02	0.36
Intersection Summary					

HCM Signalized Intersection Capacity Analysis
2: Speers Road & Cross Avenue

02/28/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕↕	↕↕		↔	↕↕
Traffic Volume (vph)	220	1260	640	20	5	245
Future Volume (vph)	220	1260	640	20	5	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.6	6.6		5.8	5.8
Lane Util. Factor	1.00	0.95	0.95		1.00	0.88
Frbp, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1701	3610	3556		1805	2733
Flt Permitted	0.36	1.00	1.00		0.95	1.00
Satd. Flow (perm)	640	3610	3556		1805	2733
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	229	1312	667	21	5	255
RTOR Reduction (vph)	0	0	1	0	0	236
Lane Group Flow (vph)	229	1313	687	0	5	19
Confl. Peds. (#/hr)	5			5		
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	117.4	117.4	102.0		10.2	10.2
Effective Green, g (s)	117.4	117.4	102.0		10.2	10.2
Actuated g/C Ratio	0.84	0.84	0.73		0.07	0.07
Clearance Time (s)	6.0	6.6	6.6		5.8	5.8
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Lane Grp Cap (vph)	607	3027	2590		131	199
v/s Ratio Prot	0.03	c0.36	0.19		0.00	
v/s Ratio Perm	0.29					c0.01
v/c Ratio	0.38	0.43	0.27		0.04	0.09
Uniform Delay, d1	2.5	2.9	6.4		60.3	60.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.5	0.5	0.3		0.1	0.2
Delay (s)	3.0	3.3	6.6		60.5	60.8
Level of Service	A	A	A		E	E
Approach Delay (s)		3.3	6.6		60.8	
Approach LOS		A	A		E	
Intersection Summary						
HCM 2000 Control Delay		10.2		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio		0.43				
Actuated Cycle Length (s)		140.0		Sum of lost time (s)		18.4
Intersection Capacity Utilization		70.0%		ICU Level of Service		C
Analysis Period (min)		15				
c Critical Lane Group						

Lanes, Volumes, Timings

3: St. Augustine Drive & Speers Road

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕			↕				↕		↕	
Traffic Volume (vph)	5	795	15	0	785	20	5	0	50	0	0	0
Future Volume (vph)	5	795	15	0	785	20	5	0	50	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		1	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.996				0.865			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1805	3562	0	0	3561	0	0	0	1644	0	1900	0
Flt Permitted	0.950							0.950				
Satd. Flow (perm)	1805	3562	0	0	3561	0	0	0	1644	0	1900	0
Link Speed (k/h)		60			60				40			30
Link Distance (m)		248.1			235.8				188.1			117.6
Travel Time (s)		14.9			14.1				16.9			14.1
Confl. Peds. (#/hr)	8		5	5		8	1		1	1		1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	5	828	16	0	818	21	5	0	52	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	844	0	0	839	0	0	5	52	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6				0.0			0.0
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		1.6			1.6				1.6			1.6
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free				Stop			Stop

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

3: St. Augustine Drive & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕			↕				↕		↕	
Traffic Volume (veh/h)	5	795	15	0	785	20	5	0	50	0	0	0
Future Volume (Veh/h)	5	795	15	0	785	20	5	0	50	0	0	0
Sign Control		Free			Free				Stop			Stop
Grade		0%			0%				0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	828	16	0	818	21	5	0	52	0	0	0
Pedestrians		1			1				5			8
Lane Width (m)		3.6			3.6				3.6			3.6
Walking Speed (m/s)		1.1			1.1				1.1			1.1
Percent Blockage		0			0				0			1
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)					236							
pX, platoon unblocked	0.91						0.91	0.91		0.91	0.91	0.91
vC, conflicting volume	847				849		1261	1698	428	1314	1696	428
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	635				849		1090	1570	428	1148	1567	175
tC, single (s)	4.1				4.1		7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2				2.2		3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99				100		97	100	91	100	100	100
cM capacity (veh/h)	866				794		154	100	578	127	100	762

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	5	552	292	545	294	57	0
Volume Left	5	0	0	0	0	5	0
Volume Right	0	0	16	0	21	52	0
cSH	866	1700	1700	1700	1700	465	1700
Volume to Capacity	0.01	0.32	0.17	0.32	0.17	0.12	0.00
Queue Length 95th (m)	0.1	0.0	0.0	0.0	0.0	3.2	0.0
Control Delay (s)	9.2	0.0	0.0	0.0	0.0	13.8	0.0
Lane LOS	A					B	A
Approach Delay (s)	0.1			0.0		13.8	0.0
Approach LOS						B	A

Intersection Summary	
Average Delay	0.5
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min)	15

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	55	10	35	75	5	165	55	275	60	95	530	20
Future Volume (vph)	55	10	35	75	5	165	55	275	60	95	530	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor				0.98		0.98			0.97		0.99	
Frt		0.884			0.854			0.850			0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1647	0	1752	1571	0	1770	3574	1583	1805	3574	1583
Flt Permitted	0.647			0.950			0.448			0.491		
Satd. Flow (perm)	1205	1647	0	1714	1571	0	835	3574	1537	928	3574	1583
Right Turn on Red			Yes			Yes		Yes			Yes	
Satd. Flow (RTOR)	38				170			105			65	
Link Speed (k/h)	48				50			50			50	
Link Distance (m)	84.8				265.3			167.2			94.4	
Travel Time (s)	6.4				19.1			12.0			6.8	
Confl. Peds. (#/hr)				13		6		4		4		
Peak Hour Factor	0.92	0.92	0.92	0.97	0.92	0.97	0.92	0.97	0.97	0.97	0.97	0.92
Heavy Vehicles (%)	2%	2%	2%	3%	2%	1%	2%	1%	2%	0%	1%	2%
Adj. Flow (vph)	60	11	38	77	5	170	60	284	62	98	546	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	49	0	77	175	0	60	284	62	98	546	22
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.6			3.6			3.6			3.6		
Link Offset(m)	0.0			0.0			0.0			0.0		
Crosswalk Width(m)	1.6			1.6			1.6			1.6		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

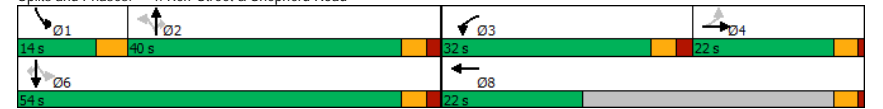
02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Prot	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8			2		2	1	6
Permitted Phases	4						2		2	6		6
Detector Phase	4	4		3	8		2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		10.0	5.0		18.0	18.0	18.0	7.0	18.0	18.0
Minimum Split (s)	22.0	22.0		31.4	22.0		28.2	28.2	28.2	11.0	28.2	28.2
Total Split (s)	22.0	22.0		32.0	22.0		40.0	40.0	40.0	14.0	54.0	54.0
Total Split (%)	20.4%	20.4%		29.6%	20.4%		37.0%	37.0%	37.0%	13.0%	50.0%	50.0%
Maximum Green (s)	18.0	18.0		26.6	18.0		34.8	34.8	34.8	10.0	48.8	48.8
Yellow Time (s)	3.0	3.0		3.3	3.0		3.3	3.3	3.3	4.0	3.3	3.3
All-Red Time (s)	1.0	1.0		2.1	1.0		1.9	1.9	1.9	0.0	1.9	1.9
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0		5.4	4.0		5.2	5.2	5.2	4.0	5.2	5.2
Lead/Lag	Lag	Lag		Lead			Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.5	3.5	3.5	2.5	3.5	3.5
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	Min
Walk Time (s)	7.0	7.0		10.0	7.0		10.0	10.0	10.0		10.0	10.0
Flash Dont Walk (s)	11.0	11.0		16.0	11.0		13.0	13.0	13.0		13.0	13.0
Pedestrian Calls (#/hr)	0	0		0	0		5	5	5		5	5
Act Effect Green (s)	9.1	9.1		11.8	20.2		25.0	25.0	25.0	32.4	33.3	33.3
Actuated g/C Ratio	0.16	0.16		0.20	0.35		0.43	0.43	0.43	0.56	0.58	0.58
v/c Ratio	0.32	0.17		0.22	0.26		0.17	0.18	0.09	0.15	0.26	0.02
Control Delay	30.8	13.5		27.2	4.1		20.1	17.6	1.8	10.0	10.4	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.8	13.5		27.2	4.1		20.1	17.6	1.8	10.0	10.4	0.1
LOS	C	B		C	A		C	B	A	A	B	A
Approach Delay		23.0			11.2			15.6			10.0	
Approach LOS		C			B			B			A	

Intersection Summary

Area Type:	Other
Cycle Length:	108
Actuated Cycle Length:	57.6
Natural Cycle:	95
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.32
Intersection Signal Delay:	12.8
Intersection Capacity Utilization:	61.3%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	B

Splits and Phases: 4: Kerr Street & Shepherd Road



Timings
4: Kerr Street & Shepherd Road

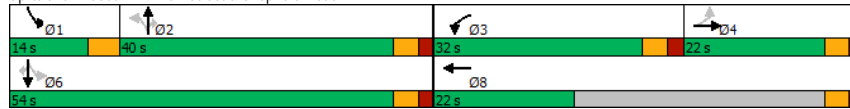
02/28/2024

	↖	→	↙	←	↘	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↙	↘	↖	↗	↘	↙	↘	↖
Traffic Volume (vph)	55	10	75	5	55	275	60	95	530	20
Future Volume (vph)	55	10	75	5	55	275	60	95	530	20
Turn Type	Perm	NA	Prot	NA	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4	3	8		2		1	6	
Permitted Phases	4				2		2	6		6
Detector Phase	4	4	3	8	2	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	10.0	5.0	18.0	18.0	18.0	7.0	18.0	18.0
Minimum Split (s)	22.0	22.0	31.4	22.0	28.2	28.2	28.2	11.0	28.2	28.2
Total Split (s)	22.0	22.0	32.0	22.0	40.0	40.0	40.0	14.0	54.0	54.0
Total Split (%)	20.4%	20.4%	29.6%	20.4%	37.0%	37.0%	37.0%	13.0%	50.0%	50.0%
Yellow Time (s)	3.0	3.0	3.3	3.0	3.3	3.3	3.3	4.0	3.3	3.3
All-Red Time (s)	1.0	1.0	2.1	1.0	1.9	1.9	1.9	0.0	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	5.4	4.0	5.2	5.2	5.2	4.0	5.2	5.2
Lead/Lag	Lag	Lag	Lead		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	Min	Min	Min	None	Min	Min
Act Effect Green (s)	9.1	9.1	11.8	20.2	25.0	25.0	25.0	32.4	33.3	33.3
Actuated g/C Ratio	0.16	0.16	0.20	0.35	0.43	0.43	0.43	0.56	0.58	0.58
v/c Ratio	0.32	0.17	0.22	0.26	0.17	0.18	0.09	0.15	0.26	0.02
Control Delay	30.8	13.5	27.2	4.1	20.1	17.6	1.8	10.0	10.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.8	13.5	27.2	4.1	20.1	17.6	1.8	10.0	10.4	0.1
LOS	C	B	C	A	C	B	A	A	B	A
Approach Delay		23.0		11.2		15.6			10.0	
Approach LOS		C		B		B			A	

Intersection Summary

Cycle Length: 108
 Actuated Cycle Length: 57.6
 Natural Cycle: 95
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.32
 Intersection Signal Delay: 12.8
 Intersection Capacity Utilization 61.3%
 Analysis Period (min) 15

Splits and Phases: 4: Kerr Street & Shepherd Road



Queues
4: Kerr Street & Shepherd Road

02/28/2024

	↖	→	↙	←	↘	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	60	49	77	175	60	284	62	98	546	22
v/c Ratio	0.32	0.17	0.22	0.26	0.17	0.18	0.09	0.15	0.26	0.02
Control Delay	30.8	13.5	27.2	4.1	20.1	17.6	1.8	10.0	10.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.8	13.5	27.2	4.1	20.1	17.6	1.8	10.0	10.4	0.1
Queue Length 50th (m)	6.4	1.1	7.8	0.4	5.2	13.1	0.0	5.7	19.3	0.0
Queue Length 95th (m)	17.9	9.8	21.2	11.1	15.4	24.8	3.2	14.2	33.5	0.2
Internal Link Dist (m)		60.8		241.3		143.2			70.4	
Turn Bay Length (m)	30.0		30.0		50.0		50.0		50.0	
Base Capacity (vph)	434	617	923	1311	524	2243	1004	697	2858	1279
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.08	0.08	0.13	0.11	0.13	0.06	0.14	0.19	0.02

Intersection Summary

HCM Signalized Intersection Capacity Analysis

4: Kerr Street & Shepherd Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	55	10	35	75	5	165	55	275	60	95	530	20
Future Volume (vph)	55	10	35	75	5	165	55	275	60	95	530	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		5.4	4.0		5.2	5.2	5.2	4.0	5.2	5.2
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frb, ped/bikes	1.00	1.00		1.00	0.98		1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.88		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1646		1752	1579		1770	3574	1543	1802	3574	1583
Flt Permitted	0.65	1.00		0.95	1.00		0.45	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)	1205	1646		1752	1579		835	3574	1543	932	3574	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.97	0.92	0.97	0.92	0.97	0.97	0.97	0.97	0.92
Adj. Flow (vph)	60	11	38	77	5	170	60	284	62	98	546	22
RTOR Reduction (vph)	0	34	0	0	116	0	0	0	39	0	0	10
Lane Group Flow (vph)	60	15	0	77	59	0	60	284	23	98	546	12
Confl. Peds. (#/hr)				13		6			4	4		
Heavy Vehicles (%)	2%	2%	2%	3%	2%	1%	2%	1%	2%	0%	1%	2%
Turn Type	Perm	NA		Prot	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4						2	2	6		6	
Actuated Green, G (s)	6.6	6.6		7.3	19.3		22.7	22.7	32.1	32.1	32.1	
Effective Green, g (s)	6.6	6.6		7.3	19.3		22.7	22.7	32.1	32.1	32.1	
Actuated g/C Ratio	0.11	0.11		0.12	0.32		0.37	0.37	0.37	0.53	0.53	0.53
Clearance Time (s)	4.0	4.0		5.4	4.0		5.2	5.2	5.2	4.0	5.2	5.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.5	3.5	3.5	2.5	3.5	3.5
Lane Grp Cap (vph)	131	179		211	502		312	1338	577	571	1893	838
v/s Ratio Prot		0.01		c0.04	0.04			0.08		0.02	c0.15	
v/s Ratio Perm	c0.05						0.07		0.02	0.08		0.01
v/c Ratio	0.46	0.08		0.36	0.12		0.19	0.21	0.04	0.17	0.29	0.01
Uniform Delay, d1	25.3	24.3		24.5	14.6		12.8	12.9	12.0	7.2	7.9	6.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.5	0.2		1.1	0.1		0.4	0.1	0.0	0.1	0.1	0.0
Delay (s)	27.9	24.5		25.6	14.7		13.1	13.0	12.1	7.3	8.0	6.8
Level of Service	C	C		C	B		B	B	B	A	A	A
Approach Delay (s)		26.3			18.0			12.9			7.9	
Approach LOS		C			B			B			A	

Intersection Summary		
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.36	
Actuated Cycle Length (s)	60.6	Sum of lost time (s)
Intersection Capacity Utilization	61.3%	ICU Level of Service
Analysis Period (min)	15	

c Critical Lane Group

Lanes, Volumes, Timings

5: Kerr Street & Wycroft Road

02/28/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	5	100	230	260	545	125
Future Volume (vph)	5	100	230	260	545	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	75.0	0.0	75.0			0.0
Storage Lanes	1	1	1			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850			0.972	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1553	1703	3610	3483	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1553	1703	3610	3483	0
Link Speed (k/h)	50		50	50		
Link Distance (m)	561.6		394.3	98.1		
Travel Time (s)	40.4		28.4	7.1		
Confl. Peds. (#/hr)			5			5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	4%	6%	0%	0%	4%
Adj. Flow (vph)	5	106	245	277	580	133
Shared Lane Traffic (%)						
Lane Group Flow (vph)	5	106	245	277	713	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6		3.6	3.6		
Link Offset(m)	0.0		0.0	0.0		
Crosswalk Width(m)	1.6		1.6	1.6		
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	45.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

5: Kerr Street & Wycroft Road

02/28/2024

Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Volume (veh/h)	5	100	230	260	545	125	
Future Volume (Veh/h)	5	100	230	260	545	125	
Sign Control	Stop		Free				
Grade	0%		0%				
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	
Hourly flow rate (vph)	5	106	245	277	580	133	
Pedestrians	5						
Lane Width (m)	3.6						
Walking Speed (m/s)	1.1						
Percent Blockage	0						
Right turn flare (veh)							
Median type			None		None		
Median storage (veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	1280	362	718				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1280	362	718				
tC, single (s)	6.8	7.0	4.2				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.3				
p0 queue free %	96	83	71				
cM capacity (veh/h)	113	627	849				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	5	106	245	138	138	387	326
Volume Left	5	0	245	0	0	0	0
Volume Right	0	106	0	0	0	0	133
cSH	113	627	849	1700	1700	1700	1700
Volume to Capacity	0.04	0.17	0.29	0.08	0.08	0.23	0.19
Queue Length 95th (m)	1.0	4.6	9.1	0.0	0.0	0.0	0.0
Control Delay (s)	38.2	11.9	11.0	0.0	0.0	0.0	0.0
Lane LOS	E	B	B				
Approach Delay (s)	13.1		5.1		0.0		
Approach LOS	B						
Intersection Summary							
Average Delay			3.1				
Intersection Capacity Utilization			45.2%		ICU Level of Service A		
Analysis Period (min)			15				

Lanes, Volumes, Timings

6: Kerr Street & Prince Charles Drive

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	5	5	0	75	5	520	5	40	425	5
Future Volume (vph)	5	0	5	5	0	75	5	520	5	40	425	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.932		0.873		0.999		0.999					
Fit Protected	0.976		0.997		0.996		0.996					
Satd. Flow (prot)	0	1728	0	0	1654	0	0	1876	0	0	1848	0
Fit Permitted	0.976		0.997		0.996		0.996					
Satd. Flow (perm)	0	1728	0	0	1654	0	0	1876	0	0	1848	0
Link Speed (k/h)	40		40		50		50					
Link Distance (m)	57.8		56.0		134.8		127.4					
Travel Time (s)	5.2		5.0		9.7		9.2					
Confl. Peds. (#/hr)	4		1	1		4	21		31	31		21
Confl. Bikes (#/hr)					1		1					
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	50%	0%	0%	0%	0%	20%	1%	0%	5%	2%	4%
Adj. Flow (vph)	5	0	5	5	0	79	5	547	5	42	447	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	10	0	0	84	0	0	557	0	0	494	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0		0.0		0.0		0.0		3.6			
Link Offset(m)	0.0		0.0		0.0		0.0		0.0			
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6			
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control	Stop		Stop		Free		Free					
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	62.1%				ICU Level of Service B							
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

6: Kerr Street & Prince Charles Drive

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	5	0	5	5	0	75	5	520	5	40	425	5
Future Volume (Veh/h)	5	0	5	5	0	75	5	520	5	40	425	5
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	0	5	5	0	79	5	547	5	42	447	5
Pedestrians	21			31			1			4		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	2			3			0			0		
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (m)							238			127		
pX, platoon unblocked	0.91	0.91	0.85	0.91	0.91	0.89	0.85				0.89	
vC, conflicting volume	1197	1148	472	1130	1148	584	473				583	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	893	838	295	819	838	471	297				469	
tC, single (s)	7.1	7.0	6.2	7.1	6.5	6.2	4.3				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.5	3.3	3.5	4.0	3.3	2.4				2.2	
p0 queue free %	97	100	99	98	100	85	99				95	
cM capacity (veh/h)	185	210	626	241	251	514	978				931	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	10	84	557	494								
Volume Left	5	5	5	42								
Volume Right	5	79	5	5								
cSH	285	482	978	931								
Volume to Capacity	0.04	0.17	0.01	0.05								
Queue Length 95th (m)	0.8	4.8	0.1	1.1								
Control Delay (s)	18.1	14.0	0.1	1.3								
Lane LOS	C	B	A	A								
Approach Delay (s)	18.1	14.0	0.1	1.3								
Approach LOS	C	B										
Intersection Summary												
Average Delay	1.8											
Intersection Capacity Utilization	62.1%			ICU Level of Service			B					
Analysis Period (min)	15											

Lanes, Volumes, Timings

7: Kerr Street & Elmwood Road

02/28/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	30	10	5	500	390	45
Future Volume (vph)	30	10	5	500	390	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.965				0.986	
Fit Protected	0.964					
Satd. Flow (prot)	1723	0	0	1860	1827	0
Fit Permitted	0.964					
Satd. Flow (perm)	1723	0	0	1860	1827	0
Link Speed (k/h)	40		50		50	
Link Distance (m)	171.2		103.0		134.8	
Travel Time (s)	15.4		7.4		9.7	
Confl. Peds. (#/hr)	1	2	34			34
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	10%	20%	2%	2%	7%
Adj. Flow (vph)	32	11	5	526	411	47
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	0	0	531	458	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24	14		
Sign Control	Stop			Free Free		
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	40.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

7: Kerr Street & Elmwood Road

02/28/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔		
Traffic Volume (veh/h)	30	10	5	500	390	45
Future Volume (Veh/h)	30	10	5	500	390	45
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	32	11	5	526	411	47
Pedestrians	34		2		1	
Lane Width (m)	3.6		3.6		3.6	
Walking Speed (m/s)	1.1		1.1		1.1	
Percent Blockage	3		0		0	
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)			103		262	
pX, platoon unblocked	0.91	0.91	0.91			
vC, conflicting volume	1006	470	492			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	733	366	390			
tC, single (s)	6.4	6.3	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.4			
p0 queue free %	91	98	99			
cM capacity (veh/h)	344	581	948			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	43	531	458			
Volume Left	32	5	0			
Volume Right	11	0	47			
cSH	384	948	1700			
Volume to Capacity	0.11	0.01	0.27			
Queue Length 95th (m)	2.8	0.1	0.0			
Control Delay (s)	15.5	0.1	0.0			
Lane LOS	C	A				
Approach Delay (s)	15.5	0.1	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			40.9%		ICU Level of Service A	
Analysis Period (min)	15					

Lanes, Volumes, Timings

8: Kerr Street & Stewart Street

02/28/2024



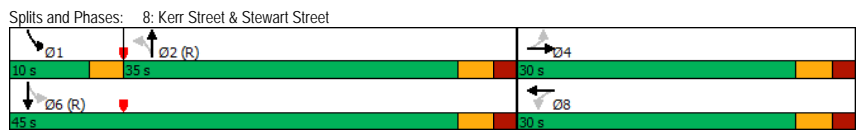
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Volume (vph)	35	25	5	20	35	70	5	400	20	40	330	30
Future Volume (vph)	35	25	5	20	35	70	5	400	20	40	330	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0		0.0		20.0		0.0		20.0	
Storage Lanes	0		0		0		1		0		1	
Taper Length (m)	2.5		2.5		2.5		2.5		2.5		2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98		0.97		0.97		0.97		1.00		0.98	
Frt	0.990		0.925		0.993		0.987		0.987		0.987	
Flt Protected	0.974		0.992		0.950		0.950		0.950		0.950	
Satd. Flow (prot)	0	1679	0	0	1616	0	1805	1849	0	1787	1830	0
Flt Permitted	0.796		0.941		0.530		0.413		0.413		0.413	
Satd. Flow (perm)	0	1353	0	0	1527	0	975	1849	0	765	1830	0
Right Turn on Red			Yes		Yes		Yes		Yes		Yes	
Satd. Flow (RTOR)	5		76		4		9		50		50	
Link Speed (k/h)	40		40		50		50		50		50	
Link Distance (m)	95.6		60.6		165.0		103.0		103.0		103.0	
Travel Time (s)	8.6		5.5		11.9		7.4		7.4		7.4	
Confl. Peds. (#/hr)	20		15	15		20	35		25	25		35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	17%	1%	17%	2%	0%
Adj. Flow (vph)	38	27	5	22	38	76	5	435	22	43	359	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	70	0	0	136	0	5	457	0	43	392	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0		0.0		3.6		0.0		3.6		0.0	
Link Offset(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6		1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)	9.4		9.4		9.4		9.4		9.4		9.4	
Detector 2 Size(m)	0.6		0.6		0.6		0.6		0.6		0.6	
Detector 2 Type	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0		0.0		0.0		0.0		0.0		0.0	

Lanes, Volumes, Timings
8: Kerr Street & Stewart Street

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	NA	pm+pt	NA	NA
Protected Phases		4			8			2			1	6
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		24.0	24.0		6.0	24.0	
Minimum Split (s)	30.0	30.0		30.0	30.0		32.0	32.0		10.0	32.0	
Total Split (s)	30.0	30.0		30.0	30.0		35.0	35.0		10.0	45.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		46.7%	46.7%		13.3%	60.0%	
Maximum Green (s)	24.6	24.6		24.6	24.6		29.6	29.6		7.0	39.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.0	3.3	
All-Red Time (s)	2.1	2.1		2.1	2.1		2.1	2.1		0.0	2.1	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.4			5.4		5.4	5.4		3.0	5.4	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
Recall Mode	None	None		None	None		C-Min	C-Min		None	C-Min	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0		
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		14.0	14.0		14.0		
Pedestrian Calls (#/hr)	20	20		20	20		35	35		35		
Act Effect Green (s)		15.2			15.2		47.4	47.4		54.5	53.2	
Actuated g/C Ratio		0.20			0.20		0.63	0.63		0.73	0.71	
v/c Ratio		0.25			0.37		0.01	0.39		0.07	0.30	
Control Delay		23.5			14.0		12.4	12.8		5.8	7.3	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		23.5			14.0		12.4	12.8		5.8	7.3	
LOS		C			B		B	B		A	A	
Approach Delay		23.5			14.0			12.8			7.2	
Approach LOS		C			B			B			A	

Intersection Summary	
Area Type:	Other
Cycle Length:	75
Actuated Cycle Length:	75
Offset:	13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	75
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.39
Intersection Signal Delay:	11.4
Intersection Capacity Utilization:	55.9%
ICU Level of Service:	B
Analysis Period (min):	15

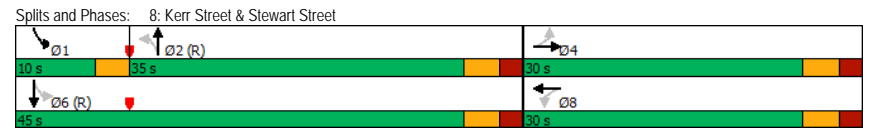


Timings
8: Kerr Street & Stewart Street

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔		↔	↔	↔
Traffic Volume (vph)	35	25		20	35		5	400		40	330	
Future Volume (vph)	35	25		20	35		5	400		40	330	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		24.0	24.0		6.0	24.0	
Minimum Split (s)	30.0	30.0		30.0	30.0		32.0	32.0		10.0	32.0	
Total Split (s)	30.0	30.0		30.0	30.0		35.0	35.0		10.0	45.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		46.7%	46.7%		13.3%	60.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.0	3.3	
All-Red Time (s)	2.1	2.1		2.1	2.1		2.1	2.1		0.0	2.1	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.4			5.4		5.4	5.4		3.0	5.4	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Recall Mode	None	None		None	None		C-Min	C-Min		None	C-Min	
Act Effect Green (s)		15.2			15.2		47.4	47.4		54.5	53.2	
Actuated g/C Ratio		0.20			0.20		0.63	0.63		0.73	0.71	
v/c Ratio		0.25			0.37		0.01	0.39		0.07	0.30	
Control Delay		23.5			14.0		12.4	12.8		5.8	7.3	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		23.5			14.0		12.4	12.8		5.8	7.3	
LOS		C			B		B	B		A	A	
Approach Delay		23.5			14.0			12.8			7.2	
Approach LOS		C			B			B			A	

Intersection Summary	
Cycle Length:	75
Actuated Cycle Length:	75
Offset:	13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	75
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.39
Intersection Signal Delay:	11.4
Intersection Capacity Utilization:	55.9%
ICU Level of Service:	B
Analysis Period (min):	15



Queues

8: Kerr Street & Stewart Street

02/28/2024



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	70	136	5	457	43	392
w/c Ratio	0.25	0.37	0.01	0.39	0.07	0.30
Control Delay	23.5	14.0	12.4	12.8	5.8	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.5	14.0	12.4	12.8	5.8	7.3
Queue Length 50th (m)	8.5	7.8	0.3	30.2	1.2	15.2
Queue Length 95th (m)	15.7	18.1	2.2	76.6	6.0	46.0
Internal Link Dist (m)	71.6	36.6	141.0		79.0	
Turn Bay Length (m)			20.0		20.0	
Base Capacity (vph)	447	551	615	1169	651	1299
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced w/c Ratio	0.16	0.25	0.01	0.39	0.07	0.30

Intersection Summary

HCM Signalized Intersection Capacity Analysis

8: Kerr Street & Stewart Street

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (vph)	35	25	5	20	35	70	5	400	20	40	330	30
Future Volume (vph)	35	25	5	20	35	70	5	400	20	40	330	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.4			5.4		5.4	5.4		3.0	5.4	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.97		1.00	1.00	1.00	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.99	1.00		1.00	0.97	1.00	0.99	1.00		0.99	1.00	
Frt	0.99	0.92		0.92	1.00	0.99	1.00	0.99		1.00	0.99	
Flt Protected	0.97			0.99	0.95	1.00				0.95	1.00	
Satd. Flow (prot)	1656			1609	1748	1848				1775	1831	
Flt Permitted	0.80			0.94	0.53	1.00				0.41	1.00	
Satd. Flow (perm)	1354			1526	976	1848				772	1831	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	27	5	22	38	76	5	435	22	43	359	33
RTOR Reduction (vph)	0	4	0	0	63	0	0	2	0	0	3	0
Lane Group Flow (vph)	0	66	0	0	73	0	5	455	0	43	389	0
Confl. Peds. (#/hr)	20		15	15		20	35		25	25		35
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.2			13.2		44.0	44.0		51.0	51.0	
Effective Green, g (s)		13.2			13.2		44.0	44.0		51.0	51.0	
Actuated g/C Ratio		0.18			0.18		0.59	0.59		0.68	0.68	
Clearance Time (s)		5.4			5.4		5.4	5.4		3.0	5.4	
Vehicle Extension (s)		4.0			4.0		4.0	4.0		3.0	4.0	
Lane Grp Cap (vph)		238			268		572	1084		578	1245	
v/s Ratio Prot							c0.25			0.00	c0.21	
v/s Ratio Perm		c0.05			0.05		0.01			0.05		
v/c Ratio		0.28			0.27		0.01	0.42		0.07	0.31	
Uniform Delay, d1		26.8			26.8		6.4	8.5		4.4	4.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.9			0.8		0.0	1.2		0.1	0.7	
Delay (s)		27.6			27.5		6.5	9.7		4.5	5.5	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		27.6			27.5		9.7			5.4		
Approach LOS		C			C		A			A		

Intersection Summary

HCM 2000 Control Delay	11.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	13.8
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

9: Speers Internal Road 1 & Speers Road

02/28/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (vph)	1415	15	0	900	0	20
Future Volume (vph)	1415	15	0	900	0	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.998		0.865			
Flt Protected						
Satd. Flow (prot)	3603	0	0	3610	0	1644
Flt Permitted						
Satd. Flow (perm)	3603	0	0	3610	0	1644
Link Speed (k/h)	60		60		20	
Link Distance (m)	147.2		113.4		44.5	
Travel Time (s)	8.8		6.8		8.0	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1444	15	0	918	0	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1459	0	0	918	0	20
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6		3.6		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	14		24		24	
Sign Control	Free		Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	49.6%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

9: Speers Internal Road 1 & Speers Road

02/28/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (veh/h)	1415	15	0	900	0	20
Future Volume (Veh/h)	1415	15	0	900	0	20
Sign Control	Free			Stop		
Grade	0%			0%		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	1444	15	0	918	0	20
Pedestrians	1			1		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	147			347		
pX, platoon unblocked				0.77	0.79	0.77
vC, conflicting volume				1459	1912	730
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				1003	1395	60
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				100	100	97
cM capacity (veh/h)				539	107	771

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	963	496	459	459	20
Volume Left	0	0	0	0	0
Volume Right	0	15	0	0	20
cSH	1700	1700	1700	1700	771
Volume to Capacity	0.57	0.29	0.27	0.27	0.03
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.6
Control Delay (s)	0.0	0.0	0.0	0.0	9.8
Lane LOS	A				
Approach Delay (s)	0.0		0.0		9.8
Approach LOS	A				

Intersection Summary

Average Delay	0.1				
Intersection Capacity Utilization	49.6%		ICU Level of Service		A
Analysis Period (min)	15				

Lanes, Volumes, Timings

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/28/2024

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	20	0	0	15	0
Future Volume (vph)	0	20	0	0	15	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected						0.950
Satd. Flow (prot)	1644	0	1900	0	0	1805
Flt Permitted						0.950
Satd. Flow (perm)	1644	0	1900	0	0	1805
Link Speed (k/h)	20		20		20	
Link Distance (m)	67.5		49.5		44.5	
Travel Time (s)	12.2		8.9		8.0	
Confl. Peds. (#/hr)	8					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	25	0	0	19	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	25	0	0	0	0	19
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	14		24	
Sign Control	Stop		Free		Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	15.7% ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/28/2024

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	20	0	0	15	0
Future Volume (Veh/h)	0	20	0	0	15	0
Sign Control	Stop		Free		Free	
Grade	0%					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	25	0	0	19	0
Pedestrians	2					
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0					1
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	40	8	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	40	8	0			
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			99	
cM capacity (veh/h)	964	1072			1636	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	25	0	19
Volume Left	0	0	19
Volume Right	25	0	0
cSH	1072	1700	1636
Volume to Capacity	0.02	0.00	0.01
Queue Length 95th (m)	0.5	0.0	0.3
Control Delay (s)	8.4	0.0	7.2
Lane LOS	A		A
Approach Delay (s)	8.4	0.0	7.2
Approach LOS	A		

Intersection Summary			
Average Delay	7.9		
Intersection Capacity Utilization	15.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings

12: Underground & Speers Internal Road

02/28/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (vph)	10	10	10	0	20	30
Future Volume (vph)	10	10	10	0	20	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.932					0.919
Flt Protected				0.950	0.981	
Satd. Flow (prot)	1771	0	0	1805	1713	0
Flt Permitted				0.950	0.981	
Satd. Flow (perm)	1771	0	0	1805	1713	0
Link Speed (k/h)	20					
Link Distance (m)	67.5		44.6		38.9	
Travel Time (s)	12.2		8.0		7.0	
Confl. Peds. (#/hr)	10					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%					
Adj. Flow (vph)	13	13	13	0	25	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	26	0	0	13	63	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0		0.0		3.6	
Link Offset(m)	0.0					
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	14		24		24	
Sign Control	Free			Free Stop		

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	17.2%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

12: Underground & Speers Internal Road

02/28/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (veh/h)	10	10	10	0	20	30
Future Volume (Veh/h)	10	10	10	0	20	30
Sign Control	Free			Free Stop		
Grade	0%					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	13	13	13	0	25	38
Pedestrians	10					
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	1					
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume				26	56	22
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				26	56	22
tC, single (s)				4.1	6.4	6.2
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				99	97	96
cM capacity (veh/h)				1601	941	1057

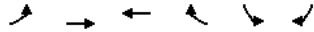
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	26	13	63
Volume Left	0	13	25
Volume Right	13	0	38
cSH	1700	1601	1008
Volume to Capacity	0.02	0.01	0.06
Queue Length 95th (m)	0.0	0.2	1.5
Control Delay (s)	0.0	7.3	8.8
Lane LOS	A		
Approach Delay (s)	0.0	7.3	8.8
Approach LOS	A		

Intersection Summary	
Average Delay	6.4
Intersection Capacity Utilization	17.2%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings

13: Speers Internal Road/30 Speers & Speers Internal Road 2

02/28/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↓	
Traffic Volume (vph)	40	0	0	20	5	10
Future Volume (vph)	40	0	0	20	5	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.865		0.910	
Flt Protected		0.950			0.984	
Satd. Flow (prot)	0	1504	1644	0	1575	0
Flt Permitted		0.950			0.984	
Satd. Flow (perm)	0	1504	1644	0	1575	0
Link Speed (k/h)		20	20		20	
Link Distance (m)		44.6	43.4		49.2	
Travel Time (s)		8.0	7.8		8.9	
Confl. Peds. (#/hr)	2			2	7	
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63
Heavy Vehicles (%)	20%	0%	0%	0%	0%	12%
Adj. Flow (vph)	63	0	0	32	8	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	63	32	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		24		14	24	14
Sign Control		Stop	Stop		Free	

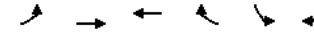
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.9%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

13: Speers Internal Road/30 Speers & Speers Internal Road 2

02/28/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↓	
Traffic Volume (veh/h)	40	0	0	20	5	10
Future Volume (Veh/h)	40	0	0	20	5	10
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63
Hourly flow rate (vph)	63	0	0	32	8	16
Pedestrians		3	7		2	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.1	1.1		1.1	
Percent Blockage		0	1		0	
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	61	34	42	9	7	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	61	34	42	9	7	
tC, single (s)	7.3	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.7	4.0	4.0	3.3	2.2	
p0 queue free %	93	100	100	97	100	
cM capacity (veh/h)	852	850	842	1070	1616	

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	63	32	24
Volume Left	63	0	8
Volume Right	0	32	16
cSH	852	1070	1616
Volume to Capacity	0.07	0.03	0.00
Queue Length 95th (m)	1.8	0.7	0.1
Control Delay (s)	9.6	8.5	2.4
Lane LOS	A	A	A
Approach Delay (s)	9.6	8.5	2.4
Approach LOS	A	A	

Intersection Summary

Average Delay		7.8	
Intersection Capacity Utilization	18.9%		ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR				
Lane Configurations		↑↑			↑↑			↑↑			↑↑					
Traffic Volume (vph)	0	1435	0	15	875	0	25	0	40	0	0	0				
Future Volume (vph)	0	1435	0	15	875	0	25	0	40	0	0	0				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900				
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Ped Bike Factor																
Frt	0.917															
Flt Protected	0.999															
Satd. Flow (prot)	0	3539	0	0	3537	0	0	1709	0	0	1863	0				
Flt Permitted	0.999															
Satd. Flow (perm)	0	3539	0	0	3537	0	0	1709	0	0	1863	0				
Link Speed (k/h)	60															
Link Distance (m)	113.4				233.1				49.2				39.0			
Travel Time (s)	6.8				14.0				8.9				7.0			
Confl. Peds. (#/hr)	8			8												
Confl. Bikes (#/hr)	1															
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92				
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	2%	0%	2%	2%	2%				
Adj. Flow (vph)	0	1511	0	16	921	0	26	0	42	0	0	0				
Shared Lane Traffic (%)																
Lane Group Flow (vph)	0	1511	0	0	937	0	0	68	0	0	0	0				
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No				
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right				
Median Width(m)	3.6				3.6				0.0							
Link Offset(m)	0.0				0.0				0.0							
Crosswalk Width(m)	1.6				1.6				1.6							
Two way Left Turn Lane																
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Turning Speed (k/h)	24		14		24		14		24		14					
Sign Control	Free			Free			Stop			Stop						

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	50.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (veh/h)	0	1435	0	15	875	0	25	0	40	0	0	0
Future Volume (Veh/h)	0	1435	0	15	875	0	25	0	40	0	0	0
Sign Control	Free			Free			Stop			Stop		
Grade	0%											
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Hourly flow rate (vph)	0	1511	0	16	921	0	26	0	42	0	0	0
Pedestrians	4											
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	0			0			1			1		
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)	261			233								
pX, platoon unblocked	0.94			0.78			0.81			0.81		
vC, conflicting volume	921			1519			2016			2472		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	795			1112			1473			2035		
tC, single (s)	4.1			4.1			7.5			6.5		
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5			4.0		
p0 queue free %	100			97			63			100		
cM capacity (veh/h)	775			495			70			44		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1007	504	323	614	68	0
Volume Left	0	0	16	0	26	0
Volume Right	0	0	0	0	42	0
cSH	1700	1700	495	1700	157	1700
Volume to Capacity	0.59	0.30	0.03	0.36	0.43	0.00
Queue Length 95th (m)	0.0	0.0	0.8	0.0	14.8	0.0
Control Delay (s)	0.0	0.0	1.1	0.0	44.4	0.0
Lane LOS	A		E		A	
Approach Delay (s)	0.0		0.4		44.4	
Approach LOS	E		A		A	

Intersection Summary

Average Delay	1.3
Intersection Capacity Utilization	50.2%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

02/28/2024

	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖	↖	↖	↖↖	↖	↖	↖	↖	↖↖	↖	↖
Traffic Volume (vph)	160	600	140	300	880	505	150	175	235	305	295	40
Future Volume (vph)	160	600	140	300	880	505	150	175	235	305	295	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	105.0		0.0	75.0		100.0	50.0		45.0	80.0		75.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Ped Bike Factor	0.99		0.97	1.00		0.94	0.97		0.93	0.94		0.93
Frt		0.850				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3539	1615	1752	3539	1583	1787	1900	1599	3467	1900	1615
Flt Permitted	0.230			0.321			0.306			0.459		
Satd. Flow (perm)	434	3539	1560	589	3539	1485	557	1900	1486	1566	1900	1501
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			147			467			247			81
Link Speed (k/h)		60			60			50				50
Link Distance (m)		235.8			147.2			127.4				167.2
Travel Time (s)		14.1			8.8			9.2				12.0
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Adj. Flow (vph)	168	632	147	316	926	532	158	184	247	321	311	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	168	632	147	316	926	532	158	184	247	321	311	42
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			7.2				7.2
Link Offset(m)		0.0			0.0			0.0				0.0
Crosswalk Width(m)		1.6			1.6			1.6				1.6
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4				9.4
Detector 2 Size(m)		0.6			0.6			0.6				0.6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

02/28/2024

	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Detector Phase	1	6	6	5	2	2	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	7.0	25.0	25.0	7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	10.0	30.9	30.9	10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3	34.3
Total Split (s)	12.0	54.0	54.0	12.0	54.0	54.0	12.0	38.0	38.0	16.0	42.0	42.0
Total Split (%)	10.0%	45.0%	45.0%	10.0%	45.0%	45.0%	10.0%	31.7%	31.7%	13.3%	35.0%	35.0%
Maximum Green (s)	9.0	48.1	48.1	9.0	48.1	48.1	9.0	31.7	31.7	13.0	35.7	35.7
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	0.0	2.2	2.2	0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.5	5.5	5.5	2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	4.0
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		14.0	14.0		14.0	14.0		14.0	14.0		14.0	14.0
Pedestrian Calls (#/hr)		15	15		15	15		35	35		35	35
Act Effect Green (s)	65.2	52.7	52.7	71.8	56.9	56.9	36.0	23.2	23.2	40.7	25.8	25.8
Actuated g/C Ratio	0.54	0.44	0.44	0.60	0.47	0.47	0.30	0.19	0.19	0.34	0.22	0.22
v/c Ratio	0.49	0.41	0.19	0.65	0.55	0.56	0.60	0.50	0.51	0.44	0.76	0.11
Control Delay	16.8	25.0	4.3	21.1	25.3	6.3	37.7	47.4	8.5	29.5	56.3	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.8	25.0	4.3	21.1	25.3	6.3	37.7	47.4	8.5	29.5	56.3	1.6
LOS	B	C	A	C	C	A	D	D	A	C	E	A
Approach Delay		20.3			18.9			28.5				40.1
Approach LOS		C			B			C				D
Intersection Summary												
Area Type:	Other											
Cycle Length:	120											
Actuated Cycle Length:	120											
Offset:	49 (41%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green											
Natural Cycle:	90											
Control Type:	Actuated-Coordinated											
Maximum v/c Ratio:	0.76											
Intersection Signal Delay:	24.2						Intersection LOS: C					
Intersection Capacity Utilization:	79.5%						ICU Level of Service D					
Analysis Period (min):	15											
Splits and Phases:	1: Kerr Street & Speers Road											

Timings
1: Kerr Street & Speers Road

02/28/2024

	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖	↖	↖	↖↖	↖	↖	↖	↖	↖↖	↖	↖
Traffic Volume (vph)	160	600	140	300	880	505	150	175	235	305	295	40
Future Volume (vph)	160	600	140	300	880	505	150	175	235	305	295	40
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Detector Phase	1	6	6	5	2	2	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	7.0	25.0	25.0	7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	10.0	30.9	30.9	10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3	34.3
Total Split (s)	12.0	54.0	54.0	12.0	54.0	54.0	12.0	38.0	38.0	16.0	42.0	42.0
Total Split (%)	10.0%	45.0%	45.0%	10.0%	45.0%	45.0%	10.0%	31.7%	31.7%	13.3%	35.0%	35.0%
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	3.3
All-Red Time (s)	0.0	2.2	2.2	0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None	None	None
Act Effect Green (s)	65.2	52.7	52.7	71.8	56.9	56.9	36.0	23.2	23.2	40.7	25.8	25.8
Actuated g/C Ratio	0.54	0.44	0.44	0.60	0.47	0.47	0.30	0.19	0.19	0.34	0.22	0.22
v/c Ratio	0.49	0.41	0.19	0.65	0.55	0.56	0.60	0.50	0.51	0.44	0.76	0.11
Control Delay	16.8	25.0	4.3	21.1	25.3	6.3	37.7	47.4	8.5	29.5	56.3	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.8	25.0	4.3	21.1	25.3	6.3	37.7	47.4	8.5	29.5	56.3	1.6
LOS	B	C	A	C	C	A	D	D	A	C	E	A
Approach Delay		20.3			18.9			28.5			40.1	
Approach LOS		C			B			C			D	

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 49 (41%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.76
 Intersection Signal Delay: 24.2 Intersection LOS: C
 Intersection Capacity Utilization 79.5% ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 1: Kerr Street & Speers Road



Queues
1: Kerr Street & Speers Road

02/28/2024

	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	168	632	147	316	926	532	158	184	247	321	311	42
v/c Ratio	0.49	0.41	0.19	0.65	0.55	0.56	0.60	0.50	0.51	0.44	0.76	0.11
Control Delay	16.8	25.0	4.3	21.1	25.3	6.3	37.7	47.4	8.5	29.5	56.3	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.8	25.0	4.3	21.1	25.3	6.3	37.7	47.4	8.5	29.5	56.3	1.6
Queue Length 50th (m)	16.3	54.9	0.0	33.9	80.0	8.3	26.4	39.5	0.0	27.8	69.3	0.0
Queue Length 95th (m)	30.7	72.4	12.2	#61.5	113.8	39.6	39.0	57.5	20.1	35.3	92.7	1.6
Internal Link Dist (m)		211.8			123.2		103.4				143.2	
Turn Bay Length (m)	105.0			75.0		100.0	50.0		45.0	80.0		75.0
Base Capacity (vph)	353	1554	767	486	1676	949	265	501	574	745	565	503
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.41	0.19	0.65	0.55	0.56	0.60	0.37	0.43	0.43	0.55	0.08

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Kerr Street & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔	↔↔	↔	↔	↔	↔	↔↔	↔	↔
Traffic Volume (vph)	160	600	140	300	880	505	150	175	235	305	295	40
Future Volume (vph)	160	600	140	300	880	505	150	175	235	305	295	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.94	1.00	1.00	0.93	1.00	1.00	0.93
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1802	3539	1560	1750	3539	1485	1773	1900	1486	3371	1900	1501
Flt Permitted	0.23	1.00	1.00	0.32	1.00	1.00	0.31	1.00	1.00	0.46	1.00	1.00
Satd. Flow (perm)	437	3539	1560	591	3539	1485	571	1900	1486	1630	1900	1501
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	168	632	147	316	926	532	158	184	247	321	311	42
RTOR Reduction (vph)	0	0	82	0	0	246	0	0	199	0	0	33
Lane Group Flow (vph)	168	632	65	316	926	286	158	184	48	321	311	9
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4		4	8		8
Actuated Green, G (s)	62.3	52.7	52.7	69.5	56.9	56.9	32.7	23.2	23.2	37.9	25.8	25.8
Effective Green, g (s)	62.3	52.7	52.7	69.5	56.9	56.9	32.7	23.2	23.2	37.9	25.8	25.8
Actuated g/C Ratio	0.52	0.44	0.44	0.58	0.47	0.47	0.27	0.19	0.19	0.32	0.22	0.22
Clearance Time (s)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Vehicle Extension (s)	2.5	5.5	5.5	2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	336	1554	685	475	1678	704	250	367	287	690	408	322
v/s Ratio Prot	0.04	0.18		c0.08	0.26		c0.05	0.10		c0.05	c0.16	
v/s Ratio Perm	0.22		0.04	c0.31		0.19	0.12		0.03	0.10		0.01
v/c Ratio	0.50	0.41	0.09	0.67	0.55	0.41	0.63	0.50	0.17	0.47	0.76	0.03
Uniform Delay, d1	16.3	23.0	19.7	14.1	22.5	20.6	35.4	43.2	40.3	31.3	44.2	37.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.8	0.3	3.2	1.3	1.7	4.5	1.5	0.4	0.4	8.7	0.0
Delay (s)	17.2	23.8	20.0	17.2	23.8	22.3	39.9	44.7	40.7	31.7	52.9	37.2
Level of Service	B	C	B	B	C	C	D	D	D	C	D	D
Approach Delay (s)		22.0			22.2			41.8			41.8	
Approach LOS		C			C			D			D	

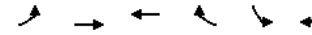
Intersection Summary		
HCM 2000 Control Delay	28.3	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.71	
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	79.5%	ICU Level of Service
Analysis Period (min)	15	

c Critical Lane Group

Lanes, Volumes, Timings

2: Speers Road & Cross Avenue

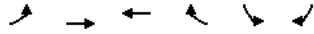
02/28/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔↔	↔↔		↔	↔↔
Traffic Volume (vph)	270	850	1260	15	10	420
Future Volume (vph)	270	850	1260	15	10	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	80.0			0.0	45.0	0.0
Storage Lanes	1			0	1	2
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	0.88
Ped Bike Factor	1.00		1.00			
Frt			0.998			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1703	3610	3566	0	1805	2733
Flt Permitted	0.124				0.950	
Satd. Flow (perm)	222	3610	3566	0	1805	2733
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			1			307
Link Speed (k/h)		60	60		48	
Link Distance (m)		233.1	101.5		84.0	
Travel Time (s)		14.0	6.1		6.3	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Adj. Flow (vph)	281	885	1313	16	10	438
Shared Lane Traffic (%)						
Lane Group Flow (vph)	281	885	1329	0	10	438
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
2: Speers Road & Cross Avenue

02/28/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Detector Phase	5	2	6		4	4
Switch Phase						
Minimum Initial (s)	6.0	38.0	38.0		10.0	10.0
Minimum Split (s)	12.0	47.6	47.6		15.8	15.8
Total Split (s)	17.0	102.0	85.0		38.0	38.0
Total Split (%)	12.1%	72.9%	60.7%		27.1%	27.1%
Maximum Green (s)	11.0	95.4	78.4		32.2	32.2
Yellow Time (s)	4.0	3.7	3.7		3.3	3.3
All-Red Time (s)	2.0	2.9	2.9		2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6		5.8	5.8
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Recall Mode	None	C-Min	C-Min		None	None
Walk Time (s)		10.0	10.0			
Flash Dont Walk (s)		31.0	31.0			
Pedestrian Calls (#/hr)		5	5			
Act Effect Green (s)	114.1	113.5	83.4		14.1	14.1
Actuated g/C Ratio	0.82	0.81	0.60		0.10	0.10
v/c Ratio	0.64	0.30	0.63		0.06	0.80
Control Delay	23.3	3.9	20.3		54.5	29.1
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	23.3	3.9	20.3		54.5	29.1
LOS	C	A	C		D	C
Approach Delay		8.6	20.3		29.7	
Approach LOS		A	C		C	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 13 (9%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 17.1 Intersection LOS: B
 Intersection Capacity Utilization 73.9% ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 2: Speers Road & Cross Avenue



Timings
2: Speers Road & Cross Avenue

02/28/2024

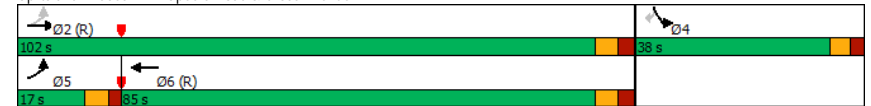


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↕↕	↕↕	↔	↕↕
Traffic Volume (vph)	270	850	1260	10	420
Future Volume (vph)	270	850	1260	10	420
Turn Type	pm+pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2				4
Detector Phase	5	2	6	4	4
Switch Phase					
Minimum Initial (s)	6.0	38.0	38.0	10.0	10.0
Minimum Split (s)	12.0	47.6	47.6	15.8	15.8
Total Split (s)	17.0	102.0	85.0	38.0	38.0
Total Split (%)	12.1%	72.9%	60.7%	27.1%	27.1%
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	None	None
Act Effect Green (s)	114.1	113.5	83.4	14.1	14.1
Actuated g/C Ratio	0.82	0.81	0.60	0.10	0.10
v/c Ratio	0.64	0.30	0.63	0.06	0.80
Control Delay	23.3	3.9	20.3	54.5	29.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	3.9	20.3	54.5	29.1
LOS	C	A	C	D	C
Approach Delay		8.6	20.3	29.7	
Approach LOS		A	C	C	

Intersection Summary

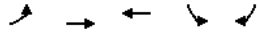
Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 13 (9%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 17.1 Intersection LOS: B
 Intersection Capacity Utilization 73.9% ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 2: Speers Road & Cross Avenue



Queues
2: Speers Road & Cross Avenue

02/28/2024

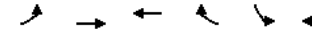


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	281	885	1329	10	438
w/c Ratio	0.64	0.30	0.63	0.06	0.80
Control Delay	23.3	3.9	20.3	54.5	29.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	3.9	20.3	54.5	29.1
Queue Length 50th (m)	27.2	25.4	113.7	2.6	20.0
Queue Length 95th (m)	63.3	43.2	157.3	7.8	38.8
Internal Link Dist (m)		209.1	77.5	60.0	
Turn Bay Length (m)	80.0		45.0		
Base Capacity (vph)	436	2927	2129	415	864
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.64	0.30	0.62	0.02	0.51

Intersection Summary

HCM Signalized Intersection Capacity Analysis
2: Speers Road & Cross Avenue

02/28/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕↕	↕↕		↔	↕↕
Traffic Volume (vph)	270	850	1260	15	10	420
Future Volume (vph)	270	850	1260	15	10	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.6	6.6		5.8	5.8
Lane Util. Factor	1.00	0.95	0.95		1.00	0.88
Frbp, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1703	3610	3567		1805	2733
Flt Permitted	0.12	1.00	1.00		0.95	1.00
Satd. Flow (perm)	223	3610	3567		1805	2733
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	281	885	1312	16	10	438
RTOR Reduction (vph)	0	0	0	0	0	276
Lane Group Flow (vph)	281	885	1329	0	10	162
Confl. Peds. (#/hr)	5			5		
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	113.5	113.5	83.3		14.1	14.1
Effective Green, g (s)	113.5	113.5	83.3		14.1	14.1
Actuated g/C Ratio	0.81	0.81	0.59		0.10	0.10
Clearance Time (s)	6.0	6.6	6.6		5.8	5.8
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Lane Grp Cap (vph)	436	2926	2122		181	275
v/s Ratio Prot	c0.11	0.25	0.37		0.01	
v/s Ratio Perm	c0.41					c0.06
w/c Ratio	0.64	0.30	0.63		0.06	0.59
Uniform Delay, d1	22.3	3.3	18.3		56.9	60.2
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.4	0.3	1.4		0.1	3.2
Delay (s)	25.7	3.6	19.7		57.1	63.4
Level of Service	C	A	B		E	E
Approach Delay (s)		8.9	19.7		63.2	
Approach LOS		A	B		E	

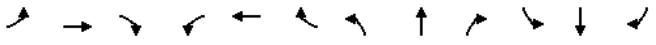
Intersection Summary

HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
3: St. Augustine Drive & Speers Road

02/28/2024




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕			↕				↕		↕	
Traffic Volume (vph)	10	810	25	0	1045	25	5	0	25	5	0	0
Future Volume (vph)	10	810	25	0	1045	25	5	0	25	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		1	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.996			0.997				0.865			
Flt Protected	0.950						0.950				0.950	
Satd. Flow (prot)	1805	3557	0	0	3564	0	0	0	1644	0	1805	0
Flt Permitted	0.950						0.950				0.950	
Satd. Flow (perm)	1805	3557	0	0	3564	0	0	0	1644	0	1805	0
Link Speed (k/h)		60			60				40			30
Link Distance (m)		248.1			235.8				188.1			117.6
Travel Time (s)		14.9			14.1				16.9			14.1
Confl. Peds. (#/hr)	8		5	5		8	1		1	1		1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	10	844	26	0	1089	26	5	0	26	5	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	870	0	0	1115	0	0	5	26	0	5	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6				0.0			0.0
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		1.6			1.6				1.6			1.6
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free				Stop			Stop

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
3: St. Augustine Drive & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕			↕				↕		↕	
Traffic Volume (veh/h)	10	810	25	0	1045	25	5	0	25	5	0	0
Future Volume (Veh/h)	10	810	25	0	1045	25	5	0	25	5	0	0
Sign Control		Free			Free				Stop			Stop
Grade		0%			0%				0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	10	844	26	0	1089	26	5	0	26	5	0	0
Pedestrians		1			1				5			8
Lane Width (m)		3.6			3.6				3.6			3.6
Walking Speed (m/s)		1.1			1.1				1.1			1.1
Percent Blockage		0			0				0			1
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)					236							
pX, platoon unblocked	0.81						0.81	0.81		0.81	0.81	0.81
vC, conflicting volume	1123				875		1428	2005	441	1579	2005	566
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	691				875		1066	1776	441	1252	1776	7
tC, single (s)	4.1				4.1		7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2				2.2		3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99				100		96	100	95	95	100	100
cM capacity (veh/h)	737				776		142	66	566	99	66	871
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1					
Volume Total	10	563	307	726	389	31	5					
Volume Left	10	0	0	0	0	5	5					
Volume Right	0	0	26	0	26	26	0					
cSH	737	1700	1700	1700	1700	382	99					
Volume to Capacity	0.01	0.33	0.18	0.43	0.23	0.08	0.05					
Queue Length 95th (m)	0.3	0.0	0.0	0.0	0.0	2.0	1.2					
Control Delay (s)	10.0	0.0	0.0	0.0	0.0	15.2	43.4					
Lane LOS	A					C	E					
Approach Delay (s)	0.1			0.0		15.2	43.4					
Approach LOS						C	E					
Intersection Summary												
Average Delay					0.4							
Intersection Capacity Utilization					Err%	ICU Level of Service			H			
Analysis Period (min)					15							

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	35	5	30	90	10	150	120	595	110	170	550	50
Future Volume (vph)	35	5	30	90	10	150	120	595	110	170	550	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	30.0		0.0	30.0		0.0	50.0		50.0	50.0		50.0
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor				0.98		0.98			0.97		1.00	
Frt		0.870			0.860			0.850			0.850	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1621	0	1752	1583	0	1770	3574	1583	1805	3574	1583
Flt Permitted	0.652			0.950			0.439			0.290		
Satd. Flow (perm)	1215	1621	0	1714	1583	0	818	3574	1537	550	3574	1583
Right Turn on Red			Yes			Yes		Yes			Yes	
Satd. Flow (RTOR)	33				155			113			65	
Link Speed (k/h)	48				50			50			50	
Link Distance (m)	84.8				265.3			167.2			94.4	
Travel Time (s)	6.4				19.1			12.0			6.8	
Confl. Peds. (#/hr)				13		6		4		4		
Peak Hour Factor	0.92	0.92	0.92	0.97	0.92	0.97	0.92	0.97	0.97	0.97	0.97	0.92
Heavy Vehicles (%)	2%	2%	2%	3%	2%	1%	2%	1%	2%	0%	1%	2%
Adj. Flow (vph)	38	5	33	93	11	155	130	613	113	175	567	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	38	38	0	93	166	0	130	613	113	175	567	54
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.6			3.6			3.6			3.6		
Link Offset(m)	0.0			0.0			0.0			0.0		
Crosswalk Width(m)	1.6			1.6			1.6			1.6		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	97		97	24		14	97		14	24		97
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

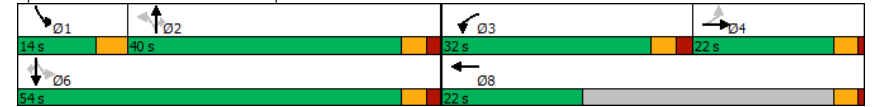
02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA		Prot	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8			2		2	1	6
Permitted Phases	4						2		2	6		6
Detector Phase	4	4		3	8		2	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		10.0	5.0		18.0	18.0	18.0	7.0	18.0	18.0
Minimum Split (s)	22.0	22.0		31.4	22.0		28.2	28.2	28.2	11.0	28.2	28.2
Total Split (s)	22.0	22.0		32.0	22.0		40.0	40.0	40.0	14.0	54.0	54.0
Total Split (%)	20.4%	20.4%		29.6%	20.4%		37.0%	37.0%	37.0%	13.0%	50.0%	50.0%
Maximum Green (s)	18.0	18.0		26.6	18.0		34.8	34.8	34.8	10.0	48.8	48.8
Yellow Time (s)	3.0	3.0		3.3	3.0		3.3	3.3	3.3	4.0	3.3	3.3
All-Red Time (s)	1.0	1.0		2.1	1.0		1.9	1.9	1.9	0.0	1.9	1.9
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0		5.4	4.0		5.2	5.2	5.2	4.0	5.2	5.2
Lead/Lag	Lag	Lag		Lead			Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		Yes			Yes	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.5	3.5	3.5	2.5	3.5	3.5
Recall Mode	None	None		None	None		Min	Min	Min	None	Min	Min
Walk Time (s)	7.0	7.0		10.0	7.0		10.0	10.0	10.0		10.0	10.0
Flash Dont Walk (s)	11.0	11.0		16.0	11.0		13.0	13.0	13.0		13.0	13.0
Pedestrian Calls (#/hr)	0	0		0	0		5	5	5		5	5
Act Effect Green (s)	7.9	7.9		11.2	17.8		21.6	21.6	21.6	35.8	34.6	34.6
Actuated g/C Ratio	0.13	0.13		0.18	0.29		0.35	0.35	0.35	0.58	0.56	0.56
v/c Ratio	0.25	0.16		0.30	0.29		0.46	0.49	0.19	0.35	0.29	0.06
Control Delay	33.3	15.1		29.7	5.5		25.4	19.2	5.0	10.4	9.2	2.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.3	15.1		29.7	5.5		25.4	19.2	5.0	10.4	9.2	2.4
LOS	C	B		C	A		C	B	A	B	A	A
Approach Delay		24.2			14.2			18.3				9.0
Approach LOS		C			B			B				A

Intersection Summary

Area Type:	Other
Cycle Length:	108
Actuated Cycle Length:	62.1
Natural Cycle:	95
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.49
Intersection Signal Delay:	14.3
Intersection Capacity Utilization:	60.9%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	B

Splits and Phases: 4: Kerr Street & Shepherd Road



Timings
4: Kerr Street & Shepherd Road

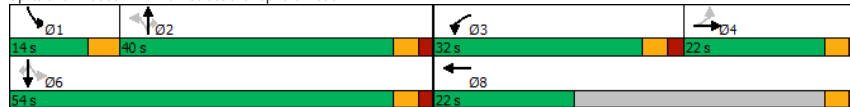
02/28/2024

	↖	→	↙	←	↘	↑	↗	↙	↓	↘
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↙	↘	↖	↗	↘	↙	↘	↗
Traffic Volume (vph)	35	5	90	10	120	595	110	170	550	50
Future Volume (vph)	35	5	90	10	120	595	110	170	550	50
Turn Type	Perm	NA	Prot	NA	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4	3	8		2		1	6	
Permitted Phases	4				2		2	6		6
Detector Phase	4	4	3	8	2	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	10.0	5.0	18.0	18.0	18.0	7.0	18.0	18.0
Minimum Split (s)	22.0	22.0	31.4	22.0	28.2	28.2	28.2	11.0	28.2	28.2
Total Split (s)	22.0	22.0	32.0	22.0	40.0	40.0	40.0	14.0	54.0	54.0
Total Split (%)	20.4%	20.4%	29.6%	20.4%	37.0%	37.0%	37.0%	13.0%	50.0%	50.0%
Yellow Time (s)	3.0	3.0	3.3	3.0	3.3	3.3	3.3	4.0	3.3	3.3
All-Red Time (s)	1.0	1.0	2.1	1.0	1.9	1.9	1.9	0.0	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	5.4	4.0	5.2	5.2	5.2	4.0	5.2	5.2
Lead/Lag	Lag	Lag	Lead		Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	Min	Min	Min	None	Min	Min
Act Effect Green (s)	7.9	7.9	11.2	17.8	21.6	21.6	21.6	35.8	34.6	34.6
Actuated g/C Ratio	0.13	0.13	0.18	0.29	0.35	0.35	0.35	0.58	0.56	0.56
v/c Ratio	0.25	0.16	0.30	0.29	0.46	0.49	0.19	0.35	0.29	0.06
Control Delay	33.3	15.1	29.7	5.5	25.4	19.2	5.0	10.4	9.2	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.3	15.1	29.7	5.5	25.4	19.2	5.0	10.4	9.2	2.4
LOS	C	B	C	A	C	B	A	B	A	A
Approach Delay		24.2		14.2		18.3			9.0	
Approach LOS		C		B		B			A	

Intersection Summary

Cycle Length: 108
 Actuated Cycle Length: 62.1
 Natural Cycle: 95
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.49
 Intersection Signal Delay: 14.3
 Intersection Capacity Utilization 60.9%
 Analysis Period (min) 15

Splits and Phases: 4: Kerr Street & Shepherd Road



Queues
4: Kerr Street & Shepherd Road

02/28/2024

	↖	→	↙	←	↘	↑	↗	↙	↓	↘
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	38	38	93	166	130	613	113	175	567	54
v/c Ratio	0.25	0.16	0.30	0.29	0.46	0.49	0.19	0.35	0.29	0.06
Control Delay	33.3	15.1	29.7	5.5	25.4	19.2	5.0	10.4	9.2	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.3	15.1	29.7	5.5	25.4	19.2	5.0	10.4	9.2	2.4
Queue Length 50th (m)	4.1	0.5	9.7	0.8	12.6	31.6	0.0	10.2	19.5	0.0
Queue Length 95th (m)	14.3	8.9	26.7	13.0	31.7	53.7	9.8	23.2	34.8	4.0
Internal Link Dist (m)		60.8		241.3		143.2			70.4	
Turn Bay Length (m)	30.0		30.0		50.0		50.0	50.0		50.0
Base Capacity (vph)	371	519	792	1328	484	2115	955	530	2882	1289
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.07	0.12	0.13	0.27	0.29	0.12	0.33	0.20	0.04

Intersection Summary

HCM Signalized Intersection Capacity Analysis

4: Kerr Street & Shepherd Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	35	5	30	90	10	150	120	595	110	170	550	50
Future Volume (vph)	35	5	30	90	10	150	120	595	110	170	550	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		5.4	4.0		5.2	5.2	5.2	4.0	5.2	5.2
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frb, ped/bikes	1.00	1.00		1.00	0.98		1.00	1.00	0.97	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.86		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1620		1752	1589		1770	3574	1543	1804	3574	1583
Flt Permitted	0.65	1.00		0.95	1.00		0.44	1.00	1.00	0.29	1.00	1.00
Satd. Flow (perm)	1215	1620		1752	1589		818	3574	1543	551	3574	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.97	0.92	0.97	0.92	0.97	0.97	0.97	0.97	0.92
Adj. Flow (vph)	38	5	33	93	11	155	130	613	113	175	567	54
RTOR Reduction (vph)	0	30	0	0	106	0	0	0	74	0	0	25
Lane Group Flow (vph)	38	8	0	93	60	0	130	613	39	175	567	29
Confl. Peds. (#/hr)				13		6			4	4		
Heavy Vehicles (%)	2%	2%	2%	3%	2%	1%	2%	1%	2%	0%	1%	2%
Turn Type	Perm	NA		Prot	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4						2	2	6		6	
Actuated Green, G (s)	6.3	6.3		8.3	20.0		21.8	21.8	21.8	34.5	34.5	34.5
Effective Green, g (s)	6.3	6.3		8.3	20.0		21.8	21.8	21.8	34.5	34.5	34.5
Actuated g/C Ratio	0.10	0.10		0.13	0.31		0.34	0.34	0.34	0.54	0.54	0.54
Clearance Time (s)	4.0	4.0		5.4	4.0		5.2	5.2	5.2	4.0	5.2	5.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.5	3.5	3.5	2.5	3.5	3.5
Lane Grp Cap (vph)	120	160		228	498		279	1223	528	469	1935	857
v/s Ratio Prot		0.01		c0.05	0.04			c0.17		c0.05	0.16	
v/s Ratio Perm	c0.03						0.16	0.03	0.15		0.02	
v/c Ratio	0.32	0.05		0.41	0.12		0.47	0.50	0.07	0.37	0.29	0.03
Uniform Delay, d1	26.7	26.0		25.4	15.6		16.4	16.6	14.1	8.0	8.0	6.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	0.1		1.2	0.1		1.5	0.4	0.1	0.4	0.1	0.0
Delay (s)	28.2	26.1		26.6	15.7		17.8	17.0	14.2	8.4	8.1	6.8
Level of Service	C	C		C	B		B	B	B	A	A	A
Approach Delay (s)		27.2			19.6			16.8			8.1	
Approach LOS		C			B			B			A	

Intersection Summary		
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.44	
Actuated Cycle Length (s)	63.7	Sum of lost time (s)
Intersection Capacity Utilization	60.9%	ICU Level of Service
Analysis Period (min)	15	

c Critical Lane Group

Lanes, Volumes, Timings

5: Kerr Street & Wycroft Road

02/28/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	25	165	135	645	605	110
Future Volume (vph)	25	165	135	645	605	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	75.0	0.0	75.0			0.0
Storage Lanes	1	1	1			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850			0.977	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1805	1553	1703	3610	3505	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1805	1553	1703	3610	3505	0
Link Speed (k/h)	50		50	50		
Link Distance (m)	561.6			394.3	98.1	
Travel Time (s)	40.4			28.4	7.1	
Confl. Peds. (#/hr)			5			5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	4%	6%	0%	0%	4%
Adj. Flow (vph)	27	176	144	686	644	117
Shared Lane Traffic (%)						
Lane Group Flow (vph)	27	176	144	686	761	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	41.1%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

5: Kerr Street & Wycroft Road

02/28/2024

Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Volume (veh/h)	25	165	135	645	605	110	
Future Volume (Veh/h)	25	165	135	645	605	110	
Sign Control	Stop		Free				
Grade	0%		0%				
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	
Hourly flow rate (vph)	27	176	144	686	644	117	
Pedestrians	5						
Lane Width (m)	3.6						
Walking Speed (m/s)	1.1						
Percent Blockage	0						
Right turn flare (veh)							
Median type			None		None		
Median storage (veh)							
Upstream signal (m)							
pX, platoon unblocked							
vC, conflicting volume	1338	386	766				
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol	1338	386	766				
tC, single (s)	6.8	7.0	4.2				
tC, 2 stage (s)							
tF (s)	3.5	3.3	2.3				
p0 queue free %	78	71	82				
cM capacity (veh/h)	120	604	814				
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	27	176	144	343	343	429	332
Volume Left	27	0	144	0	0	0	0
Volume Right	0	176	0	0	0	0	117
cSH	120	604	814	1700	1700	1700	1700
Volume to Capacity	0.22	0.29	0.18	0.20	0.20	0.25	0.20
Queue Length 95th (m)	6.2	9.2	4.9	0.0	0.0	0.0	0.0
Control Delay (s)	43.4	13.4	10.4	0.0	0.0	0.0	0.0
Lane LOS	E	B	B				
Approach Delay (s)	17.4		1.8	0.0			
Approach LOS	C						
Intersection Summary							
Average Delay			2.8				
Intersection Capacity Utilization			41.1%		ICU Level of Service A		
Analysis Period (min)			15				

Lanes, Volumes, Timings

6: Kerr Street & Prince Charles Drive

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	10	0	10	10	0	30	5	520	10	20	690	25	
Future Volume (vph)	10	0	10	10	0	30	5	520	10	20	690	25	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt	0.932		0.900		0.997		0.995						
Flt Protected	0.976		0.987		0.999		0.999						
Satd. Flow (prot)	0	1728	0	0	1688	0	0	1873	0	0	1849	0	
Flt Permitted	0.976		0.987		0.999		0.999						
Satd. Flow (perm)	0	1728	0	0	1688	0	0	1873	0	0	1849	0	
Link Speed (k/h)	40		40		50		50						
Link Distance (m)	57.8		56.0		134.8		127.4						
Travel Time (s)	5.2		5.0		9.7		9.2						
Confl. Peds. (#/hr)	4		1	1		4	21		31	31		21	
Confl. Bikes (#/hr)									1				
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Heavy Vehicles (%)	0%	50%	0%	0%	0%	0%	20%	1%	0%	5%	2%	4%	
Adj. Flow (vph)	11	0	11	11	0	32	5	547	11	21	726	26	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	22	0	0	43	0	0	563	0	0	773	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)	0.0		0.0		0.0		0.0		3.6				
Link Offset(m)	0.0		0.0		0.0		0.0		0.0				
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6				
Two way Left Turn Lane													
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (k/h)	24		14	24		14	24		14	24		14	
Sign Control	Stop		Stop		Free		Free		Free				
Intersection Summary													
Area Type:	Other												
Control Type:	Unsignalized												
Intersection Capacity Utilization	61.9%						ICU Level of Service B						
Analysis Period (min)	15												

HCM Unsignalized Intersection Capacity Analysis

6: Kerr Street & Prince Charles Drive

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	10	0	10	10	0	30	5	520	10	20	690	25
Future Volume (Veh/h)	10	0	10	10	0	30	5	520	10	20	690	25
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	0	11	11	0	32	5	547	11	21	726	26
Pedestrians	21			31			1			4		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	2			3			0			0		
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (m)							238			127		
pX, platoon unblocked	0.79	0.79	0.73	0.79	0.79	0.89	0.73				0.89	
vC, conflicting volume	1400	1401	761	1386	1408	588	773				589	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1054	1055	490	1037	1064	473	506				474	
tC, single (s)	7.1	7.0	6.2	7.1	6.5	6.2	4.3				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.5	3.3	3.5	4.0	3.3	2.4				2.2	
p0 queue free %	92	100	97	93	100	94	99				98	
cM capacity (veh/h)	140	136	418	148	164	512	698				925	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	22	43	563	773								
Volume Left	11	11	5	21								
Volume Right	11	32	11	26								
cSH	209	315	698	925								
Volume to Capacity	0.11	0.14	0.01	0.02								
Queue Length 95th (m)	2.6	3.6	0.2	0.5								
Control Delay (s)	24.2	18.2	0.2	0.6								
Lane LOS	C	C	A	A								
Approach Delay (s)	24.2	18.2	0.2	0.6								
Approach LOS	C	C										
Intersection Summary												
Average Delay	1.4											
Intersection Capacity Utilization	61.9%			ICU Level of Service			B					
Analysis Period (min)	15											

Lanes, Volumes, Timings

7: Kerr Street & Elmwood Road

02/28/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	15	10	5	520	670	40
Future Volume (vph)	15	10	5	520	670	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.945				0.992	
Fit Protected	0.971					
Satd. Flow (prot)	1675	0	0	1860	1843	0
Fit Permitted	0.971					
Satd. Flow (perm)	1675	0	0	1860	1843	0
Link Speed (k/h)	40		50		50	
Link Distance (m)	171.2		103.0		134.8	
Travel Time (s)	15.4		7.4		9.7	
Confl. Peds. (#/hr)	1	2	34			34
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	10%	20%	2%	2%	7%
Adj. Flow (vph)	16	11	5	547	705	42
Shared Lane Traffic (%)						
Lane Group Flow (vph)	27	0	0	552	747	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24	14		
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	48.5%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

7: Kerr Street & Elmwood Road

02/28/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↕		↔	
Traffic Volume (veh/h)	15	10	5	520	670	40
Future Volume (Veh/h)	15	10	5	520	670	40
Sign Control	Stop		Free			
Grade	0%		0%			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	11	5	547	705	42
Pedestrians	34		2		1	
Lane Width (m)	3.6		3.6		3.6	
Walking Speed (m/s)	1.1		1.1		1.1	
Percent Blockage	3		0		0	
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)			103		262	
pX, platoon unblocked	0.82	0.76	0.76			
vC, conflicting volume	1318	762	781			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	921	526	551			
tC, single (s)	6.4	6.3	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.4			
p0 queue free %	93	97	99			
cM capacity (veh/h)	240	393	686			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	27	552	747			
Volume Left	16	5	0			
Volume Right	11	0	42			
cSH	285	686	1700			
Volume to Capacity	0.09	0.01	0.44			
Queue Length 95th (m)	2.4	0.2	0.0			
Control Delay (s)	19.0	0.2	0.0			
Lane LOS	C	A				
Approach Delay (s)	19.0	0.2	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			48.5%		ICU Level of Service A	
Analysis Period (min)			15			

Lanes, Volumes, Timings

8: Kerr Street & Stewart Street

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↕		↕		↕		↕		↕	
Traffic Volume (vph)	50	10	15	10	15	75	10	400	15	55	575	50
Future Volume (vph)	50	10	15	10	15	75	10	400	15	55	575	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0		0.0		20.0		0.0		20.0	
Storage Lanes	0		0		0		1		0		1	
Taper Length (m)	2.5		2.5		2.5		2.5		2.5		2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.97		0.96		0.98		0.98		0.98		0.99	
Frt	0.973		0.898		0.995		0.988		0.988		0.988	
Flt Protected	0.968		0.995		0.950		0.950		0.950		0.950	
Satd. Flow (prot)	0	1705	0	0	1577	0	1805	1857	0	1787	1832	0
Flt Permitted	0.771		0.967		0.389		0.416		0.416		0.416	
Satd. Flow (perm)	0	1333	0	0	1530	0	725	1857	0	771	1832	0
Right Turn on Red			Yes		Yes		Yes		Yes		Yes	
Satd. Flow (RTOR)	16		82		3		9		9		9	
Link Speed (k/h)	40		40		50		50		50		50	
Link Distance (m)	95.6		60.6		165.0		103.0		103.0		103.0	
Travel Time (s)	8.6		5.5		11.9		7.4		7.4		7.4	
Confl. Peds. (#/hr)	20		15		15		20		35		25	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Adj. Flow (vph)	54	11	16	11	16	82	11	435	16	60	625	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	81	0	0	109	0	11	451	0	60	679	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0		0.0		3.6		3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6		1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24	14	24	14	24	14	24	14	24	14
Number of Detectors	1	2	1	2	1	2	1	2	1	2	1	2
Detector Template	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left	Thru
Leading Detector (m)	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4		9.4		9.4		9.4		9.4		9.4	
Detector 2 Size(m)	0.6		0.6		0.6		0.6		0.6		0.6	
Detector 2 Type	Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex		Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0		0.0		0.0		0.0		0.0		0.0	

Lanes, Volumes, Timings
8: Kerr Street & Stewart Street

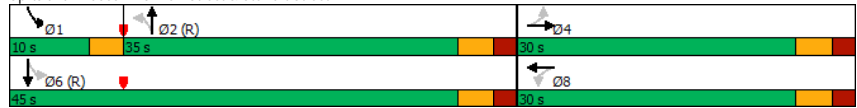
02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		24.0	24.0		6.0	24.0	
Minimum Split (s)	30.0	30.0		30.0	30.0		32.0	32.0		10.0	32.0	
Total Split (s)	30.0	30.0		30.0	30.0		35.0	35.0		10.0	45.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		46.7%	46.7%		13.3%	60.0%	
Maximum Green (s)	24.6	24.6		24.6	24.6		29.6	29.6		7.0	39.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.0	3.3	
All-Red Time (s)	2.1	2.1		2.1	2.1		2.1	2.1		0.0	2.1	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.4			5.4		5.4	5.4		3.0	5.4	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
Recall Mode	None	None		None	None		C-Min	C-Min		None	C-Min	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0		
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		14.0	14.0		14.0		
Pedestrian Calls (#/hr)	20	20		20	20		35	35		35		
Act Effect Green (s)		15.2			15.2		47.1	47.1		54.5	53.2	
Actuated g/C Ratio		0.20			0.20		0.63	0.63		0.73	0.71	
v/c Ratio		0.29			0.29		0.02	0.39		0.09	0.52	
Control Delay		21.5			9.9		12.7	13.0		5.9	10.1	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay		21.5			9.9		12.7	13.0		5.9	10.1	
LOS		C			A		B	B		A	B	
Approach Delay		21.5			9.9		13.0			9.7		
Approach LOS		C			A		B			A		

Intersection Summary

Area Type:	Other
Cycle Length:	75
Actuated Cycle Length:	75
Offset:	13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	75
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.52
Intersection Signal Delay:	11.5
Intersection Capacity Utilization:	69.0%
ICU Level of Service:	C
Intersection LOS:	B
Analysis Period (min):	15

Splits and Phases: 8: Kerr Street & Stewart Street



Timings
8: Kerr Street & Stewart Street

02/28/2024

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔		↔	↔	↔	↔	↔
Traffic Volume (vph)	50	10	10	15	10	400	55	575
Future Volume (vph)	50	10	10	15	10	400	55	575
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	24.0	24.0	6.0	24.0
Minimum Split (s)	30.0	30.0	30.0	30.0	32.0	32.0	10.0	32.0
Total Split (s)	30.0	30.0	30.0	30.0	35.0	35.0	10.0	45.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	46.7%	46.7%	13.3%	60.0%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.0	3.3
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	2.1
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		5.4		5.4	5.4	5.4	3.0	5.4
Lead/Lag					Lag	Lag	Lead	Lead
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	None	C-Min
Act Effect Green (s)		15.2		15.2	47.1	47.1	54.5	53.2
Actuated g/C Ratio		0.20		0.20	0.63	0.63	0.73	0.71
v/c Ratio		0.29		0.29	0.02	0.39	0.09	0.52
Control Delay		21.5		9.9	12.7	13.0	5.9	10.1
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		21.5		9.9	12.7	13.0	5.9	10.1
LOS		C		A	B	B	A	B
Approach Delay		21.5		9.9	13.0		9.7	
Approach LOS		C		A	B		A	

Intersection Summary

Cycle Length:	75
Actuated Cycle Length:	75
Offset:	13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle:	75
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.52
Intersection Signal Delay:	11.5
Intersection Capacity Utilization:	69.0%
ICU Level of Service:	C
Intersection LOS:	B
Analysis Period (min):	15

Splits and Phases: 8: Kerr Street & Stewart Street



Queues

8: Kerr Street & Stewart Street

02/28/2024



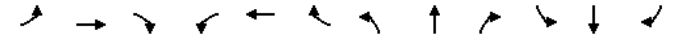
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	81	109	11	451	60	679
w/c Ratio	0.29	0.29	0.02	0.39	0.09	0.52
Control Delay	21.5	9.9	12.7	13.0	5.9	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.5	9.9	12.7	13.0	5.9	10.1
Queue Length 50th (m)	8.5	3.4	0.6	29.9	1.6	33.1
Queue Length 95th (m)	16.4	13.0	3.8	76.5	7.7	97.7
Internal Link Dist (m)	71.6	36.6		141.0		79.0
Turn Bay Length (m)			20.0		20.0	
Base Capacity (vph)	447	556	455	1168	657	1301
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced w/c Ratio	0.18	0.20	0.02	0.39	0.09	0.52

Intersection Summary

HCM Signalized Intersection Capacity Analysis

8: Kerr Street & Stewart Street

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (vph)	50	10	15	10	15	75	10	400	15	55	575	50
Future Volume (vph)	50	10	15	10	15	75	10	400	15	55	575	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.4			5.4		5.4	5.4		3.0	5.4	
Lane Util. Factor	1.00				1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	0.99				0.96		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.98				1.00		0.98	1.00		0.99	1.00	
Frt	0.97				0.90		1.00	0.99		1.00	0.99	
Flt Protected	0.97				0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1675				1575		1768	1857		1775	1833	
Flt Permitted	0.77				0.97		0.39	1.00		0.42	1.00	
Satd. Flow (perm)	1334				1530		724	1857		778	1833	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	11	16	11	16	82	11	435	16	60	625	54
RTOR Reduction (vph)	0	13	0	0	68	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	68	0	0	41	0	11	450	0	60	676	0
Confl. Peds. (#/hr)	20		15	15		20	35		25	25		35
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.2			13.2		43.8	43.8		51.0	51.0	
Effective Green, g (s)		13.2			13.2		43.8	43.8		51.0	51.0	
Actuated g/C Ratio		0.18			0.18		0.58	0.58		0.68	0.68	
Clearance Time (s)		5.4			5.4		5.4	5.4		3.0	5.4	
Vehicle Extension (s)		4.0			4.0		4.0	4.0		3.0	4.0	
Lane Grp Cap (vph)		234			269		422	1084		584	1246	
v/s Ratio Prot								0.24		0.01	c0.37	
v/s Ratio Perm		c0.05			0.03		0.02			0.06		
v/c Ratio		0.29			0.15		0.03	0.41		0.10	0.54	
Uniform Delay, d1		26.8			26.2		6.6	8.6		4.4	6.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.9			0.4		0.1	1.2		0.1	1.7	
Delay (s)		27.8			26.5		6.7	9.7		4.5	7.8	
Level of Service		C			C		A	A		A	A	
Approach Delay (s)		27.8			26.5		9.7			7.5		
Approach LOS		C			C		A			A		

Intersection Summary

HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	13.8
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

9: Speers Internal Road 1 & Speers Road

02/28/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (vph)	1085	60	0	1685	0	20
Future Volume (vph)	1085	60	0	1685	0	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.992					0.865
Flt Protected						
Satd. Flow (prot)	3581	0	0	3610	0	1644
Flt Permitted						
Satd. Flow (perm)	3581	0	0	3610	0	1644
Link Speed (k/h)	60			60	20	
Link Distance (m)	147.2			113.4	44.5	
Travel Time (s)	8.8			6.8	8.0	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1107	61	0	1719	0	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1168	0	0	1719	0	20
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	49.9%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

9: Speers Internal Road 1 & Speers Road

02/28/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (veh/h)	1085	60	0	1685	0	20
Future Volume (Veh/h)	1085	60	0	1685	0	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	1107	61	0	1719	0	20
Pedestrians	1			1		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	147			347		
pX, platoon unblocked			0.81		0.85	0.81
vC, conflicting volume			1168		1998	585
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			736		810	16
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			711		273	862

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	738	430	860	860	20
Volume Left	0	0	0	0	0
Volume Right	0	61	0	0	20
cSH	1700	1700	1700	1700	862
Volume to Capacity	0.43	0.25	0.51	0.51	0.02
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.5
Control Delay (s)	0.0	0.0	0.0	0.0	9.3
Lane LOS					A
Approach Delay (s)	0.0		0.0		9.3
Approach LOS					A

Intersection Summary

Average Delay	0.1
Intersection Capacity Utilization	49.9%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/28/2024

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	20	0	0	55	5
Future Volume (vph)	0	20	0	0	55	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected						0.956
Satd. Flow (prot)	1644	0	1900	0	0	1816
Flt Permitted						0.956
Satd. Flow (perm)	1644	0	1900	0	0	1816
Link Speed (k/h)	20		20		20	
Link Distance (m)	67.5		49.5		44.5	
Travel Time (s)	12.2		8.9		8.0	
Confl. Peds. (#/hr)	8					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	25	0	0	70	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	25	0	0	0	0	76
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	14		24	
Sign Control	Stop		Free		Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	15.7% ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/28/2024

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	20	0	0	55	5
Future Volume (Veh/h)	0	20	0	0	55	5
Sign Control	Stop		Free		Free	
Grade	0%					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	25	0	0	70	6
Pedestrians	2					
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0			1		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	148	8	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	148	8	0			
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			96	
cM capacity (veh/h)	811	1072			1636	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	25	0	76
Volume Left	0	0	70
Volume Right	25	0	0
cSH	1072	1700	1636
Volume to Capacity	0.02	0.00	0.04
Queue Length 95th (m)	0.5	0.0	1.0
Control Delay (s)	8.4	0.0	6.7
Lane LOS	A		A
Approach Delay (s)	8.4	0.0	6.7
Approach LOS	A		

Intersection Summary			
Average Delay	7.2		
Intersection Capacity Utilization	15.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings

12: Underground & Speers Internal Road

02/28/2024

	→	↖	↙	←	↘	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↗	↘	↙
Traffic Volume (vph)	25	25	20	10	15	10
Future Volume (vph)	25	25	20	10	15	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.932			0.945		
Flt Protected			0.968	0.971		
Satd. Flow (prot)	1771	0	0	1839	1743	0
Flt Permitted			0.968	0.971		
Satd. Flow (perm)	1771	0	0	1839	1743	0
Link Speed (k/h)	20		20	20		
Link Distance (m)	67.5		44.6	38.9		
Travel Time (s)	12.2		8.0	7.0		
Confl. Peds. (#/hr)				10		
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	32	32	25	13	19	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	64	0	0	38	32	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0		0.0	3.6		
Link Offset(m)	0.0		0.0	0.0		
Crosswalk Width(m)	1.6		1.6	1.6		
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		14	24	24	24	14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
 Control Type: Unsignalized
 Intersection Capacity Utilization 18.3% ICU Level of Service A
 Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis

12: Underground & Speers Internal Road

02/28/2024

	→	↖	↙	←	↘	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↗	↘	↙
Traffic Volume (veh/h)	25	25	20	10	15	10
Future Volume (Veh/h)	25	25	20	10	15	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	32	32	25	13	19	13
Pedestrians	10			3		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	1			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			64		121	51
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			64		121	51
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		98	99
cM capacity (veh/h)			1551		857	1020

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	64	38	32
Volume Left	0	25	19
Volume Right	32	0	13
cSH	1700	1551	917
Volume to Capacity	0.04	0.02	0.03
Queue Length 95th (m)	0.0	0.4	0.8
Control Delay (s)	0.0	4.9	9.1
Lane LOS		A	A
Approach Delay (s)	0.0	4.9	9.1
Approach LOS			A

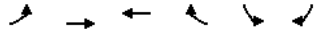
Intersection Summary

Average Delay 3.6
 Intersection Capacity Utilization 18.3% ICU Level of Service A
 Analysis Period (min) 15

Lanes, Volumes, Timings

13: Speers Internal Road/30 Speers & Speers Internal Road 2

02/28/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↓	
Traffic Volume (vph)	15	20	0	10	0	30
Future Volume (vph)	15	20	0	10	0	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865		0.865			
Flt Protected	0.979					
Satd. Flow (prot)	0	1713	1644	0	1467	0
Flt Permitted	0.979					
Satd. Flow (perm)	0	1713	1644	0	1467	0
Link Speed (k/h)	20		20			
Link Distance (m)	44.6		43.4		49.2	
Travel Time (s)	8.0		7.8		8.9	
Confl. Peds. (#/hr)	2		2		7	
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63
Heavy Vehicles (%)	20%	0%	0%	0%	0%	12%
Adj. Flow (vph)	24	32	0	16	0	48
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	56	16	0	48	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)	0.0		0.0		3.6	
Link Offset(m)	0.0		0.0			
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14		24	
Sign Control	Stop		Stop		Free	

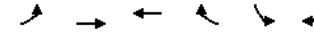
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.5%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

13: Speers Internal Road/30 Speers & Speers Internal Road 2

02/28/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↓	
Traffic Volume (veh/h)	15	20	0	10	0	30
Future Volume (Veh/h)	15	20	0	10	0	30
Sign Control	Stop		Stop		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63
Hourly flow rate (vph)	24	32	0	16	0	48
Pedestrians	3		7		2	
Lane Width (m)	3.6		3.6		3.6	
Walking Speed (m/s)	1.1		1.1		1.1	
Percent Blockage	0		1		0	
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	45	34	58	9	7	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	45	34	58	9	7	
tC, single (s)	7.3	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.7	4.0	4.0	3.3	2.2	
p0 queue free %	97	96	100	99	100	
cM capacity (veh/h)	890	855	829	1070	1616	

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	56	16	48
Volume Left	24	0	0
Volume Right	0	16	48
cSH	869	1070	1616
Volume to Capacity	0.06	0.01	0.00
Queue Length 95th (m)	1.6	0.3	0.0
Control Delay (s)	9.4	8.4	0.0
Lane LOS	A	A	
Approach Delay (s)	9.4	8.4	0.0
Approach LOS	A	A	

Intersection Summary

Average Delay	5.5		
Intersection Capacity Utilization	18.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (vph)	0	1105	5	25	1660	0	20	0	10	5	0	5
Future Volume (vph)	0	1105	5	25	1660	0	20	0	10	5	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.999				0.954				0.932			
Flt Protected					0.999				0.968			
Satd. Flow (prot)	0	3536	0	0	3537	0	0	1755	0	0	1694	0
Flt Permitted					0.999				0.968			
Satd. Flow (perm)	0	3536	0	0	3537	0	0	1755	0	0	1694	0
Link Speed (k/h)	60				60				20			
Link Distance (m)	113.4				233.1				49.2			
Travel Time (s)	6.8				14.0				8.9			
Confl. Peds. (#/hr)	8				8							
Confl. Bikes (#/hr)	1											
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	2%	0%	2%	2%	2%
Adj. Flow (vph)	0	1163	5	26	1747	0	21	0	11	5	0	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1168	0	0	1773	0	0	32	0	0	10	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.6				3.6				0.0			
Link Offset(m)	0.0				0.0				0.0			
Crosswalk Width(m)	1.6				1.6				1.6			
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14		24		14		24		14	
Sign Control	Free				Free				Stop			

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	73.6%
ICU Level of Service	D
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (veh/h)	0	1105	5	25	1660	0	20	0	10	5	0	5
Future Volume (Veh/h)	0	1105	5	25	1660	0	20	0	10	5	0	5
Sign Control	Free				Free				Stop			
Grade	0%											
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Hourly flow rate (vph)	0	1163	5	26	1747	0	21	0	11	5	0	5
Pedestrians	4											
Lane Width (m)	3.6				3.6				3.6			
Walking Speed (m/s)	1.1				1.1				1.1			
Percent Blockage	0				0				1			
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (m)	261				233							
pX, platoon unblocked	0.75				0.83				0.83			
vC, conflicting volume	1747				1176				2108			
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1329				812				1031			
tC, single (s)	4.1				4.1				7.5			
tC, 2 stage (s)												
tF (s)	2.2				2.2				3.5			
p0 queue free %	100				96				86			
cM capacity (veh/h)	386				681				150			

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	775	393	608	1165	32	10
Volume Left	0	0	26	0	21	5
Volume Right	0	5	0	0	11	5
cSH	1700	1700	681	1700	207	146
Volume to Capacity	0.46	0.23	0.04	0.69	0.15	0.07
Queue Length 95th (m)	0.0	0.0	0.9	0.0	4.1	1.7
Control Delay (s)	0.0	0.0	1.0	0.0	25.5	31.5
Lane LOS	A		D		D	
Approach Delay (s)	0.0		0.4		25.5	
Approach LOS	D		D		D	

Intersection Summary

Average Delay	0.6					
Intersection Capacity Utilization	73.6%			ICU Level of Service		
Analysis Period (min)	15					

Scenario #2

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

02/28/2024

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖		↙	↖	↖	↖	↖	↖	↙	↙	↙
Traffic Volume (vph)	35	605	85	180	435	175	95	95	365	345	135	70
Future Volume (vph)	35	605	85	180	435	175	95	95	365	345	135	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	105.0		0.0	75.0		100.0	50.0		45.0	0.0		0.0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	1.00		1.00		0.94	0.96		0.93	0.95		0.98
Frt		0.982				0.850			0.850		0.949	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3469	0	1752	3539	1583	1787	1900	1599	1787	1759	0
Flt Permitted	0.488			0.262			0.623			0.600		
Satd. Flow (perm)	904	3469	0	482	3539	1485	1120	1900	1486	1074	1759	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13				184			266		26	
Link Speed (kh)		60			60			50			50	
Link Distance (m)		235.8			147.2			127.4			167.2	
Travel Time (s)		14.1			8.8			9.2			12.0	
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Adj. Flow (vph)	37	637	89	189	458	184	100	100	384	363	142	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	726	0	189	458	184	100	100	384	363	216	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

EXAM 50 Speers Road 5:24 pm 02/28/2024 Existing AM
BA Group - SUK

Synchro 11 Report
Page 1

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

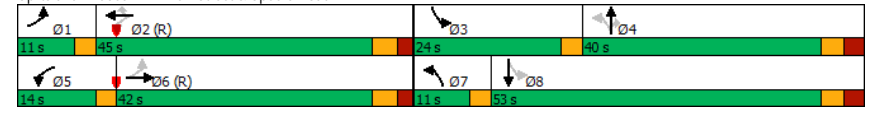
02/28/2024

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2		2	4		4	8		
Detector Phase	1	6		5	2	2	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	7.0	25.0		7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0	
Minimum Split (s)	10.0	30.9		10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3	
Total Split (s)	11.0	42.0		14.0	45.0	45.0	11.0	40.0	40.0	24.0	53.0	
Total Split (%)	9.2%	35.0%		11.7%	37.5%	37.5%	9.2%	33.3%	33.3%	20.0%	44.2%	
Maximum Green (s)	8.0	36.1		11.0	39.1	39.1	8.0	33.7	33.7	21.0	46.7	
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	
All-Red Time (s)	0.0	2.2		0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	5.5		2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	
Walk Time (s)		7.0			7.0	7.0		7.0		7.0		
Flash Dont Walk (s)		14.0			14.0	14.0		14.0		14.0		
Pedestrian Calls (#/hr)		15			15	15		35		35		
Act Effect Green (s)	59.8	49.7		66.7	57.6	57.6	31.3	19.6	19.6	47.3	32.6	
Actuated g/C Ratio	0.50	0.41		0.56	0.48	0.48	0.26	0.16	0.16	0.39	0.27	
v/c Ratio	0.07	0.50		0.49	0.27	0.23	0.30	0.32	0.83	0.66	0.43	
Control Delay	15.9	29.3		19.9	22.0	4.4	24.7	44.5	29.3	32.7	32.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	15.9	29.3		19.9	22.0	4.4	24.7	44.5	29.3	32.7	32.6	
LOS	B	C		B	C	A	C	D	C	C	C	
Approach Delay		28.7			17.6			31.1			32.7	
Approach LOS		C			B			C			C	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	43 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.83
Intersection Signal Delay:	26.7
Intersection Capacity Utilization:	81.4%
Intersection LOS:	C
ICU Level of Service:	D
Analysis Period (min):	15

Splits and Phases: 1: Kerr Street & Speers Road



EXAM 50 Speers Road 5:24 pm 02/28/2024 Existing AM
BA Group - SUK

Synchro 11 Report
Page 2

Timings
1: Kerr Street & Speers Road

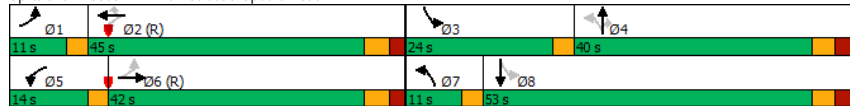
02/28/2024

	↖	→	↙	←	↘	↖	↙	↘	↖	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	35	605	180	435	175	95	95	365	345	135
Future Volume (vph)	35	605	180	435	175	95	95	365	345	135
Turn Type	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	1	6	5	2		7	4		3	8
Permitted Phases	6	2	2	4	4	4	8			
Detector Phase	1	6	5	2	2	7	4	4	3	8
Switch Phase										
Minimum Initial (s)	7.0	25.0	7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0
Minimum Split (s)	10.0	30.9	10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3
Total Split (s)	11.0	42.0	14.0	45.0	45.0	11.0	40.0	40.0	24.0	53.0
Total Split (%)	9.2%	35.0%	11.7%	37.5%	37.5%	9.2%	33.3%	33.3%	20.0%	44.2%
Yellow Time (s)	3.0	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3
All-Red Time (s)	0.0	2.2	0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	None	C-Min	C-Min	None	None	None	None	None
Act Effect Green (s)	59.8	49.7	66.7	57.6	57.6	31.3	19.6	19.6	47.3	32.6
Actuated g/C Ratio	0.50	0.41	0.56	0.48	0.48	0.26	0.16	0.16	0.39	0.27
v/c Ratio	0.07	0.50	0.49	0.27	0.23	0.30	0.32	0.83	0.66	0.43
Control Delay	15.9	29.3	19.9	22.0	4.4	24.7	44.5	29.3	32.7	32.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.9	29.3	19.9	22.0	4.4	24.7	44.5	29.3	32.7	32.6
LOS	B	C	B	C	A	C	D	C	C	C
Approach Delay		28.7		17.6			31.1			32.7
Approach LOS		C		B			C			C

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 43 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.83
 Intersection Signal Delay: 26.7
 Intersection LOS: C
 Intersection Capacity Utilization 81.4%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 1: Kerr Street & Speers Road



Queues
1: Kerr Street & Speers Road

02/28/2024

	↖	→	↙	←	↘	↖	↙	↘	↖	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	37	726	189	458	184	100	100	384	363	216
v/c Ratio	0.07	0.50	0.49	0.27	0.23	0.30	0.32	0.83	0.66	0.43
Control Delay	15.9	29.3	19.9	22.0	4.4	24.7	44.5	29.3	32.7	32.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.9	29.3	19.9	22.0	4.4	24.7	44.5	29.3	32.7	32.6
Queue Length 50th (m)	4.0	67.6	22.4	36.7	0.0	14.3	20.8	26.7	61.6	36.0
Queue Length 95th (m)	10.8	99.2	41.7	56.6	14.9	22.1	32.8	58.0	77.1	50.9
Internal Link Dist (m)		211.8		123.2			103.4			143.2
Turn Bay Length (m)	105.0		75.0		100.0	50.0		45.0		
Base Capacity (vph)	516	1444	396	1700	808	341	533	608	552	700
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.50	0.48	0.27	0.23	0.29	0.19	0.63	0.66	0.31

Intersection Summary

HCM Signalized Intersection Capacity Analysis

1: Kerr Street & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	35	605	85	180	435	175	95	95	365	345	135	70
Future Volume (vph)	35	605	85	180	435	175	95	95	365	345	135	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frb, ped/bikes	1.00	1.00		1.00	1.00	0.94	1.00	1.00	0.93	1.00	0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00	1.00	0.97	1.00	1.00	0.97	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1782	3468		1751	3539	1485	1739	1900	1486	1737	1759	
Flt Permitted	0.49	1.00		0.26	1.00	1.00	0.62	1.00	1.00	0.60	1.00	
Satd. Flow (perm)	916	3468		483	3539	1485	1141	1900	1486	1098	1759	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	37	637	89	189	458	184	100	100	384	363	142	74
RTOR Reduction (vph)	0	8	0	0	0	97	0	0	223	0	19	0
Lane Group Flow (vph)	37	718	0	189	458	87	100	100	161	363	197	0
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2		2	4		4	8		
Actuated Green, G (s)	54.2	49.8		63.9	56.5	56.5	27.9	19.6	19.6	43.9	32.6	
Effective Green, g (s)	54.2	49.8		63.9	56.5	56.5	27.9	19.6	19.6	43.9	32.6	
Actuated g/C Ratio	0.45	0.41		0.53	0.47	0.47	0.23	0.16	0.16	0.37	0.27	
Clearance Time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Vehicle Extension (s)	2.5	5.5		2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	
Lane Grp Cap (vph)	445	1439		374	1666	699	306	310	242	515	477	
v/s Ratio Prot	0.00	0.21		c0.05	0.13		0.02	0.05		c0.13	0.11	
v/s Ratio Perm	0.03			c0.22		0.06	0.05		0.11	c0.13		
v/c Ratio	0.08	0.50		0.51	0.27	0.12	0.33	0.32	0.67	0.70	0.41	
Uniform Delay, d1	18.4	25.9		16.2	19.3	17.8	37.5	44.3	47.1	30.6	35.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	1.2		0.8	0.4	0.4	0.5	0.8	7.4	4.0	0.8	
Delay (s)	18.5	27.1		17.0	19.7	18.2	38.0	45.2	54.6	34.6	36.6	
Level of Service	B	C		B	B	B	D	D	D	C	D	
Approach Delay (s)		26.7			18.7			50.1			35.4	
Approach LOS		C			B			D			D	

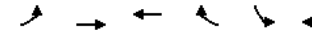
Intersection Summary			
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

2: Speers Road & Cross Avenue

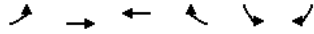
02/28/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	185	1155	560	20	5	220
Future Volume (vph)	185	1155	560	20	5	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	80.0		0.0	45.0	0.0	
Storage Lanes	1		0	1	2	
Taper Length (m)	2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	0.88
Ped Bike Factor	1.00		1.00			
Frt			0.995			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1703	3610	3554	0	1805	2733
Flt Permitted	0.395				0.950	
Satd. Flow (perm)	706	3610	3554	0	1805	2733
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			4			229
Link Speed (k/h)		60	60		48	
Link Distance (m)		233.1	101.5		84.0	
Travel Time (s)		14.0	6.1		6.3	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Adj. Flow (vph)	193	1203	583	21	5	229
Shared Lane Traffic (%)						
Lane Group Flow (vph)	193	1203	604	0	5	229
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
2: Speers Road & Cross Avenue

02/28/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Detector Phase	5	2	6		4	4
Switch Phase						
Minimum Initial (s)	6.0	38.0	38.0		10.0	10.0
Minimum Split (s)	12.0	47.6	47.6		15.8	15.8
Total Split (s)	35.0	109.0	74.0		31.0	31.0
Total Split (%)	25.0%	77.9%	52.9%		22.1%	22.1%
Maximum Green (s)	29.0	102.4	67.4		25.2	25.2
Yellow Time (s)	4.0	3.7	3.7		3.3	3.3
All-Red Time (s)	2.0	2.9	2.9		2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6		5.8	5.8
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Recall Mode	None	C-Min	C-Min		None	None
Walk Time (s)		10.0	10.0			
Flash Dont Walk (s)		31.0	31.0			
Pedestrian Calls (#/hr)		5	5			
Act Effect Green (s)	118.0	117.4	102.6		10.2	10.2
Actuated g/C Ratio	0.84	0.84	0.73		0.07	0.07
v/c Ratio	0.29	0.40	0.23		0.04	0.56
Control Delay	3.1	3.2	6.3		61.0	12.9
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	3.1	3.2	6.3		61.0	12.9
LOS	A	A	A		E	B
Approach Delay		3.2	6.3		13.9	
Approach LOS		A	A		B	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 99 (71%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.56
 Intersection Signal Delay: 5.1 Intersection LOS: A
 Intersection Capacity Utilization 68.1% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: Speers Road & Cross Avenue



Timings
2: Speers Road & Cross Avenue

02/28/2024

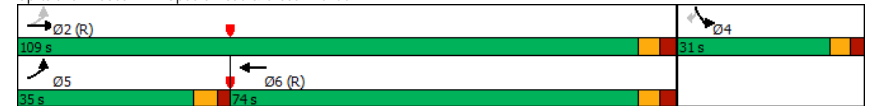


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↕↕	↕↕	↔	↕↕
Traffic Volume (vph)	185	1155	560	5	220
Future Volume (vph)	185	1155	560	5	220
Turn Type	pm+pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2				4
Detector Phase	5	2	6	4	4
Switch Phase					
Minimum Initial (s)	6.0	38.0	38.0	10.0	10.0
Minimum Split (s)	12.0	47.6	47.6	15.8	15.8
Total Split (s)	35.0	109.0	74.0	31.0	31.0
Total Split (%)	25.0%	77.9%	52.9%	22.1%	22.1%
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	None	None
Act Effect Green (s)	118.0	117.4	102.6	10.2	10.2
Actuated g/C Ratio	0.84	0.84	0.73	0.07	0.07
v/c Ratio	0.29	0.40	0.23	0.04	0.56
Control Delay	3.1	3.2	6.3	61.0	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.1	3.2	6.3	61.0	12.9
LOS	A	A	A	E	B
Approach Delay		3.2	6.3	13.9	
Approach LOS		A	A	B	

Intersection Summary

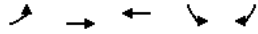
Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 99 (71%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.56
 Intersection Signal Delay: 5.1 Intersection LOS: A
 Intersection Capacity Utilization 68.1% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: Speers Road & Cross Avenue



Queues
2: Speers Road & Cross Avenue

02/28/2024

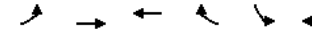


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	193	1203	604	5	229
w/c Ratio	0.29	0.40	0.23	0.04	0.56
Control Delay	3.1	3.2	6.3	61.0	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.1	3.2	6.3	61.0	12.9
Queue Length 50th (m)	7.3	32.9	25.0	1.3	0.0
Queue Length 95th (m)	11.7	40.9	34.1	5.8	13.9
Internal Link Dist (m)		209.1	77.5	60.0	
Turn Bay Length (m)	80.0		45.0		
Base Capacity (vph)	801	3028	2606	324	679
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.24	0.40	0.23	0.02	0.34

Intersection Summary

HCM Signalized Intersection Capacity Analysis
2: Speers Road & Cross Avenue

02/28/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕↕	↕↕		↔	↕↕
Traffic Volume (vph)	185	1155	560	20	5	220
Future Volume (vph)	185	1155	560	20	5	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.6	6.6		5.8	5.8
Lane Util. Factor	1.00	0.95	0.95		1.00	0.88
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1701	3610	3553		1805	2733
Flt Permitted	0.39	1.00	1.00		0.95	1.00
Satd. Flow (perm)	706	3610	3553		1805	2733
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	193	1203	583	21	5	229
RTOR Reduction (vph)	0	0	1	0	0	212
Lane Group Flow (vph)	193	1203	603	0	5	17
Confl. Peds. (#/hr)	5			5		
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	117.4	117.4	102.6		10.2	10.2
Effective Green, g (s)	117.4	117.4	102.6		10.2	10.2
Actuated g/C Ratio	0.84	0.84	0.73		0.07	0.07
Clearance Time (s)	6.0	6.6	6.6		5.8	5.8
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Lane Grp Cap (vph)	654	3027	2603		131	199
v/s Ratio Prot	0.02	c0.33	0.17		0.00	
v/s Ratio Perm	0.23					c0.01
w/c Ratio	0.30	0.40	0.23		0.04	0.08
Uniform Delay, d1	2.3	2.7	6.0		60.3	60.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.3	0.4	0.2		0.1	0.2
Delay (s)	2.6	3.1	6.2		60.5	60.7
Level of Service	A	A	A		E	E
Approach Delay (s)		3.1	6.2		60.7	
Approach LOS		A	A		E	

Intersection Summary

HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

3: St. Augustine Drive & Speers Road

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕			↕				↕		↕	
Traffic Volume (vph)	5	675	15	0	580	20	5	0	50	0	0	0
Future Volume (vph)	5	675	15	0	580	20	5	0	50	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0			0			1			0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.995				0.865			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1805	3561	0	0	3558	0	0	0	1644	0	1900	0
Flt Permitted	0.950							0.950				
Satd. Flow (perm)	1805	3561	0	0	3558	0	0	0	1644	0	1900	0
Link Speed (k/h)		60			60				40			30
Link Distance (m)		248.1			235.8				188.1			117.6
Travel Time (s)		14.9			14.1				16.9			14.1
Confl. Peds. (#/hr)	8		5	5		8	1		1	1		1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	5	703	16	0	604	21	5	0	52	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	719	0	0	625	0	0	5	52	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6				0.0			0.0
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		1.6			1.6				1.6			1.6
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free				Stop			Stop

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

3: St. Augustine Drive & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕			↕				↕		↕	
Traffic Volume (veh/h)	5	675	15	0	580	20	5	0	50	0	0	0
Future Volume (Veh/h)	5	675	15	0	580	20	5	0	50	0	0	0
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	703	16	0	604	21	5	0	52	0	0	0
Pedestrians	1			1			5			8		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	0			0			0			1		
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)	236											
pX, platoon unblocked	0.93						0.93			0.93		
vC, conflicting volume	633			724			1029			1359		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	459			724			884			1238		
tC, single (s)	4.1			4.1			7.5			6.5		
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5			4.0		
p0 queue free %	100			100			98			100		
cM capacity (veh/h)	1029			884			222			162		

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	5	469	250	403	222	57	0
Volume Left	5	0	0	0	0	5	0
Volume Right	0	0	16	0	21	52	0
cSH	1029	1700	1700	1700	1700	545	1700
Volume to Capacity	0.00	0.28	0.15	0.24	0.13	0.10	0.00
Queue Length 95th (m)	0.1	0.0	0.0	0.0	0.0	2.6	0.0
Control Delay (s)	8.5	0.0	0.0	0.0	0.0	12.4	0.0
Lane LOS	A				B		A
Approach Delay (s)	0.1			0.0			12.4
Approach LOS				B			A

Intersection Summary	
Average Delay	0.5
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min)	15

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

02/28/2024

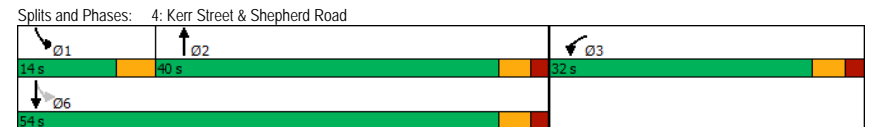
	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙		↖			↘
Traffic Volume (vph)	70	145	250	55	90	480
Future Volume (vph)	70	145	250	55	90	480
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor	0.98		1.00			1.00
Frt	0.909		0.973			
Flt Protected	0.984					0.992
Satd. Flow (prot)	1652	0	3454	0	0	3551
Flt Permitted	0.984					0.846
Satd. Flow (perm)	1645	0	3454	0	0	3026
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	125		37			
Link Speed (kh)	50		50			50
Link Distance (m)	265.3		167.2			26.5
Travel Time (s)	19.1		12.0			1.9
Confl. Peds. (#/hr)	13	6		4	4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	1%	1%	2%	0%	1%
Adj. Flow (vph)	72	149	258	57	93	495
Shared Lane Traffic (%)						
Lane Group Flow (vph)	221	0	315	0	0	588
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1		2		1	2
Detector Template	Left		Thru		Left	Thru
Leading Detector (m)	2.0		10.0		2.0	10.0
Trailing Detector (m)	0.0		0.0		0.0	0.0
Detector 1 Position(m)	0.0		0.0		0.0	0.0
Detector 1 Size(m)	2.0		0.6		2.0	0.6
Detector 1 Type	CI+Ex		CI+Ex		CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0		0.0	0.0
Detector 1 Queue (s)	0.0		0.0		0.0	0.0
Detector 1 Delay (s)	0.0		0.0		0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			CI+Ex			CI+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases						6

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

02/28/2024

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase					1	6
Switch Phase						
Minimum Initial (s)	10.0		18.0		7.0	18.0
Minimum Split (s)	31.4		28.2		11.0	28.2
Total Split (s)	32.0		40.0		14.0	54.0
Total Split (%)	37.2%		46.5%		16.3%	62.8%
Maximum Green (s)	26.6		34.8		10.0	48.8
Yellow Time (s)	3.3		3.3		4.0	3.3
All-Red Time (s)	2.1		1.9		0.0	1.9
Lost Time Adjust (s)	0.0		0.0			0.0
Total Lost Time (s)	5.4		5.2			5.2
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.5		2.5	3.5
Recall Mode	None		Min		None	Min
Walk Time (s)	10.0		10.0			10.0
Flash Dont Walk (s)	16.0		13.0			13.0
Pedestrian Calls (#/hr)	0		5			5
Act Effect Green (s)	10.3		19.3			19.3
Actuated g/C Ratio	0.26		0.48			0.48
v/c Ratio	0.43		0.19			0.40
Control Delay	9.3		5.6			7.8
Queue Delay	0.0		0.0			0.0
Total Delay	9.3		5.6			7.8
LOS	A		A			A
Approach Delay	9.3		5.6			7.8
Approach LOS	A		A			A

Intersection Summary	
Area Type:	Other
Cycle Length:	86
Actuated Cycle Length:	40.3
Natural Cycle:	75
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.43
Intersection Signal Delay:	7.5
Intersection Capacity Utilization:	59.3%
Intersection LOS:	A
ICU Level of Service:	B
Analysis Period (min):	15



Timings
4: Kerr Street & Shepherd Road

02/28/2024

	↙	↑	↘	↓
Lane Group	WBL	NBT	SBL	SBT
Lane Configurations	↔	↑↓	↔	↑↓
Traffic Volume (vph)	70	250	90	480
Future Volume (vph)	70	250	90	480
Turn Type	Prot	NA	pm+pt	NA
Protected Phases	3	2	1	6
Permitted Phases	6			
Detector Phase	3	2	1	6
Switch Phase				
Minimum Initial (s)	10.0	18.0	7.0	18.0
Minimum Split (s)	31.4	28.2	11.0	28.2
Total Split (s)	32.0	40.0	14.0	54.0
Total Split (%)	37.2%	46.5%	16.3%	62.8%
Yellow Time (s)	3.3	3.3	4.0	3.3
All-Red Time (s)	2.1	1.9	0.0	1.9
Lost Time Adjust (s)	0.0	0.0		0.0
Total Lost Time (s)	5.4	5.2		5.2
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	None	Min	None	Min
Act Effect Green (s)	10.3	19.3		19.3
Actuated g/C Ratio	0.26	0.48		0.48
v/c Ratio	0.43	0.19		0.40
Control Delay	9.3	5.6		7.8
Queue Delay	0.0	0.0		0.0
Total Delay	9.3	5.6		7.8
LOS	A	A		A
Approach Delay	9.3	5.6		7.8
Approach LOS	A	A		A

Intersection Summary

Cycle Length: 86
 Actuated Cycle Length: 40.3
 Natural Cycle: 75
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.43
 Intersection Signal Delay: 7.5
 Intersection Capacity Utilization 59.3%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 4: Kerr Street & Shepherd Road



Queues
4: Kerr Street & Shepherd Road

02/28/2024

	↙	↑	↓
Lane Group	WBL	NBT	SBT
Lane Group Flow (vph)	221	315	588
v/c Ratio	0.43	0.19	0.40
Control Delay	9.3	5.6	7.8
Queue Delay	0.0	0.0	0.0
Total Delay	9.3	5.6	7.8
Queue Length 50th (m)	4.9	4.9	11.8
Queue Length 95th (m)	18.8	10.0	21.2
Internal Link Dist (m)	241.3	143.2	2.5
Turn Bay Length (m)			
Base Capacity (vph)	1137	3001	3026
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.19	0.10	0.19

Intersection Summary

HCM Signalized Intersection Capacity Analysis

4: Kerr Street & Shepherd Road

02/28/2024



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↕	↕	↔	↔
Traffic Volume (vph)	70	145	250	55	90	480
Future Volume (vph)	70	145	250	55	90	480
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4		5.2			5.2
Lane Util. Factor	1.00		0.95			0.95
Frb, ped/bikes	0.99		1.00			1.00
Flpb, ped/bikes	1.00		1.00			1.00
Frt	0.91		0.97			1.00
Flt Protected	0.98		1.00			0.99
Satd. Flow (prot)	1655		3456			3551
Flt Permitted	0.98		1.00			0.85
Satd. Flow (perm)	1655		3456			3028
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	72	149	258	57	93	495
RTOR Reduction (vph)	93	0	19	0	0	0
Lane Group Flow (vph)	128	0	296	0	0	588
Confl. Peds. (#/hr)	13	6		4	4	
Heavy Vehicles (%)	3%	1%	1%	2%	0%	1%
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases					6	
Actuated Green, G (s)	10.3		19.3			19.3
Effective Green, g (s)	10.3		19.3			19.3
Actuated g/C Ratio	0.26		0.48			0.48
Clearance Time (s)	5.4		5.2			5.2
Vehicle Extension (s)	3.0		3.5			3.5
Lane Grp Cap (vph)	424		1659			1453
v/s Ratio Prot	c0.08		0.09			
v/s Ratio Perm						c0.19
v/c Ratio	0.30		0.18			0.40
Uniform Delay, d1	12.1		5.9			6.7
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	0.4		0.1			0.2
Delay (s)	12.5		6.0			7.0
Level of Service	B		A			A
Approach Delay (s)	12.5		6.0			7.0
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	40.2	Sum of lost time (s)	14.6
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

5: Kerr Street & Wyecroft Road

02/28/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↕	↕	↕	↕
Traffic Volume (vph)	5	80	160	235	490	125
Future Volume (vph)	5	80	160	235	490	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	75.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.872				0.973	
Flt Protected	0.997		0.950			
Satd. Flow (prot)	1592	0	1703	1900	1834	0
Flt Permitted	0.997		0.950			
Satd. Flow (perm)	1592	0	1703	1900	1834	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	561.6			442.6	98.1	
Travel Time (s)	40.4			31.9	7.1	
Confl. Peds. (#/hr)			5			5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	4%	6%	0%	0%	4%
Adj. Flow (vph)	5	85	170	250	521	133
Shared Lane Traffic (%)						
Lane Group Flow (vph)	90	0	170	250	654	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Right	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	57.6%
ICU Level of Service	B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

5: Kerr Street & Wynecroft Road

02/28/2024

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	80	160	235	490	125
Future Volume (Veh/h)	5	80	160	235	490	125
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	5	85	170	250	521	133
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1182	592	659			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1182	592	659			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	97	83	81			
cM capacity (veh/h)	171	500	906			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	90	170	250	654		
Volume Left	5	170	0	0		
Volume Right	85	0	0	133		
cSH	452	906	1700	1700		
Volume to Capacity	0.20	0.19	0.15	0.38		
Queue Length 95th (m)	5.6	5.2	0.0	0.0		
Control Delay (s)	14.9	9.9	0.0	0.0		
Lane LOS	B	A				
Approach Delay (s)	14.9	4.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay	2.6					
Intersection Capacity Utilization	57.6%		ICU Level of Service		B	
Analysis Period (min)	15					

Lanes, Volumes, Timings

6: Kerr Street & Prince Charles Drive

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	5	0	5	5	0	75	5	475	5	40	355	5	
Future Volume (vph)	5	0	5	5	0	75	5	475	5	40	355	5	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt	0.932			0.873			0.999			0.998			
Flt Protected	0.976			0.997						0.995			
Satd. Flow (prot)	0	1728	0	0	1654	0	0	1876	0	0	1844	0	
Flt Permitted	0.976			0.997						0.995			
Satd. Flow (perm)	0	1728	0	0	1654	0	0	1876	0	0	1844	0	
Link Speed (k/h)	40			40			50			50			
Link Distance (m)	57.8			56.0			134.8			127.4			
Travel Time (s)	5.2			5.0			9.7			9.2			
Confl. Peds. (#/hr)	4	1		1		4	21	31		31	21		
Confl. Bikes (#/hr)									1	1			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Heavy Vehicles (%)	0%	50%	0%	0%	0%	0%	20%	1%	0%	5%	2%	4%	
Adj. Flow (vph)	5	0	5	5	0	79	5	500	5	42	374	5	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	10	0	0	84	0	0	510	0	0	421	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)	0.0			0.0			0.0			3.6			
Link Offset(m)	0.0			0.0			0.0			0.0			
Crosswalk Width(m)	1.6			1.6			1.6			1.6			
Two way Left Turn Lane													
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (k/h)	24	14		24		14		24		14		24	
Sign Control	Stop			Stop			Free			Free			
Intersection Summary													
Area Type:	Other												
Control Type:	Unsignalized												
Intersection Capacity Utilization	58.1%						ICU Level of Service B						
Analysis Period (min)	15												

HCM Unsignalized Intersection Capacity Analysis

6: Kerr Street & Prince Charles Drive

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	5	0	5	5	0	75	5	475	5	40	355	5
Future Volume (Veh/h)	5	0	5	5	0	75	5	475	5	40	355	5
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	0	5	5	0	79	5	500	5	42	374	5
Pedestrians	21			31			1			4		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	2			3			0			0		
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (m)							238			127		
pX, platoon unblocked	0.91	0.91	0.89	0.91	0.91	0.96	0.89				0.96	
vC, conflicting volume	1077	1028	398	1010	1028	538	400				536	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	926	871	262	852	871	492	263				491	
tC, single (s)	7.1	7.0	6.2	7.1	6.5	6.2	4.3				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.5	3.3	3.5	4.0	3.3	2.4				2.2	
p0 queue free %	97	100	99	98	100	85	100				96	
cM capacity (veh/h)	178	201	682	230	241	537	1050				981	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	10	84	510	421								
Volume Left	5	5	5	42								
Volume Right	5	79	5	5								
cSH	282	497	1050	981								
Volume to Capacity	0.04	0.17	0.00	0.04								
Queue Length 95th (m)	0.8	4.6	0.1	1.0								
Control Delay (s)	18.2	13.7	0.1	1.3								
Lane LOS	C	B	A	A								
Approach Delay (s)	18.2	13.7	0.1	1.3								
Approach LOS	C	B										
Intersection Summary												
Average Delay	1.9											
Intersection Capacity Utilization	58.1%			ICU Level of Service			B					
Analysis Period (min)	15											

Lanes, Volumes, Timings

7: Kerr Street & Elmwood Road

02/28/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	30	10	5	455	320	45
Future Volume (vph)	30	10	5	455	320	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.965				0.983	
Fit Protected	0.964				0.999	
Satd. Flow (prot)	1723		0		1857 1820 0	
Fit Permitted	0.964				0.999	
Satd. Flow (perm)	1723		0		1857 1820 0	
Link Speed (k/h)	40				50 50	
Link Distance (m)	171.2				103.0 134.8	
Travel Time (s)	15.4				7.4 9.7	
Confl. Peds. (#/hr)	1	2	34			34
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	10%	20%	2%	2%	7%
Adj. Flow (vph)	32	11	5	479	337	47
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	0	0	484	384	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6				0.0 0.0	
Link Offset(m)	0.0				0.0 0.0	
Crosswalk Width(m)	1.6				1.6 1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14		24 14	
Sign Control	Stop			Free		Free
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	38.6%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

7: Kerr Street & Elmwood Road

02/28/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	[Diagram]					
Traffic Volume (veh/h)	30	10	5	455	320	45
Future Volume (Veh/h)	30	10	5	455	320	45
Sign Control	Stop		Free			
Grade	0%		0%			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	32	11	5	479	337	47
Pedestrians	34		2			
Lane Width (m)	3.6		3.6			
Walking Speed (m/s)	1.1		1.1			
Percent Blockage	3		0			
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)			103		262	
pX, platoon unblocked	0.93	0.98	0.98			
vC, conflicting volume	884	396	418			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	786	373	395			
tC, single (s)	6.4	6.3	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.4			
p0 queue free %	90	98	100			
cM capacity (veh/h)	325	621	1017			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	43	484	384			
Volume Left	32	5	0			
Volume Right	11	0	47			
cSH	370	1017	1700			
Volume to Capacity	0.12	0.00	0.23			
Queue Length 95th (m)	3.0	0.1	0.0			
Control Delay (s)	16.0	0.1	0.0			
Lane LOS	C	A				
Approach Delay (s)	16.0	0.1	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			38.6%		ICU Level of Service A	
Analysis Period (min)			15			

Lanes, Volumes, Timings

8: Kerr Street & Stewart Street

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	[Diagram]											
Traffic Volume (vph)	35	25	5	15	35	70	5	355	20	40	260	30
Future Volume (vph)	35	25	5	15	35	70	5	355	20	40	260	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98		0.97		1.00		1.00		0.99		0.99	
Frt	0.990		0.921		0.993		0.988		0.994		0.988	
Flt Protected	0.974		0.994		0.999		0.994		0.994		0.994	
Satd. Flow (prot)	0	1679	0	0	1607	0	0	1845	0	0	1822	0
Flt Permitted	0.806		0.957		0.997		0.923		0.923		0.923	
Satd. Flow (perm)	0	1369	0	0	1543	0	0	1841	0	0	1689	0
Right Turn on Red			Yes		Yes		Yes		Yes		Yes	
Satd. Flow (RTOR)	5		76		4		10		50		50	
Link Speed (k/h)	40		40		50		103.0		7.4		7.4	
Link Distance (m)	95.6		60.6		165.0		103.0		7.4		7.4	
Travel Time (s)	8.6		5.5		11.9		7.4		7.4		7.4	
Confl. Peds. (#/hr)	20		15	15		20	35		25	25		35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Adj. Flow (vph)	38	27	5	16	38	76	5	386	22	43	283	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	70	0	0	130	0	0	413	0	0	359	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6		1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2			1	6
Permitted Phases		4			8			2			6	

Lanes, Volumes, Timings
8: Kerr Street & Stewart Street

02/28/2024

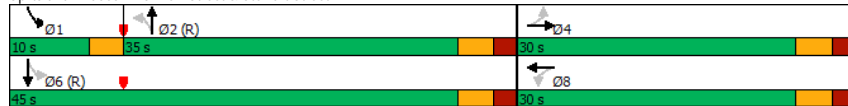


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		24.0	24.0		6.0	24.0	
Minimum Split (s)	30.0	30.0		30.0	30.0		32.0	32.0		10.0	32.0	
Total Split (s)	30.0	30.0		30.0	30.0		35.0	35.0		10.0	45.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		46.7%	46.7%		13.3%	60.0%	
Maximum Green (s)	24.6	24.6		24.6	24.6		29.6	29.6		7.0	39.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.0	3.3	
All-Red Time (s)	2.1	2.1		2.1	2.1		2.1	2.1		0.0	2.1	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.4			5.4			5.4			5.4	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
Recall Mode	None	None		None	None		C-Min	C-Min		None	C-Min	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0		
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		14.0	14.0		14.0		
Pedestrian Calls (#/hr)	20	20		20	20		35	35		35		
Act Effect Green (s)		15.2			15.2			53.2			53.2	
Actuated g/C Ratio		0.20			0.20			0.71			0.71	
v/c Ratio		0.25			0.35			0.32			0.30	
Control Delay		23.5			13.2			7.6			7.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		23.5			13.2			7.6			7.4	
LOS		C			B			A			A	
Approach Delay		23.5			13.2			7.6			7.4	
Approach LOS		C			B			A			A	

Intersection Summary

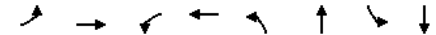
Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.35
 Intersection Signal Delay: 9.4 Intersection LOS: A
 Intersection Capacity Utilization 63.8% ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 8: Kerr Street & Stewart Street



Timings
8: Kerr Street & Stewart Street

02/28/2024

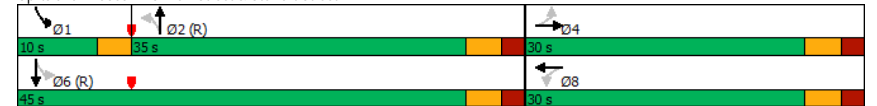


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔		↔		↔	↔		↔
Traffic Volume (vph)	35	25		15	35	5	355	40	260
Future Volume (vph)	35	25		15	35	5	355	40	260
Turn Type	Perm	NA		Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6	
Permitted Phases	4			8		2	1	6	
Detector Phase	4	4		8	8	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0		10.0	10.0	24.0	24.0	6.0	24.0
Minimum Split (s)	30.0	30.0		30.0	30.0	32.0	32.0	10.0	32.0
Total Split (s)	30.0	30.0		30.0	30.0	35.0	35.0	10.0	45.0
Total Split (%)	40.0%	40.0%		40.0%	40.0%	46.7%	46.7%	13.3%	60.0%
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	3.3	3.0	3.3
All-Red Time (s)	2.1	2.1		2.1	2.1	2.1	2.1	0.0	2.1
Lost Time Adjust (s)		0.0			0.0		0.0		0.0
Total Lost Time (s)		5.4			5.4		5.4		5.4
Lead/Lag						Lag	Lag	Lead	
Lead-Lag Optimize?						Yes	Yes	Yes	
Recall Mode	None	None		None	None	C-Min	C-Min	None	C-Min
Act Effect Green (s)		15.2			15.2		53.2		53.2
Actuated g/C Ratio		0.20			0.20		0.71		0.71
v/c Ratio		0.25			0.35		0.32		0.30
Control Delay		23.5			13.2		7.6		7.4
Queue Delay		0.0			0.0		0.0		0.0
Total Delay		23.5			13.2		7.6		7.4
LOS		C			B		A		A
Approach Delay		23.5			13.2		7.6		7.4
Approach LOS		C			B		A		A

Intersection Summary

Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.35
 Intersection Signal Delay: 9.4 Intersection LOS: A
 Intersection Capacity Utilization 63.8% ICU Level of Service B
 Analysis Period (min) 15

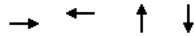
Splits and Phases: 8: Kerr Street & Stewart Street



Queues

8: Kerr Street & Stewart Street

02/28/2024



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	70	130	413	359
w/c Ratio	0.25	0.35	0.32	0.30
Control Delay	23.5	13.2	7.6	7.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.5	13.2	7.6	7.4
Queue Length 50th (m)	8.5	7.0	16.5	13.8
Queue Length 95th (m)	15.7	17.1	49.5	42.9
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)				
Base Capacity (vph)	452	557	1306	1200
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced w/c Ratio	0.15	0.23	0.32	0.30

Intersection Summary

HCM Signalized Intersection Capacity Analysis

8: Kerr Street & Stewart Street

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	35	25	5	15	35	70	5	355	20	40	260	30
Future Volume (vph)	35	25	5	15	35	70	5	355	20	40	260	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.4			5.4			5.4			5.4	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		1.00			0.97			1.00			0.99	
Flpb, ped/bikes		0.99			1.00			1.00			1.00	
Frt		0.99			0.92			0.99			0.99	
Flt Protected		0.97			0.99			1.00			0.99	
Satd. Flow (prot)		1655			1602			1845			1817	
Flt Permitted		0.81			0.96			1.00			0.92	
Satd. Flow (perm)		1370			1544			1839			1687	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	27	5	16	38	76	5	386	22	43	283	33
RTOR Reduction (vph)	0	4	0	0	63	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	66	0	0	67	0	0	412	0	0	356	0
Confl. Peds. (#/hr)	20		15	15		20	35		25	25		35
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2			1	6
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.2			13.2			51.0			51.0	
Effective Green, g (s)		13.2			13.2			51.0			51.0	
Actuated g/C Ratio		0.18			0.18			0.68			0.68	
Clearance Time (s)		5.4			5.4			5.4			5.4	
Vehicle Extension (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		241			271			1250			1147	
v/s Ratio Prot												
v/s Ratio Perm		c0.05			0.04			c0.22			0.21	
v/c Ratio		0.27			0.25			0.33			0.31	
Uniform Delay, d1		26.7			26.6			4.9			4.9	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.8			0.7			0.7			0.2	
Delay (s)		27.6			27.3			5.7			5.0	
Level of Service		C			C			A			A	
Approach Delay (s)		27.6			27.3			5.7			5.0	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	13.8
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

9: Speers Internal Road 1 & Speers Road

02/28/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕	↕	↕
Traffic Volume (vph)	1310	5	0	785	5	0
Future Volume (vph)	1310	5	0	785	5	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt	0.999					
Flt Protected				0.950		
Satd. Flow (prot)	3606	0	0	3610	1805	0
Flt Permitted	0.950					
Satd. Flow (perm)	3606	0	0	3610	1805	0
Link Speed (k/h)	60		60		20	
Link Distance (m)	147.2		113.4		44.5	
Travel Time (s)	8.8		6.8		8.0	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1337	5	0	801	5	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1342	0	0	801	5	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	14		24		24	
Sign Control	Free		Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	46.4%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

9: Speers Internal Road 1 & Speers Road

02/28/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕	↕	↕
Traffic Volume (veh/h)	1310	5	0	785	5	0
Future Volume (Veh/h)	1310	5	0	785	5	0
Sign Control	Free			Stop		
Grade	0%					
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	1337	5	0	801	5	0
Pedestrians	1			1		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	147			347		
pX, platoon unblocked				0.86	0.87	0.86
vC, conflicting volume				1342	1741	672
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				1070	1422	290
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				100	96	100
cM capacity (veh/h)				566	113	611

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	891	451	267	534	5
Volume Left	0	0	0	0	5
Volume Right	0	5	0	0	0
cSH	1700	1700	566	1700	113
Volume to Capacity	0.52	0.27	0.00	0.31	0.04
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.0
Control Delay (s)	0.0	0.0	0.0	0.0	38.4
Lane LOS	E				
Approach Delay (s)	0.0		0.0		38.4
Approach LOS	E				

Intersection Summary

Average Delay	0.1				
Intersection Capacity Utilization	46.4%		ICU Level of Service		A
Analysis Period (min)	15				

Lanes, Volumes, Timings

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/28/2024

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	5	0	0	5	0
Future Volume (vph)	0	5	0	0	5	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected						0.950
Satd. Flow (prot)	1644	0	1900	0	0	1805
Flt Permitted						0.950
Satd. Flow (perm)	1644	0	1900	0	0	1805
Link Speed (k/h)	20					
Link Distance (m)	35.0		49.5		44.5	
Travel Time (s)	6.3		8.9		8.0	
Confl. Peds. (#/hr)	8					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%					
Adj. Flow (vph)	0	6	0	0	6	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	0	0	0	0	6
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6					
Link Offset(m)	0.0					
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	14		24	
Sign Control	Stop		Free		Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	15.7% ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/28/2024

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	5	0	0	5	0
Future Volume (Veh/h)	0	5	0	0	5	0
Sign Control	Stop		Free		Free	
Grade	0%					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	6	0	0	6	0
Pedestrians	2					
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0					1
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	14	8	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	14	8	0			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	1005	1072	1636			

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	6	0	6
Volume Left	0	0	6
Volume Right	6	0	0
cSH	1072	1700	1636
Volume to Capacity	0.01	0.00	0.00
Queue Length 95th (m)	0.1	0.0	0.1
Control Delay (s)	8.4	0.0	7.2
Lane LOS	A	A	A
Approach Delay (s)	8.4	0.0	7.2
Approach LOS	A		

Intersection Summary			
Average Delay	7.8		
Intersection Capacity Utilization	15.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings

11: PUDO + Parking & Speers Internal Road

02/28/2024



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	5	0	0	5	0	5
Future Volume (vph)	5	0	0	5	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected						
Satd. Flow (prot)	1900	0	0	1900	1644	0
Flt Permitted						
Satd. Flow (perm)	1900	0	0	1900	1644	0
Link Speed (k/h)	20		20		20	
Link Distance (m)	35.0		37.7		75.1	
Travel Time (s)	6.3		6.8		13.5	
Confl. Peds. (#/hr)			13			
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	6	0	0	6	0	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	0	0	6	6	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0		0.0		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	14		24		24	
Sign Control	Free		Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	13.3%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

11: PUDO + Parking & Speers Internal Road

02/28/2024



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Volume (veh/h)	5	0	0	5	0	5
Future Volume (Veh/h)	5	0	0	5	0	5
Sign Control	Free			Free	Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	6	0	0	6	0	6
Pedestrians	13		2			
Lane Width (m)	3.6		3.6			
Walking Speed (m/s)	1.1		1.1			
Percent Blockage	1		0			
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			6		25	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			6		25	
tC, single (s)			4.1		6.4	
tC, 2 stage (s)						
tF (s)			2.2		3.5	
p0 queue free %			100		100	
cM capacity (veh/h)			1628		984	

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	6	6	6
Volume Left	0	0	0
Volume Right	0	0	6
cSH	1700	1628	1078
Volume to Capacity	0.00	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.1
Control Delay (s)	0.0	0.0	8.4
Lane LOS	A		
Approach Delay (s)	0.0	0.0	8.4
Approach LOS	A		

Intersection Summary

Average Delay	2.8		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings

12: Underground & Speers Internal Road

02/28/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (vph)	10	0	0	0	5	5
Future Volume (vph)	10	0	0	0	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt					0.932	
Flt Protected					0.976	
Satd. Flow (prot)	1900	0	0	1900	1728	0
Flt Permitted					0.976	
Satd. Flow (perm)	1900	0	0	1900	1728	0
Link Speed (k/h)	20			20	20	
Link Distance (m)	37.7			38.9	38.9	
Travel Time (s)	6.8			7.0	7.0	
Confl. Peds. (#/hr)					10	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	13	0	0	0	6	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	0	0	0	12	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	13.3%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

12: Underground & Speers Internal Road

02/28/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (veh/h)	10	0	0	0	5	5
Future Volume (Veh/h)	10	0	0	0	5	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	13	0	0	0	6	6
Pedestrians	10			3		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	1			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			13		23	16
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			13		23	16
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1619		989	1066
Direction, Lane #						
	EB 1	WB 1	NB 1			
Volume Total	13	0	12			
Volume Left	0	0	6			
Volume Right	0	0	6			
cSH	1700	1700	1026			
Volume to Capacity	0.01	0.00	0.01			
Queue Length 95th (m)	0.0	0.0	0.3			
Control Delay (s)	0.0	0.0	8.5			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	8.5			
Approach LOS	A					
Intersection Summary						
Average Delay	4.1					
Intersection Capacity Utilization	13.3%		ICU Level of Service		A	
Analysis Period (min)	15					

Lanes, Volumes, Timings

13: PUDO Exit/Speers Internal Road 2 & Speers Internal Road/30 Speers

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↔	
Traffic Volume (vph)	15	0	0	0	0	20	0	5	0	5	0	0
Future Volume (vph)	15	0	0	0	0	20	0	5	0	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.865											
Frt	0.950											
Fit Protected	0.950											
Satd. Flow (prot)	0	1504	0	0	1644	0	0	1900	0	0	1805	0
Fit Permitted	0.950											
Satd. Flow (perm)	0	1504	0	0	1644	0	0	1900	0	0	1805	0
Link Speed (k/h)	20											
Link Distance (m)	38.9			43.4			75.5			49.2		
Travel Time (s)	7.0			7.8			13.6			8.9		
Confl. Peds. (#/hr)	2		8	8		2		7	7			
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Heavy Vehicles (%)	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%
Adj. Flow (vph)	24	0	0	0	0	32	0	8	0	8	0	0
Shared Lane Traffic (%)	0											
Lane Group Flow (vph)	0	24	0	0	32	0	0	8	0	0	8	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0											
Link Offset(m)	0.0											
Crosswalk Width(m)	1.6			1.6			1.6			1.6		
Two way Left Turn Lane	No											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control	Stop				Stop				Free		Free	

Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	20.9%			ICU Level of Service A								
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

13: PUDO Exit/Speers Internal Road 2 & Speers Internal Road/30 Speers

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↔	
Traffic Volume (veh/h)	15	0	0	0	0	20	0	5	0	5	0	0
Future Volume (Veh/h)	15	0	0	0	0	20	0	5	0	5	0	0
Sign Control	Stop				Stop				Free		Free	
Grade	0%											
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Hourly flow rate (vph)	24	0	0	0	0	32	0	8	0	8	0	0
Pedestrians	3											
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	0											
Right turn flare (veh)	0											
Median type							None			None		
Median storage (veh)	0											
Upstream signal (m)	0											
pX, platoon unblocked	0											
vC, conflicting volume	62	34	11	39	34	18	3			15		
vC1, stage 1 conf vol	0											
vC2, stage 2 conf vol	0											
vCu, unblocked vol	62	34	11	39	34	18	3			15		
tC, single (s)	7.3	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	0											
tF (s)	3.7	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	100	100	100	97	100			100		
cM capacity (veh/h)	849	850	1065	947	850	1057	1628			1606		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	24	32	8	8
Volume Left	24	0	0	8
Volume Right	0	32	0	0
cSH	849	1057	1628	1606
Volume to Capacity	0.03	0.03	0.00	0.00
Queue Length 95th (m)	0.7	0.7	0.0	0.1
Control Delay (s)	9.4	8.5	0.0	7.3
Lane LOS	A	A		A
Approach Delay (s)	9.4	8.5	0.0	7.3
Approach LOS	A	A		

Intersection Summary			
Average Delay	7.7		
Intersection Capacity Utilization	20.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (vph)	0	1310	0	5	775	0	10	0	30	0	0	0
Future Volume (vph)	0	1310	0	5	775	0	10	0	30	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.900											
Flt Protected	0.987											
Satd. Flow (prot)	0	3539	0	0	3540	0	0	1688	0	0	1863	0
Flt Permitted	0.987											
Satd. Flow (perm)	0	3539	0	0	3540	0	0	1688	0	0	1863	0
Link Speed (k/h)	60											
Link Distance (m)	113.4			233.1			49.2			39.0		
Travel Time (s)	6.8			14.0			8.9			7.0		
Confl. Peds. (#/hr)	8			8								
Confl. Bikes (#/hr)	1											
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	2%	0%	2%	2%	2%
Adj. Flow (vph)	0	1379	0	5	816	0	11	0	32	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1379	0	0	821	0	0	43	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.6			3.6			0.0					
Link Offset(m)	0.0											
Crosswalk Width(m)	1.6			1.6			1.6					
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14		24		14		24		14	
Sign Control	Free			Free			Stop			Stop		

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	46.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (veh/h)	0	1310	0	5	775	0	10	0	30	0	0	0
Future Volume (Veh/h)	0	1310	0	5	775	0	10	0	30	0	0	0
Sign Control	Free			Free			Stop			Stop		
Grade	0%											
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Hourly flow rate (vph)	0	1379	0	5	816	0	11	0	32	0	0	0
Pedestrians	4			4			8					
Lane Width (m)	3.6			3.6			3.6					
Walking Speed (m/s)	1.1			1.1			1.1					
Percent Blockage	0			0			1					
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)	261			233								
pX, platoon unblocked	0.96			0.87			0.89			0.89		
vC, conflicting volume	816			1387			1809			2213		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	717			1145			1444			1898		
tC, single (s)	4.1			4.1			7.5			6.5		
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5			4.0		
p0 queue free %	100			99			87			100		
cM capacity (veh/h)	842			533			82			60		
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	919	460	277	544	43	0						
Volume Left	0	0	5	0	11	0						
Volume Right	0	0	0	0	32	0						
cSH	1700	1700	533	1700	225	1700						
Volume to Capacity	0.54	0.27	0.01	0.32	0.19	0.00						
Queue Length 95th (m)	0.0	0.0	0.2	0.0	5.2	0.0						
Control Delay (s)	0.0	0.0	0.3	0.0	24.8	0.0						
Lane LOS	A			C			A					
Approach Delay (s)	0.0			0.1			24.8			0.0		
Approach LOS	C			A								
Intersection Summary												
Average Delay	0.5											
Intersection Capacity Utilization	46.2%			ICU Level of Service			A					
Analysis Period (min)	15											

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	60	525	120	285	750	490	140	140	220	270	235	60
Future Volume (vph)	60	525	120	285	750	490	140	140	220	270	235	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	105.0		0.0	75.0		100.0	50.0		45.0	0.0		0.0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99		1.00		0.94	0.97		0.93	0.96	0.99	
Frt		0.972				0.850			0.850		0.970	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3431	0	1752	3539	1583	1787	1900	1599	1787	1816	0
Flt Permitted	0.319			0.292			0.362			0.510		
Satd. Flow (perm)	600	3431	0	536	3539	1485	659	1900	1486	918	1816	0
Right Turn on Red			Yes			Yes		Yes				Yes
Satd. Flow (RTOR)		27				516			232		11	
Link Speed (kh)		60			60			50			50	
Link Distance (m)		235.8			147.2			127.4			167.2	
Travel Time (s)		14.1			8.8			9.2			12.0	
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	3%	2%	1%	0%	1%	1%	1%	0%	0%
Adj. Flow (vph)	63	553	126	300	789	516	147	147	232	284	247	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	63	679	0	300	789	516	147	147	232	284	310	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2		2	4		4	8		
Detector Phase	1	6		5	2	2	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	7.0	25.0		7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0	
Minimum Split (s)	10.0	30.9		10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3	
Total Split (s)	12.0	54.0		12.0	54.0	54.0	12.0	38.0	38.0	16.0	42.0	
Total Split (%)	10.0%	45.0%		10.0%	45.0%	45.0%	10.0%	31.7%	31.7%	13.3%	35.0%	
Maximum Green (s)	9.0	48.1		9.0	48.1	48.1	9.0	31.7	31.7	13.0	35.7	
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	
All-Red Time (s)	0.0	2.2		0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	5.5		2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	
Walk Time (s)		7.0			7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		14.0			14.0	14.0		14.0	14.0		14.0	
Pedestrian Calls (#/hr)		15			15	15		35	35		35	
Act Effect Green (s)	62.0	51.6		70.8	59.6	59.6	34.5	20.9	20.9	43.0	26.4	
Actuated g/C Ratio	0.52	0.43		0.59	0.50	0.50	0.29	0.17	0.17	0.36	0.22	
v/c Ratio	0.16	0.46		0.66	0.45	0.52	0.51	0.45	0.52	0.64	0.76	
Control Delay	13.5	25.6		22.6	22.4	3.9	32.9	47.1	9.1	35.9	54.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	13.5	25.6		22.6	22.4	3.9	32.9	47.1	9.1	35.9	54.0	
LOS	B	C		C	C	A	C	D	A	D	D	
Approach Delay		24.6			16.5			26.4			45.4	
Approach LOS		C			B			C			D	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 49 (41%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 24.7

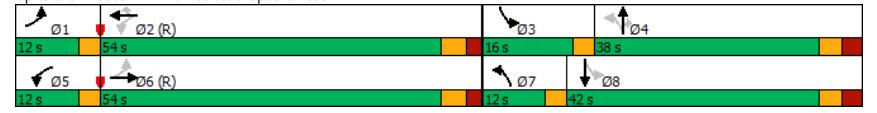
Intersection LOS: C

Intersection Capacity Utilization 83.1%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 1: Kerr Street & Speers Road



Timings
1: Kerr Street & Speers Road

02/28/2024

	↖	→	↙	←	↘	↖	↙	↘	↖	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	60	525	285	750	490	140	140	220	270	235
Future Volume (vph)	60	525	285	750	490	140	140	220	270	235
Turn Type	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	1	6	5	2		7	4		3	8
Permitted Phases	6		2		2	4		4	8	
Detector Phase	1	6	5	2	2	7	4	4	3	8
Switch Phase										
Minimum Initial (s)	7.0	25.0	7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0
Minimum Split (s)	10.0	30.9	10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3
Total Split (s)	12.0	54.0	12.0	54.0	54.0	12.0	38.0	38.0	16.0	42.0
Total Split (%)	10.0%	45.0%	10.0%	45.0%	45.0%	10.0%	31.7%	31.7%	13.3%	35.0%
Yellow Time (s)	3.0	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3
All-Red Time (s)	0.0	2.2	0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	None	C-Min	C-Min	None	None	None	None	None
Act Effect Green (s)	62.0	51.6	70.8	59.6	59.6	34.5	20.9	20.9	43.0	26.4
Actuated g/C Ratio	0.52	0.43	0.59	0.50	0.50	0.29	0.17	0.17	0.36	0.22
v/c Ratio	0.16	0.46	0.66	0.45	0.52	0.51	0.45	0.52	0.64	0.76
Control Delay	13.5	25.6	22.6	22.4	3.9	32.9	47.1	9.1	35.9	54.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	25.6	22.6	22.4	3.9	32.9	47.1	9.1	35.9	54.0
LOS	B	C	C	C	A	C	D	A	D	D
Approach Delay		24.6		16.5			26.4			45.4
Approach LOS		C		B			C			D

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 49 (41%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.76
 Intersection Signal Delay: 24.7 Intersection LOS: C
 Intersection Capacity Utilization 83.1% ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 1: Kerr Street & Speers Road



Queues
1: Kerr Street & Speers Road

02/28/2024

	↖	→	↙	←	↘	↖	↙	↘	↖	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	63	679	300	789	516	147	147	232	284	310
v/c Ratio	0.16	0.46	0.66	0.45	0.52	0.51	0.45	0.52	0.64	0.76
Control Delay	13.5	25.6	22.6	22.4	3.9	32.9	47.1	9.1	35.9	54.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	25.6	22.6	22.4	3.9	32.9	47.1	9.1	35.9	54.0
Queue Length 50th (m)	6.4	62.0	35.3	66.5	0.0	23.0	31.3	0.0	48.4	65.2
Queue Length 95th (m)	13.6	76.4	#59.6	90.5	20.4	36.2	46.5	19.2	68.8	90.5
Internal Link Dist (m)		211.8		123.2		103.4			143.2	
Turn Bay Length (m)	105.0		75.0		100.0	50.0		45.0		
Base Capacity (vph)	407	1526	453	1758	997	288	501	563	443	547
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.44	0.66	0.45	0.52	0.51	0.29	0.41	0.64	0.57

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Kerr Street & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	60	525	120	285	750	490	140	140	220	270	235	60
Future Volume (vph)	60	525	120	285	750	490	140	140	220	270	235	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frb, ped/bikes	1.00	0.99		1.00	1.00	0.94	1.00	1.00	0.93	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	0.98	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1797	3431		1751	3539	1485	1768	1900	1486	1750	1816	
Flt Permitted	0.32	1.00		0.29	1.00	1.00	0.36	1.00	1.00	0.51	1.00	
Satd. Flow (perm)	603	3431		539	3539	1485	674	1900	1486	940	1816	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	553	126	300	789	516	147	147	232	284	247	63
RTOR Reduction (vph)	0	15	0	0	0	262	0	0	192	0	9	0
Lane Group Flow (vph)	63	664	0	300	789	254	147	147	40	284	301	0
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2			4			4	8	
Actuated Green, G (s)	57.7	51.6		68.1	59.0	59.0	31.2	20.9	20.9	39.7	26.4	
Effective Green, g (s)	57.7	51.6		68.1	59.0	59.0	31.2	20.9	20.9	39.7	26.4	
Actuated g/C Ratio	0.48	0.43		0.57	0.49	0.49	0.26	0.17	0.17	0.33	0.22	
Clearance Time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Vehicle Extension (s)	2.5	5.5		2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	
Lane Grp Cap (vph)	350	1475		442	1740	730	269	330	258	417	399	
v/s Ratio Prot	0.01	0.19		c0.08	0.22		0.05	0.08		c0.09	c0.17	
v/s Ratio Perm	0.08			c0.31			0.17	0.10		0.03	0.14	
v/c Ratio	0.18	0.45		0.68	0.45	0.35	0.55	0.45	0.16	0.68	0.76	
Uniform Delay, d1	16.9	24.2		14.9	20.0	18.7	36.1	44.4	42.1	32.2	43.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	1.0		3.7	0.9	1.3	1.8	1.3	0.4	4.2	8.4	
Delay (s)	17.1	25.2		18.7	20.8	20.0	37.9	45.7	42.5	36.4	52.2	
Level of Service	B	C		B	C	C	D	D	D	D	D	
Approach Delay (s)		24.5			20.2			42.1			44.6	
Approach LOS		C			C			D			D	

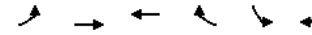
Intersection Summary			
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

2: Speers Road & Cross Avenue

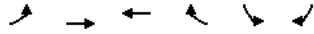
02/28/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	225	775	1140	15	10	385
Future Volume (vph)	225	775	1140	15	10	385
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	80.0			0.0	45.0	0.0
Storage Lanes	1			0	1	2
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	0.88
Ped Bike Factor	1.00		1.00			
Frt			0.998			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1703	3610	3566	0	1805	2733
Flt Permitted	0.183				0.950	
Satd. Flow (perm)	328	3610	3566	0	1805	2733
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			2			333
Link Speed (k/h)		60	60		48	
Link Distance (m)		233.1	101.5		84.0	
Travel Time (s)		14.0	6.1		6.3	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Adj. Flow (vph)	234	807	1188	16	10	401
Shared Lane Traffic (%)						
Lane Group Flow (vph)	234	807	1204	0	10	401
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
2: Speers Road & Cross Avenue

02/28/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	pm+pt	NA	NA	Prot	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Detector Phase	5	2	6		4	4
Switch Phase						
Minimum Initial (s)	6.0	38.0	38.0		10.0	10.0
Minimum Split (s)	12.0	47.6	47.6		15.8	15.8
Total Split (s)	17.0	102.0	85.0		38.0	38.0
Total Split (%)	12.1%	72.9%	60.7%		27.1%	27.1%
Maximum Green (s)	11.0	95.4	78.4		32.2	32.2
Yellow Time (s)	4.0	3.7	3.7		3.3	3.3
All-Red Time (s)	2.0	2.9	2.9		2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6		5.8	5.8
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Recall Mode	None	C-Min	C-Min		None	None
Walk Time (s)		10.0	10.0			
Flash Dont Walk (s)		31.0	31.0			
Pedestrian Calls (#/hr)		5	5			
Act Effect Green (s)	116.3	115.7	97.6		11.9	11.9
Actuated g/C Ratio	0.83	0.83	0.70		0.08	0.08
v/c Ratio	0.60	0.27	0.48		0.07	0.75
Control Delay	9.4	3.1	11.2		58.0	21.2
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	9.4	3.1	11.2		58.0	21.2
LOS	A	A	B		E	C
Approach Delay		4.5	11.2		22.1	
Approach LOS		A	B		C	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 13 (9%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.75
 Intersection Signal Delay: 10.3 Intersection LOS: B
 Intersection Capacity Utilization 70.3% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: Speers Road & Cross Avenue



Timings
2: Speers Road & Cross Avenue

02/28/2024

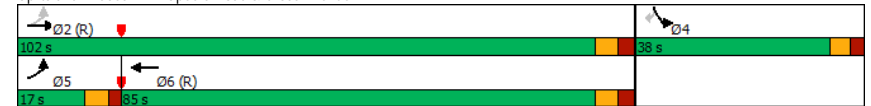


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↕↕	↕↕	↔	↕↕
Traffic Volume (vph)	225	775	1140	10	385
Future Volume (vph)	225	775	1140	10	385
Turn Type	pm+pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2				4
Detector Phase	5	2	6	4	4
Switch Phase					
Minimum Initial (s)	6.0	38.0	38.0	10.0	10.0
Minimum Split (s)	12.0	47.6	47.6	15.8	15.8
Total Split (s)	17.0	102.0	85.0	38.0	38.0
Total Split (%)	12.1%	72.9%	60.7%	27.1%	27.1%
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	None	None
Act Effect Green (s)	116.3	115.7	97.6	11.9	11.9
Actuated g/C Ratio	0.83	0.83	0.70	0.08	0.08
v/c Ratio	0.60	0.27	0.48	0.07	0.75
Control Delay	9.4	3.1	11.2	58.0	21.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.4	3.1	11.2	58.0	21.2
LOS	A	A	B	E	C
Approach Delay		4.5	11.2	22.1	
Approach LOS		A	B	C	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 13 (9%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.75
 Intersection Signal Delay: 10.3 Intersection LOS: B
 Intersection Capacity Utilization 70.3% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: Speers Road & Cross Avenue



Queues
2: Speers Road & Cross Avenue

02/28/2024

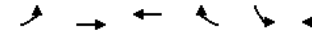


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	234	807	1204	10	401
w/c Ratio	0.60	0.27	0.48	0.07	0.75
Control Delay	9.4	3.1	11.2	58.0	21.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.4	3.1	11.2	58.0	21.2
Queue Length 50th (m)	9.1	18.9	66.3	2.7	10.3
Queue Length 95th (m)	19.5	33.0	113.8	8.1	27.7
Internal Link Dist (m)		209.1	77.5	60.0	
Turn Bay Length (m)	80.0		45.0		
Base Capacity (vph)	398	2983	2486	415	885
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.59	0.27	0.48	0.02	0.45

Intersection Summary

HCM Signalized Intersection Capacity Analysis
2: Speers Road & Cross Avenue

02/28/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↕	↕		↘	↕
Traffic Volume (vph)	225	775	1140	15	10	385
Future Volume (vph)	225	775	1140	15	10	385
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.6	6.6		5.8	5.8
Lane Util. Factor	1.00	0.95	0.95		1.00	0.88
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1703	3610	3566		1805	2733
Flt Permitted	0.18	1.00	1.00		0.95	1.00
Satd. Flow (perm)	328	3610	3566		1805	2733
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	234	807	1188	16	10	401
RTOR Reduction (vph)	0	0	1	0	0	305
Lane Group Flow (vph)	234	807	1203	0	10	96
Confl. Peds. (#/hr)	5			5		
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	115.7	115.7	97.6		11.9	11.9
Effective Green, g (s)	115.7	115.7	97.6		11.9	11.9
Actuated g/C Ratio	0.83	0.83	0.70		0.09	0.09
Clearance Time (s)	6.0	6.6	6.6		5.8	5.8
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Lane Grp Cap (vph)	389	2983	2486		153	232
v/s Ratio Prot	c0.05	0.22	0.34		0.01	
v/s Ratio Perm	c0.44					c0.04
w/c Ratio	0.60	0.27	0.48		0.07	0.42
Uniform Delay, d1	6.5	2.7	9.7		58.9	60.7
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.8	0.2	0.7		0.2	1.2
Delay (s)	9.3	2.9	10.4		59.1	62.0
Level of Service	A	A	B		E	E
Approach Delay (s)		4.4	10.4		61.9	
Approach LOS		A	B		E	

Intersection Summary

HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

3: St. Augustine Drive & Speers Road

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕			↕				↕		↕	
Traffic Volume (vph)	10	675	25	0	925	25	5	0	25	5	0	0
Future Volume (vph)	10	675	25	0	925	25	5	0	25	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		1	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995			0.996				0.865			
Flt Protected	0.950						0.950				0.950	
Satd. Flow (prot)	1805	3553	0	0	3561	0	0	0	1644	0	1805	0
Flt Permitted	0.950						0.950				0.950	
Satd. Flow (perm)	1805	3553	0	0	3561	0	0	0	1644	0	1805	0
Link Speed (k/h)		60			60				40			30
Link Distance (m)		248.1			235.8				188.1			117.6
Travel Time (s)		14.9			14.1				16.9			14.1
Confl. Peds. (#/hr)	8		5	5		8	1		1	1		1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	10	703	26	0	964	26	5	0	26	5	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	729	0	0	990	0	0	5	26	0	5	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6				0.0			0.0
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		1.6			1.6				1.6			1.6
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free				Stop			Stop

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

3: St. Augustine Drive & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕			↕				↕		↕	
Traffic Volume (veh/h)	10	675	25	0	925	25	5	0	25	5	0	0
Future Volume (Veh/h)	10	675	25	0	925	25	5	0	25	5	0	0
Sign Control		Free			Free				Stop			Stop
Grade		0%			0%				0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	10	703	26	0	964	26	5	0	26	5	0	0
Pedestrians		1			1				5			8
Lane Width (m)		3.6			3.6				3.6			3.6
Walking Speed (m/s)		1.1			1.1				1.1			1.1
Percent Blockage		0			0				0			1
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)					236							
pX, platoon unblocked	0.86						0.86	0.86		0.86	0.86	0.86
vC, conflicting volume	998				734		1224	1739	370	1384	1739	504
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	662				734		926	1527	370	1112	1527	85
tC, single (s)	4.1				4.1		7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2				2.2		3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99				100		97	100	96	96	100	100
cM capacity (veh/h)	796				876		190	99	629	133	99	819

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	10	469	260	643	347	31	5
Volume Left	10	0	0	0	0	5	5
Volume Right	0	0	26	0	26	26	0
cSH	796	1700	1700	1700	1700	458	133
Volume to Capacity	0.01	0.28	0.15	0.38	0.20	0.07	0.04
Queue Length 95th (m)	0.3	0.0	0.0	0.0	0.0	1.6	0.9
Control Delay (s)	9.6	0.0	0.0	0.0	0.0	13.4	33.2
Lane LOS	A					B	D
Approach Delay (s)	0.1			0.0		13.4	33.2
Approach LOS						B	D

Intersection Summary	
Average Delay	0.4
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min)	15

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

02/28/2024

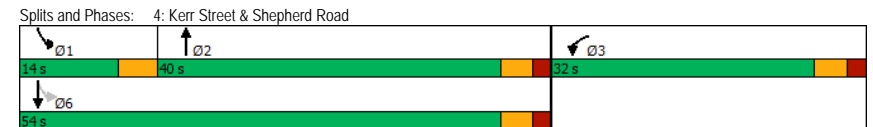
	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙		↖			↘
Traffic Volume (vph)	90	140	575	115	155	475
Future Volume (vph)	90	140	575	115	155	475
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor	0.98		1.00			1.00
Frt	0.918		0.975			
Flt Protected	0.981					0.988
Satd. Flow (prot)	1663	0	3463	0	0	3540
Flt Permitted	0.981					0.660
Satd. Flow (perm)	1654	0	3463	0	0	2364
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	94		33			
Link Speed (kh)	50		50			50
Link Distance (m)	265.3		167.2			26.5
Travel Time (s)	19.1		12.0			1.9
Confl. Peds. (#/hr)	13	6		4	4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	1%	1%	2%	0%	1%
Adj. Flow (vph)	93	144	593	119	160	490
Shared Lane Traffic (%)						
Lane Group Flow (vph)	237	0	712	0	0	650
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1		2		1	2
Detector Template	Left		Thru		Left	Thru
Leading Detector (m)	2.0		10.0		2.0	10.0
Trailing Detector (m)	0.0		0.0		0.0	0.0
Detector 1 Position(m)	0.0		0.0		0.0	0.0
Detector 1 Size(m)	2.0		0.6		2.0	0.6
Detector 1 Type	CI+Ex		CI+Ex		CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0		0.0	0.0
Detector 1 Queue (s)	0.0		0.0		0.0	0.0
Detector 1 Delay (s)	0.0		0.0		0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			CI+Ex			CI+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases						6

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

02/28/2024

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	3		2		1	6
Switch Phase						
Minimum Initial (s)	10.0		18.0		7.0	18.0
Minimum Split (s)	31.4		28.2		11.0	28.2
Total Split (s)	32.0		40.0		14.0	54.0
Total Split (%)	37.2%		46.5%		16.3%	62.8%
Maximum Green (s)	26.6		34.8		10.0	48.8
Yellow Time (s)	3.3		3.3		4.0	3.3
All-Red Time (s)	2.1		1.9		0.0	1.9
Lost Time Adjust (s)	0.0		0.0			0.0
Total Lost Time (s)	5.4		5.2			5.2
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.5		2.5	3.5
Recall Mode	None		Min		None	Min
Walk Time (s)	10.0		10.0			10.0
Flash Dont Walk (s)	16.0		13.0			13.0
Pedestrian Calls (#/hr)	0		5			5
Act Effect Green (s)	11.4		21.3			21.3
Actuated g/C Ratio	0.26		0.49			0.49
v/c Ratio	0.47		0.42			0.56
Control Delay	12.7		7.6			10.1
Queue Delay	0.0		0.0			0.0
Total Delay	12.7		7.6			10.1
LOS	B		A			B
Approach Delay	12.7		7.6			10.1
Approach LOS	B		A			B

Intersection Summary	
Area Type:	Other
Cycle Length:	86
Actuated Cycle Length:	43.5
Natural Cycle:	75
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.56
Intersection Signal Delay:	9.4
Intersection Capacity Utilization:	65.8%
Intersection LOS:	A
ICU Level of Service:	C
Analysis Period (min):	15



Timings
4: Kerr Street & Shepherd Road

02/28/2024

	↙	↑	↘	↓
Lane Group	WBL	NBT	SBL	SBT
Lane Configurations	↘ ↙	↑	↘ ↙	↘ ↙
Traffic Volume (vph)	90	575	155	475
Future Volume (vph)	90	575	155	475
Turn Type	Prot	NA	pm+pt	NA
Protected Phases	3	2	1	6
Permitted Phases	6			
Detector Phase	3	2	1	6
Switch Phase				
Minimum Initial (s)	10.0	18.0	7.0	18.0
Minimum Split (s)	31.4	28.2	11.0	28.2
Total Split (s)	32.0	40.0	14.0	54.0
Total Split (%)	37.2%	46.5%	16.3%	62.8%
Yellow Time (s)	3.3	3.3	4.0	3.3
All-Red Time (s)	2.1	1.9	0.0	1.9
Lost Time Adjust (s)	0.0	0.0		0.0
Total Lost Time (s)	5.4	5.2		5.2
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	None	Min	None	Min
Act Effct Green (s)	11.4	21.3		21.3
Actuated g/C Ratio	0.26	0.49		0.49
v/c Ratio	0.47	0.42		0.56
Control Delay	12.7	7.6		10.1
Queue Delay	0.0	0.0		0.0
Total Delay	12.7	7.6		10.1
LOS	B	A		B
Approach Delay	12.7	7.6		10.1
Approach LOS	B	A		B

Intersection Summary

Cycle Length: 86	
Actuated Cycle Length: 43.5	
Natural Cycle: 75	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 9.4	Intersection LOS: A
Intersection Capacity Utilization 65.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 4: Kerr Street & Shepherd Road



Queues
4: Kerr Street & Shepherd Road

02/28/2024

	↙	↑	↓
Lane Group	WBL	NBT	SBT
Lane Group Flow (vph)	237	712	650
v/c Ratio	0.47	0.42	0.56
Control Delay	12.7	7.6	10.1
Queue Delay	0.0	0.0	0.0
Total Delay	12.7	7.6	10.1
Queue Length 50th (m)	7.6	13.6	14.6
Queue Length 95th (m)	27.7	28.5	32.1
Internal Link Dist (m)	241.3	143.2	2.5
Turn Bay Length (m)			
Base Capacity (vph)	1076	2841	2296
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.22	0.25	0.28

Intersection Summary

--

HCM Signalized Intersection Capacity Analysis

4: Kerr Street & Shepherd Road

02/28/2024



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↕	↕	↔	↔
Traffic Volume (vph)	90	140	575	115	155	475
Future Volume (vph)	90	140	575	115	155	475
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4		5.2			5.2
Lane Util. Factor	1.00		0.95			0.95
Frb, ped/bikes	0.99		1.00			1.00
Flpb, ped/bikes	1.00		1.00			1.00
Frt	0.92		0.97			1.00
Flt Protected	0.98		1.00			0.99
Satd. Flow (prot)	1665		3465			3538
Flt Permitted	0.98		1.00			0.66
Satd. Flow (perm)	1665		3465			2364
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	93	144	593	119	160	490
RTOR Reduction (vph)	69	0	17	0	0	0
Lane Group Flow (vph)	168	0	695	0	0	650
Confl. Peds. (#/hr)	13	6		4	4	
Heavy Vehicles (%)	3%	1%	1%	2%	0%	1%
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases					6	
Actuated Green, G (s)	11.4		21.2			21.2
Effective Green, g (s)	11.4		21.2			21.2
Actuated g/C Ratio	0.26		0.49			0.49
Clearance Time (s)	5.4		5.2			5.2
Vehicle Extension (s)	3.0		3.5			3.5
Lane Grp Cap (vph)	439		1700			1160
v/s Ratio Prot	c0.10		0.20			
v/s Ratio Perm						c0.27
v/c Ratio	0.38		0.41			0.56
Uniform Delay, d1	13.0		7.0			7.7
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	0.6		0.2			0.7
Delay (s)	13.6		7.2			8.4
Level of Service	B		A			A
Approach Delay (s)	13.6		7.2			8.4
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	43.2	Sum of lost time (s)	14.6
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

5: Kerr Street & Wycroft Road

02/28/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↕	↕	↕	↕
Traffic Volume (vph)	25	120	100	615	510	110
Future Volume (vph)	25	120	100	615	510	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	75.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.889				0.976	
Flt Protected	0.991		0.950			
Satd. Flow (prot)	1620	0	1703	1900	1841	0
Flt Permitted	0.991		0.950			
Satd. Flow (perm)	1620	0	1703	1900	1841	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	561.6			442.6	98.1	
Travel Time (s)	40.4			31.9	7.1	
Confl. Peds. (#/hr)			5			5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	4%	6%	0%	0%	4%
Adj. Flow (vph)	27	128	106	654	543	117
Shared Lane Traffic (%)						
Lane Group Flow (vph)	155	0	106	654	660	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	57.9%
ICU Level of Service	B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

5: Kerr Street & Wynecroft Road

02/28/2024

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔		↔	
Traffic Volume (veh/h)	25	120	100	615	510	110
Future Volume (Veh/h)	25	120	100	615	510	110
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	27	128	106	654	543	117
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1472	606	665			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1472	606	665			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	78	74	88			
cM capacity (veh/h)	124	491	901			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	155	106	654	660		
Volume Left	27	106	0	0		
Volume Right	128	0	0	117		
cSH	324	901	1700	1700		
Volume to Capacity	0.48	0.12	0.38	0.39		
Queue Length 95th (m)	18.7	3.0	0.0	0.0		
Control Delay (s)	25.9	9.5	0.0	0.0		
Lane LOS	D	A				
Approach Delay (s)	25.9	1.3	0.0			
Approach LOS	D					
Intersection Summary						
Average Delay			3.2			
Intersection Capacity Utilization			57.9%		ICU Level of Service B	
Analysis Period (min)	15					

Lanes, Volumes, Timings

6: Kerr Street & Prince Charles Drive

02/28/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔		↔		↔		↔		↔		↔		
Traffic Volume (vph)	10	0	10	10	0	30	5	460	10	20	595	25	
Future Volume (vph)	10	0	10	10	0	30	5	460	10	20	595	25	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt	0.932		0.900		0.997		0.995						
Flt Protected	0.976		0.987		0.998								
Satd. Flow (prot)	0	1728	0	0	1688	0	0	1872	0	0	1847	0	
Flt Permitted	0.976		0.987		0.998								
Satd. Flow (perm)	0	1728	0	0	1688	0	0	1872	0	0	1847	0	
Link Speed (k/h)	40		40		50		50						
Link Distance (m)	57.8		56.0		134.8		127.4						
Travel Time (s)	5.2		5.0		9.7		9.2						
Confl. Peds. (#/hr)	4	1		1		4	21	31		31		21	
Confl. Bikes (#/hr)									1				
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Heavy Vehicles (%)	0%	50%	0%	0%	0%	0%	20%	1%	0%	5%	2%	4%	
Adj. Flow (vph)	11	0	11	11	0	32	5	484	11	21	626	26	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	22	0	0	43	0	0	500	0	0	673	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)	0.0		0.0		0.0		0.0		3.6				
Link Offset(m)	0.0		0.0		0.0		0.0		0.0				
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6				
Two way Left Turn Lane													
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (k/h)	24	14		24		14		24		14		24	
Sign Control	Stop		Stop		Free		Free		Free				
Intersection Summary													
Area Type:	Other												
Control Type:	Unsignalized												
Intersection Capacity Utilization	56.6%						ICU Level of Service B						
Analysis Period (min)	15												

HCM Unsignalized Intersection Capacity Analysis

6: Kerr Street & Prince Charles Drive

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	10	0	10	10	0	30	5	460	10	20	595	25
Future Volume (Veh/h)	10	0	10	10	0	30	5	460	10	20	595	25
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	0	11	11	0	32	5	484	11	21	626	26
Pedestrians	21			31			1			4		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	2			3			0			0		
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (m)							238			127		
pX, platoon unblocked	0.77	0.77	0.76	0.77	0.77	0.96	0.76				0.96	
vC, conflicting volume	1238	1238	661	1224	1246	524	673				526	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1054	1055	391	1036	1065	487	407				489	
tC, single (s)	7.1	7.0	6.2	7.1	6.5	6.2	4.3				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.5	3.3	3.5	4.0	3.3	2.4				2.2	
p0 queue free %	92	100	98	93	100	94	99				98	
cM capacity (veh/h)	138	134	491	147	161	545	787				991	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	22	43	500	673								
Volume Left	11	11	5	21								
Volume Right	11	32	11	26								
cSH	216	322	787	991								
Volume to Capacity	0.10	0.13	0.01	0.02								
Queue Length 95th (m)	2.6	3.5	0.1	0.5								
Control Delay (s)	23.6	17.9	0.2	0.6								
Lane LOS	C	C	A	A								
Approach Delay (s)	23.6	17.9	0.2	0.6								
Approach LOS	C	C										
Intersection Summary												
Average Delay				1.4								
Intersection Capacity Utilization				56.6%	ICU Level of Service							B
Analysis Period (min)				15								

Lanes, Volumes, Timings

7: Kerr Street & Elmwood Road

02/28/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	15	10	5	460	575	40
Future Volume (vph)	15	10	5	460	575	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.945				0.991	
Fit Protected	0.971				0.999	
Satd. Flow (prot)	1675	0	0	1858	1840	0
Fit Permitted	0.971				0.999	
Satd. Flow (perm)	1675	0	0	1858	1840	0
Link Speed (k/h)	40				50	50
Link Distance (m)	171.2				103.0	134.8
Travel Time (s)	15.4				7.4	9.7
Confl. Peds. (#/hr)	1	2	34			34
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	10%	20%	2%	2%	7%
Adj. Flow (vph)	16	11	5	484	605	42
Shared Lane Traffic (%)						
Lane Group Flow (vph)	27	0	0	489	647	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6				0.0	0.0
Link Offset(m)	0.0				0.0	0.0
Crosswalk Width(m)	1.6				1.6	1.6
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24			
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	43.5%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

7: Kerr Street & Elmwood Road

02/28/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↕		↔	
Traffic Volume (veh/h)	15	10	5	460	575	40
Future Volume (Veh/h)	15	10	5	460	575	40
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	11	5	484	605	42
Pedestrians	34		2		1	
Lane Width (m)	3.6		3.6		3.6	
Walking Speed (m/s)	1.1		1.1		1.1	
Percent Blockage	3		0		0	
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)			103		262	
pX, platoon unblocked	0.85	0.81	0.81			
vC, conflicting volume	1155	662	681			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	889	464	488			
tC, single (s)	6.4	6.3	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.4			
p0 queue free %	94	98	99			
cM capacity (veh/h)	258	455	775			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	27	489	647			
Volume Left	16	5	0			
Volume Right	11	0	42			
cSH	313	775	1700			
Volume to Capacity	0.09	0.01	0.38			
Queue Length 95th (m)	2.1	0.1	0.0			
Control Delay (s)	17.6	0.2	0.0			
Lane LOS	C	A				
Approach Delay (s)	17.6	0.2	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			43.5%		ICU Level of Service A	
Analysis Period (min)			15			

Lanes, Volumes, Timings

8: Kerr Street & Stewart Street

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↕		↔		↕		↔		↕	
Traffic Volume (vph)	50	10	15	10	15	75	10	340	15	55	480	50
Future Volume (vph)	50	10	15	10	15	75	10	340	15	55	480	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.97		0.96		1.00		1.00		0.99		0.99	
Frt	0.973		0.898		0.995		0.995		0.989		0.989	
Flt Protected	0.968		0.995		0.999		0.999		0.995		0.995	
Satd. Flow (prot)	0	1705	0	0	1577	0	0	1854	0	0	1826	0
Flt Permitted	0.771		0.967		0.983		0.983		0.932		0.932	
Satd. Flow (perm)	0	1333	0	0	1530	0	0	1823	0	0	1708	0
Right Turn on Red			Yes		Yes		Yes		Yes		Yes	
Satd. Flow (RTOR)	16		82		3		9		9		9	
Link Speed (k/h)	40		40		50		50		50		50	
Link Distance (m)	95.6		60.6		165.0		103.0		103.0		103.0	
Travel Time (s)	8.6		5.5		11.9		7.4		7.4		7.4	
Confl. Peds. (#/hr)	20		15		15		20		35		25	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Adj. Flow (vph)	54	11	16	11	16	82	11	370	16	60	522	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	81	0	0	109	0	0	397	0	0	636	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6		1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24	14	24	14	24	14	24	14	24	14
Number of Detectors	1	2	1	2	1	2	1	2	1	2	1	2
Detector Template	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left	Thru	Left	Thru
Leading Detector (m)	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0	2.0	10.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)	9.4		9.4		9.4		9.4		9.4		9.4	
Detector 2 Size(m)	0.6		0.6		0.6		0.6		0.6		0.6	
Detector 2 Type	CI+Ex		CI+Ex		CI+Ex		CI+Ex		CI+Ex		CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)	0.0		0.0		0.0		0.0		0.0		0.0	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA	NA	NA
Protected Phases	4		8		8		2		1		6	
Permitted Phases	4		8		8		2		6		6	

Lanes, Volumes, Timings
8: Kerr Street & Stewart Street

02/28/2024

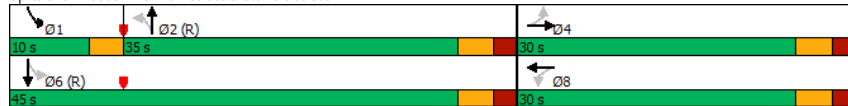


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		24.0	24.0		6.0	24.0	
Minimum Split (s)	30.0	30.0		30.0	30.0		32.0	32.0		10.0	32.0	
Total Split (s)	30.0	30.0		30.0	30.0		35.0	35.0		10.0	45.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		46.7%	46.7%		13.3%	60.0%	
Maximum Green (s)	24.6	24.6		24.6	24.6		29.6	29.6		7.0	39.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.0	3.3	
All-Red Time (s)	2.1	2.1		2.1	2.1		2.1	2.1		0.0	2.1	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.4			5.4			5.4			5.4	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
Recall Mode	None	None		None	None		C-Min	C-Min		None	C-Min	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	20	20		20	20		35	35		35	35	
Act Effect Green (s)		15.2			15.2			53.2			53.2	
Actuated g/C Ratio		0.20			0.20			0.71			0.71	
v/c Ratio		0.29			0.29			0.31			0.52	
Control Delay		21.5			9.9			7.5			10.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		21.5			9.9			7.5			10.3	
LOS		C			A			A			B	
Approach Delay		21.5			9.9			7.5			10.3	
Approach LOS		C			A			A			B	

Intersection Summary

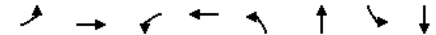
Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.52
 Intersection Signal Delay: 10.1
 Intersection Capacity Utilization 78.4%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service D

Splits and Phases: 8: Kerr Street & Stewart Street



Timings
8: Kerr Street & Stewart Street

02/28/2024

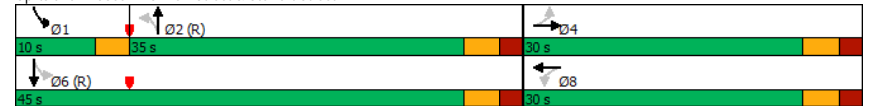


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	50	10		10	15	10	340	55	480
Future Volume (vph)	50	10		10	15	10	340	55	480
Turn Type	Perm	NA		Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8	8		2	1	6
Permitted Phases	4			8		2		6	
Detector Phase	4	4		8	8	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0		10.0	10.0	24.0	24.0	6.0	24.0
Minimum Split (s)	30.0	30.0		30.0	30.0	32.0	32.0	10.0	32.0
Total Split (s)	30.0	30.0		30.0	30.0	35.0	35.0	10.0	45.0
Total Split (%)	40.0%	40.0%		40.0%	40.0%	46.7%	46.7%	13.3%	60.0%
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	3.3	3.0	3.3
All-Red Time (s)	2.1	2.1		2.1	2.1	2.1	2.1	0.0	2.1
Lost Time Adjust (s)		0.0			0.0		0.0		0.0
Total Lost Time (s)		5.4			5.4		5.4		5.4
Lead/Lag						Lag	Lag	Lead	
Lead-Lag Optimize?						Yes	Yes	Yes	
Recall Mode	None	None		None	None	C-Min	C-Min	None	C-Min
Act Effect Green (s)		15.2			15.2		53.2		53.2
Actuated g/C Ratio		0.20			0.20		0.71		0.71
v/c Ratio		0.29			0.29		0.31		0.52
Control Delay		21.5			9.9		7.5		10.3
Queue Delay		0.0			0.0		0.0		0.0
Total Delay		21.5			9.9		7.5		10.3
LOS		C			A		A		B
Approach Delay		21.5			9.9		7.5		10.3
Approach LOS		C			A		A		B

Intersection Summary

Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.52
 Intersection Signal Delay: 10.1
 Intersection Capacity Utilization 78.4%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service D

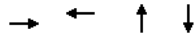
Splits and Phases: 8: Kerr Street & Stewart Street



Queues

8: Kerr Street & Stewart Street

02/28/2024



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	81	109	397	636
w/c Ratio	0.29	0.29	0.31	0.52
Control Delay	21.5	9.9	7.5	10.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.5	9.9	7.5	10.3
Queue Length 50th (m)	8.5	3.4	15.8	31.1
Queue Length 95th (m)	16.4	13.0	47.3	93.8
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)				
Base Capacity (vph)	447	556	1293	1213
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced w/c Ratio	0.18	0.20	0.31	0.52
Intersection Summary				

HCM Signalized Intersection Capacity Analysis

8: Kerr Street & Stewart Street

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	50	10	15	10	15	75	10	340	15	55	480	50
Future Volume (vph)	50	10	15	10	15	75	10	340	15	55	480	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.4			5.4			5.4			5.4	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.99			0.96			1.00			0.99	
Flpb, ped/bikes		0.98			1.00			1.00			1.00	
Frt		0.97			0.90			0.99			0.99	
Flt Protected		0.97			0.99			1.00			1.00	
Satd. Flow (prot)		1675			1575			1852			1822	
Flt Permitted		0.77			0.97			0.98			0.93	
Satd. Flow (perm)		1334			1530			1823			1707	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	11	16	11	16	82	11	370	16	60	522	54
RTOR Reduction (vph)	0	13	0	0	68	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	68	0	0	41	0	0	396	0	0	633	0
Confl. Peds. (#/hr)	20		15	15		20	35		25	25		35
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.2			13.2			51.0			51.0	
Effective Green, g (s)		13.2			13.2			51.0			51.0	
Actuated g/C Ratio		0.18			0.18			0.68			0.68	
Clearance Time (s)		5.4			5.4			5.4			5.4	
Vehicle Extension (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		234			269			1239			1160	
v/s Ratio Prot												
v/s Ratio Perm		c0.05			0.03			0.22			c0.37	
v/c Ratio		0.29			0.15			0.32			0.55	
Uniform Delay, d1		26.8			26.2			4.9			6.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.9			0.4			0.7			0.5	
Delay (s)		27.8			26.5			5.6			6.6	
Level of Service		C			C			A			A	
Approach Delay (s)		27.8			26.5			5.6			6.6	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		9.5			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.52										
Actuated Cycle Length (s)		75.0			Sum of lost time (s)			13.8				
Intersection Capacity Utilization		78.4%			ICU Level of Service			D				
Analysis Period (min)		15										

c Critical Lane Group

Lanes, Volumes, Timings

9: Speers Internal Road 1 & Speers Road

02/28/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖	↗
Traffic Volume (vph)	980	35	5	1525	0	5
Future Volume (vph)	980	35	5	1525	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt	0.995			0.865		
Flt Protected						
Satd. Flow (prot)	3592	0	0	3610	1644	0
Flt Permitted						
Satd. Flow (perm)	3592	0	0	3610	1644	0
Link Speed (k/h)	60			60	20	
Link Distance (m)	147.2			113.4	44.5	
Travel Time (s)	8.8			6.8	8.0	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1000	36	5	1556	0	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1036	0	0	1561	5	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	55.6%
Analysis Period (min)	15
	ICU Level of Service B

HCM Unsignalized Intersection Capacity Analysis

9: Speers Internal Road 1 & Speers Road

02/28/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↖	↗
Traffic Volume (veh/h)	980	35	5	1525	0	5
Future Volume (Veh/h)	980	35	5	1525	0	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	1000	36	5	1556	0	5
Pedestrians	1			1		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	147			347		
pX, platoon unblocked			0.88		0.90	0.88
vC, conflicting volume			1036		1807	519
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			771		1088	184
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	99
cM capacity (veh/h)			751		191	733

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	667	369	524	1037	5
Volume Left	0	0	5	0	0
Volume Right	0	36	0	0	5
cSH	1700	1700	751	1700	733
Volume to Capacity	0.39	0.22	0.01	0.61	0.01
Queue Length 95th (m)	0.0	0.0	0.2	0.0	0.2
Control Delay (s)	0.0	0.0	0.2	0.0	9.9
Lane LOS			A		A
Approach Delay (s)	0.0		0.1		9.9
Approach LOS					A

Intersection Summary

Average Delay	0.1
Intersection Capacity Utilization	55.6%
Analysis Period (min)	15
	ICU Level of Service B

Lanes, Volumes, Timings

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/28/2024

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	0	5	0	0	35	5
Future Volume (vph)	0	5	0	0	35	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected						0.958
Satd. Flow (prot)	1644	0	1900	0	0	1820
Flt Permitted						0.958
Satd. Flow (perm)	1644	0	1900	0	0	1820
Link Speed (k/h)	20					
Link Distance (m)	35.0		49.5		44.5	
Travel Time (s)	6.3		8.9		8.0	
Confl. Peds. (#/hr)	8					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%					
Adj. Flow (vph)	0	6	0	0	44	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	0	0	0	0	50
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6					
Link Offset(m)	0.0					
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	14		24	
Sign Control	Stop		Free		Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	15.7% ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/28/2024

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	0	5	0	0	35	5
Future Volume (Veh/h)	0	5	0	0	35	5
Sign Control	Stop		Free		Free	
Grade	0%					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	6	0	0	44	6
Pedestrians	2					
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0					1
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	96	8	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	96	8	0			
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			97	
cM capacity (veh/h)	882	1072			1636	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	6	0	50
Volume Left	0	0	44
Volume Right	6	0	0
cSH	1072	1700	1636
Volume to Capacity	0.01	0.00	0.03
Queue Length 95th (m)	0.1	0.0	0.6
Control Delay (s)	8.4	0.0	6.4
Lane LOS	A		A
Approach Delay (s)	8.4	0.0	6.4
Approach LOS	A		

Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	15.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings

11: PUDO + Parking & Speers Internal Road

02/28/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (vph)	25	10	5	5	0	5
Future Volume (vph)	25	10	5	5	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.961					0.865
Flt Protected				0.976		
Satd. Flow (prot)	1826	0	0	1854	1644	0
Flt Permitted				0.976		
Satd. Flow (perm)	1826	0	0	1854	1644	0
Link Speed (k/h)	20		20		20	
Link Distance (m)	35.0		37.7		75.1	
Travel Time (s)	6.3		6.8		13.5	
Confl. Peds. (#/hr)				13		
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	32	13	6	6	0	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	45	0	0	12	6	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0		0.0		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	14		24		24	
Sign Control	Free		Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	14.7%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

11: PUDO + Parking & Speers Internal Road

02/28/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (veh/h)	25	10	5	5	0	5
Future Volume (Veh/h)	25	10	5	5	0	5
Sign Control	Free			Free	Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	32	13	6	6	0	6
Pedestrians	13		2			
Lane Width (m)	3.6		3.6			
Walking Speed (m/s)	1.1		1.1			
Percent Blockage	1		0			
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			45		70	40
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			45		70	40
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			1576		925	1035

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	45	12	6
Volume Left	0	6	0
Volume Right	13	0	6
cSH	1700	1576	1035
Volume to Capacity	0.03	0.00	0.01
Queue Length 95th (m)	0.0	0.1	0.1
Control Delay (s)	0.0	3.7	8.5
Lane LOS		A	A
Approach Delay (s)	0.0	3.7	8.5
Approach LOS		A	

Intersection Summary

Average Delay	1.5	
Intersection Capacity Utilization	14.7%	ICU Level of Service A
Analysis Period (min)	15	

Lanes, Volumes, Timings

12: Underground & Speers Internal Road

02/28/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (vph)	25	5	5	10	0	0
Future Volume (vph)	25	5	5	10	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.979					
Flt Protected				0.984		
Satd. Flow (prot)	1860	0	0	1870	1900	0
Flt Permitted				0.984		
Satd. Flow (perm)	1860	0	0	1870	1900	0
Link Speed (k/h)	20		20		20	
Link Distance (m)	37.7		38.9		38.9	
Travel Time (s)	6.8		7.0		7.0	
Confl. Peds. (#/hr)			10			
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	32	6	6	13	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	38	0	0	19	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0		0.0		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	14		24		24	
Sign Control	Free		Free		Stop	

Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	8.3%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

12: Underground & Speers Internal Road

02/28/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (veh/h)	25	5	5	10	0	0
Future Volume (Veh/h)	25	5	5	10	0	0
Sign Control	Free		Free		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	32	6	6	13	0	0
Pedestrians	10		3			
Lane Width (m)	3.6		3.6			
Walking Speed (m/s)	1.1		1.1			
Percent Blockage	1		0			
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			38		70	38
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			38		70	38
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1585		927	1037

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	38	19	0
Volume Left	0	6	0
Volume Right	6	0	0
cSH	1700	1585	1700
Volume to Capacity	0.02	0.00	0.01
Queue Length 95th (m)	0.0	0.1	0.0
Control Delay (s)	0.0	2.3	0.0
Lane LOS	A		
Approach Delay (s)	0.0	2.3	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	8.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings

13: PUDO Exit/Speers Internal Road 2 & Speers Internal Road/30 Speers

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		+			+			+			+	
Traffic Volume (vph)	5	20	0	0	0	10	0	5	0	0	0	15
Future Volume (vph)	5	20	0	0	0	10	0	5	0	0	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.865											
Fit Protected	0.990											
Satd. Flow (prot)	0	1809	0	0	1644	0	0	1900	0	0	1467	0
Fit Permitted	0.990											
Satd. Flow (perm)	0	1809	0	0	1644	0	0	1900	0	0	1467	0
Link Speed (k/h)	20											
Link Distance (m)	38.9			43.4			75.5			49.2		
Travel Time (s)	7.0			7.8			13.6			8.9		
Confl. Peds. (#/hr)	2		8	8		2		7	7			
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Heavy Vehicles (%)	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%
Adj. Flow (vph)	8	32	0	0	0	16	0	8	0	0	0	24
Shared Lane Traffic (%)	0											
Lane Group Flow (vph)	0	40	0	0	16	0	0	8	0	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0											
Link Offset(m)	0.0											
Crosswalk Width(m)	1.6			1.6			1.6			1.6		
Two way Left Turn Lane	No											
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control	Stop				Stop				Free		Free	

Intersection Summary

Area Type: Other
 Control Type: Unsignalized
 Intersection Capacity Utilization 19.3% ICU Level of Service A
 Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis

13: PUDO Exit/Speers Internal Road 2 & Speers Internal Road/30 Speers

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		+			+			+			+		
Traffic Volume (veh/h)	5	20	0	0	0	10	0	5	0	0	0	15	
Future Volume (Veh/h)	5	20	0	0	0	10	0	5	0	0	0	15	
Sign Control	Stop				Stop				Free		Free		
Grade	0%												
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	
Hourly flow rate (vph)	8	32	0	0	0	16	0	8	0	0	0	24	
Pedestrians	3												
Lane Width (m)	3.6			3.6			3.6			3.6			
Walking Speed (m/s)	1.1			1.1			1.1			1.1			
Percent Blockage	0			1			1			0			
Right turn flare (veh)	0												
Median type							None			None			
Median storage (veh)	0												
Upstream signal (m)	0												
pX, platoon unblocked	0												
vC, conflicting volume	42	30	23	51	42	18	27						15
vC1, stage 1 conf vol	0												
vC2, stage 2 conf vol	0												
vCu, unblocked vol	42	30	23	51	42	18	27						15
tC, single (s)	7.3	6.5	6.2	7.1	6.5	6.2	4.1						4.1
tC, 2 stage (s)	0												
tF (s)	3.7	4.0	3.3	3.5	4.0	3.3	2.2						2.2
p0 queue free %	99	96	100	100	100	98	100						100
cM capacity (veh/h)	893	859	1049	907	846	1057	1596						1606

Direction, Lane #

	EB 1	WB 1	NB 1	SB 1
Volume Total	40	16	8	24
Volume Left	8	0	0	0
Volume Right	0	16	0	24
cSH	866	1057	1596	1606
Volume to Capacity	0.05	0.02	0.00	0.00
Queue Length 95th (m)	1.1	0.4	0.0	0.0
Control Delay (s)	9.4	8.5	0.0	0.0
Lane LOS	A	A		
Approach Delay (s)	9.4	8.5	0.0	0.0
Approach LOS	A	A		

Intersection Summary

Average Delay 5.8
 Intersection Capacity Utilization 19.3% ICU Level of Service A
 Analysis Period (min) 15

Lanes, Volumes, Timings

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/28/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (vph)	0	985	5	10	1515	0	10	0	10	5	0	5
Future Volume (vph)	0	985	5	10	1515	0	10	0	10	5	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999						0.932			0.932	
Flt Protected								0.976			0.976	
Satd. Flow (prot)	0	3536	0	0	3540	0	0	1728	0	0	1694	0
Flt Permitted								0.976			0.976	
Satd. Flow (perm)	0	3536	0	0	3540	0	0	1728	0	0	1694	0
Link Speed (k/h)		60			60			20			20	
Link Distance (m)		113.4			233.1			49.2			39.0	
Travel Time (s)		6.8			14.0			8.9			7.0	
Confl. Peds. (#/hr)			8	8								
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	2%	0%	2%	2%	2%
Adj. Flow (vph)	0	1037	5	11	1595	0	11	0	11	5	0	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1042	0	0	1606	0	0	22	0	0	10	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	58.9%
ICU Level of Service	B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/28/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (veh/h)	0	985	5	10	1515	0	10	0	10	5	0	5
Future Volume (Veh/h)	0	985	5	10	1515	0	10	0	10	5	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Hourly flow rate (vph)	0	1037	5	11	1595	0	11	0	11	5	0	5
Pedestrians		4			4			8			8	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		0			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		261			233							
pX, platoon unblocked	0.84				0.90			0.89	0.89	0.90	0.89	0.84
vC, conflicting volume	1595				1050			1876	2664	533	2150	2667
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1327				838			1239	2126	265	1548	2129
tC, single (s)	4.1				4.1			7.5	6.5	6.9	7.5	6.5
tC, 2 stage (s)												
tF (s)	2.2				2.2			3.5	4.0	3.3	3.5	4.0
p0 queue free %	100				98			90	100	98	92	100
cM capacity (veh/h)	434				721			115	43	660	66	43

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	691	351	543	1063	22	10
Volume Left	0	0	11	0	11	5
Volume Right	0	5	0	0	11	5
cSH	1700	1700	721	1700	195	118
Volume to Capacity	0.41	0.21	0.02	0.63	0.11	0.09
Queue Length 95th (m)	0.0	0.0	0.4	0.0	2.8	2.1
Control Delay (s)	0.0	0.0	0.4	0.0	25.8	38.4
Lane LOS			A		D	E
Approach Delay (s)	0.0		0.1		25.8	38.4
Approach LOS			D		E	

Intersection Summary

Average Delay	0.4
Intersection Capacity Utilization	58.9%
ICU Level of Service	B
Analysis Period (min)	15

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

2026 Future Background AM
50 Speers Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	35	645	90	185	485	185	100	115	370	350	165	75
Future Volume (vph)	35	645	90	185	485	185	100	115	370	350	165	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	105.0		0.0	75.0		100.0	50.0		45.0	0.0		0.0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	1.00				0.94	0.96		0.93	0.95		0.98
Frt		0.982				0.850			0.850		0.953	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3469	0	1752	3539	1583	1787	1900	1599	1787	1771	0
Flt Permitted	0.464			0.235			0.602			0.567		
Satd. Flow (perm)	862	3469	0	433	3539	1485	1085	1900	1486	1016	1771	0
Right Turn on Red			Yes			Yes		Yes				Yes
Satd. Flow (RTOR)	13					195			255		22	
Link Speed (kh)	60			60			50			50		
Link Distance (m)	235.8			147.2			127.4			167.2		
Travel Time (s)	14.1			8.8			9.2			12.0		
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Adj. Flow (vph)	37	679	95	195	511	195	105	121	389	368	174	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	774	0	195	511	195	105	121	389	368	253	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Left	Left	Right	Left	Left	Right	Right
Median Width(m)	3.6			3.6			3.6			3.6		
Link Offset(m)	0.0			0.0			0.0			0.0		
Crosswalk Width(m)	1.6			1.6			1.6			1.6		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2	1	1		2
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

2026 Future Background AM
50 Speers Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2		2	4		4	8		
Detector Phase	1	6		5	2	2	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	7.0	25.0		7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0	
Minimum Split (s)	10.0	30.9		10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3	
Total Split (s)	11.0	42.0		14.0	45.0	45.0	11.0	40.0	40.0	24.0	53.0	
Total Split (%)	9.2%	35.0%		11.7%	37.5%	37.5%	9.2%	33.3%	33.3%	20.0%	44.2%	
Maximum Green (s)	8.0	36.1		11.0	39.1	39.1	8.0	33.7	33.7	21.0	46.7	
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	
All-Red Time (s)	0.0	2.2		0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	5.5		2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	
Walk Time (s)		7.0			7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		14.0			14.0	14.0		14.0	14.0		14.0	
Pedestrian Calls (#/hr)		15			15	15		35	35		35	
Act Effect Green (s)	59.1	49.0		66.2	57.1	57.1	32.0	20.5	20.5	47.8	33.3	
Actuated g/C Ratio	0.49	0.41		0.55	0.48	0.48	0.27	0.17	0.17	0.40	0.28	
v/c Ratio	0.08	0.54		0.54	0.30	0.24	0.31	0.37	0.84	0.68	0.50	
Control Delay	16.4	30.6		21.7	22.8	4.5	24.6	44.8	31.4	33.1	34.8	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	16.4	30.6		21.7	22.8	4.5	24.6	44.8	31.4	33.1	34.8	
LOS	B	C		C	C	A	C	D	C	C	C	
Approach Delay		30.0			18.6			32.9			33.8	
Approach LOS		C			B			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 43 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 27.9

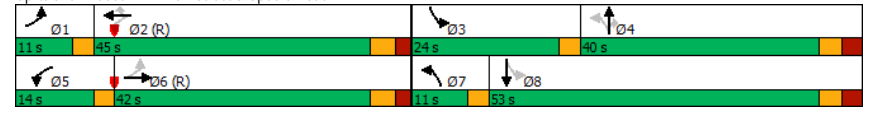
Intersection LOS: C

Intersection Capacity Utilization 82.0%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 1: Kerr Street & Speers Road



Timings
1: Kerr Street & Speers Road

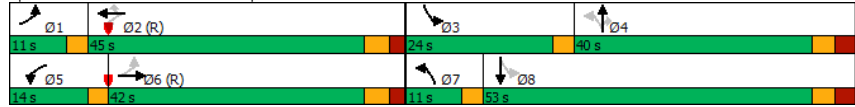
2026 Future Background AM
50 Speers Road

	↖	→	↙	←	↘	↖	↙	↘	↖	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	35	645	185	485	185	100	115	370	350	165
Future Volume (vph)	35	645	185	485	185	100	115	370	350	165
Turn Type	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	1	6	5	2		7	4		3	8
Permitted Phases	6	2	2	2	4	4	4	8		
Detector Phase	1	6	5	2	2	7	4	4	3	8
Switch Phase										
Minimum Initial (s)	7.0	25.0	7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0
Minimum Split (s)	10.0	30.9	10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3
Total Split (s)	11.0	42.0	14.0	45.0	45.0	11.0	40.0	40.0	24.0	53.0
Total Split (%)	9.2%	35.0%	11.7%	37.5%	37.5%	9.2%	33.3%	33.3%	20.0%	44.2%
Maximum Green (s)	8.0	36.1	11.0	39.1	39.1	8.0	33.7	33.7	21.0	46.7
Yellow Time (s)	3.0	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3
All-Red Time (s)	0.0	2.2	0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.5	5.5	2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Min	None	C-Min	C-Min	None	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)		15		15	15		35	35		35

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 43 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated

Splits and Phases: 1: Kerr Street & Speers Road



Queues
1: Kerr Street & Speers Road

2026 Future Background AM
50 Speers Road

	↖	→	↙	←	↘	↖	↙	↘	↖	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	37	774	195	511	195	105	121	389	368	253
v/c Ratio	0.08	0.54	0.54	0.30	0.24	0.31	0.37	0.84	0.68	0.50
Control Delay	16.4	30.6	21.7	22.8	4.5	24.6	44.8	31.4	33.1	34.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.4	30.6	21.7	22.8	4.5	24.6	44.8	31.4	33.1	34.8
Queue Length 50th (m)	4.0	74.6	23.3	41.8	0.0	15.0	25.4	31.3	62.5	44.8
Queue Length 95th (m)	11.1	107.2	44.3	65.1	15.8	22.2	37.7	61.3	75.7	59.5
Internal Link Dist (m)		211.8		123.2			103.4			143.2
Turn Bay Length (m)	105.0		75.0		100.0	50.0		45.0		
Base Capacity (vph)	492	1422	372	1684	808	339	533	600	542	702
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.54	0.52	0.30	0.24	0.31	0.23	0.65	0.68	0.36

Intersection Summary

HCM Signalized Intersection Capacity Analysis
1: Kerr Street & Speers Road

2026 Future Background AM
50 Speers Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	35	645	90	185	485	185	100	115	370	350	165	75
Future Volume (vph)	35	645	90	185	485	185	100	115	370	350	165	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	0.94	1.00	1.00	0.93	1.00	0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00	1.00	0.98	1.00	1.00	0.97	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1785	3468		1751	3539	1485	1743	1900	1486	1742	1771	
Flt Permitted	0.46	1.00		0.24	1.00	1.00	0.60	1.00	1.00	0.57	1.00	
Satd. Flow (perm)	871	3468		434	3539	1485	1105	1900	1486	1041	1771	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	37	679	95	195	511	195	105	121	389	368	174	79
RTOR Reduction (vph)	0	8	0	0	0	104	0	0	211	0	16	0
Lane Group Flow (vph)	37	766	0	195	511	91	105	121	178	368	237	0
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2		2	4		4	8		
Actuated Green, G (s)	53.4	49.0		63.3	55.9	55.9	28.7	20.5	20.5	44.5	33.3	
Effective Green, g (s)	53.4	49.0		63.3	55.9	55.9	28.7	20.5	20.5	44.5	33.3	
Actuated g/C Ratio	0.44	0.41		0.53	0.47	0.47	0.24	0.17	0.17	0.37	0.28	
Clearance Time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Vehicle Extension (s)	2.5	5.5		2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	
Lane Grp Cap (vph)	421	1416		352	1648	691	307	324	253	508	491	
v/s Ratio Prot	0.00	0.22		c0.05	0.14		0.02	0.06		c0.13	0.13	
v/s Ratio Perm	0.04			c0.24		0.06	0.06		0.12	c0.14		
v/c Ratio	0.09	0.54		0.55	0.31	0.13	0.34	0.37	0.70	0.72	0.48	
Uniform Delay, d1	18.9	27.0		17.0	20.0	18.2	37.0	44.1	46.9	30.2	36.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	1.5		1.5	0.5	0.4	0.5	1.0	9.1	4.8	1.0	
Delay (s)	18.9	28.5		18.5	20.5	18.6	37.4	45.1	56.0	35.0	37.2	
Level of Service	B	C		B	C	B	D	D	E	C	D	
Approach Delay (s)		28.0			19.7			50.7			35.9	
Approach LOS		C			B			D			D	

Intersection Summary		
HCM 2000 Control Delay	31.8	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.66	
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	82.0%	ICU Level of Service
Analysis Period (min)	15	

c Critical Lane Group

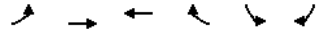
Lanes, Volumes, Timings
2: Speers Road & Cross Avenue

2026 Future Background AM
50 Speers Road

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	200	1195	595	20	5	245
Future Volume (vph)	200	1195	595	20	5	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	80.0			0.0	45.0	0.0
Storage Lanes	1			0	1	2
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	0.88
Ped Bike Factor	1.00		1.00			
Frt			0.995			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1703	3610	3554	0	1805	2733
Flt Permitted	0.378				0.950	
Satd. Flow (perm)	676	3610	3554	0	1805	2733
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			3			255
Link Speed (k/h)		60	60		48	
Link Distance (m)		233.1	101.5		84.0	
Travel Time (s)		14.0	6.1		6.3	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Adj. Flow (vph)	208	1245	620	21	5	255
Shared Lane Traffic (%)						
Lane Group Flow (vph)	208	1245	641	0	5	255
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
2: Speers Road & Cross Avenue

2026 Future Background AM
50 Speers Road



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Detector Phase	5	2	6		4	4
Switch Phase						
Minimum Initial (s)	6.0	38.0	38.0		10.0	10.0
Minimum Split (s)	12.0	47.6	47.6		15.8	15.8
Total Split (s)	35.0	109.0	74.0		31.0	31.0
Total Split (%)	25.0%	77.9%	52.9%		22.1%	22.1%
Maximum Green (s)	29.0	102.4	67.4		25.2	25.2
Yellow Time (s)	4.0	3.7	3.7		3.3	3.3
All-Red Time (s)	2.0	2.9	2.9		2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6		5.8	5.8
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Recall Mode	None	C-Min	C-Min		None	None
Walk Time (s)		10.0	10.0			
Flash Dont Walk (s)		31.0	31.0			
Pedestrian Calls (#/hr)		5	5			
Act Effect Green (s)	118.0	117.4	102.3		10.2	10.2
Actuated g/C Ratio	0.84	0.84	0.73		0.07	0.07
v/c Ratio	0.33	0.41	0.25		0.04	0.58
Control Delay	3.4	3.3	6.6		60.8	12.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	3.4	3.3	6.6		60.8	12.8
LOS	A	A	A		E	B
Approach Delay		3.3	6.6		13.7	
Approach LOS		A	A		B	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 99 (71%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 5.3
 Intersection Capacity Utilization 68.9%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service C

Splits and Phases: 2: Speers Road & Cross Avenue



Timings
2: Speers Road & Cross Avenue

2026 Future Background AM
50 Speers Road



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↕↕	↕↕	↔	↕↕
Traffic Volume (vph)	200	1195	595	5	245
Future Volume (vph)	200	1195	595	5	245
Turn Type	pm+pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2				4
Detector Phase	5	2	6	4	4
Switch Phase					
Minimum Initial (s)	6.0	38.0	38.0	10.0	10.0
Minimum Split (s)	12.0	47.6	47.6	15.8	15.8
Total Split (s)	35.0	109.0	74.0	31.0	31.0
Total Split (%)	25.0%	77.9%	52.9%	22.1%	22.1%
Maximum Green (s)	29.0	102.4	67.4	25.2	25.2
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Vehicle Extension (s)	3.5	5.0	5.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Min	C-Min	None	None
Walk Time (s)		10.0	10.0		
Flash Dont Walk (s)		31.0	31.0		
Pedestrian Calls (#/hr)		5	5		

Intersection Summary

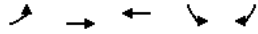
Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 99 (71%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated

Splits and Phases: 2: Speers Road & Cross Avenue



Queues
2: Speers Road & Cross Avenue

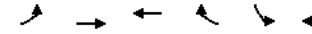
2026 Future Background AM
50 Speers Road



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	208	1245	641	5	255
w/c Ratio	0.33	0.41	0.25	0.04	0.58
Control Delay	3.4	3.3	6.6	60.8	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.4	3.3	6.6	60.8	12.8
Queue Length 50th (m)	7.9	34.6	27.1	1.3	0.0
Queue Length 95th (m)	12.9	43.9	37.4	5.8	14.3
Internal Link Dist (m)		209.1	77.5	60.0	
Turn Bay Length (m)	80.0		45.0		
Base Capacity (vph)	782	3026	2597	324	701
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.27	0.41	0.25	0.02	0.36
Intersection Summary					

HCM Signalized Intersection Capacity Analysis
2: Speers Road & Cross Avenue

2026 Future Background AM
50 Speers Road



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗↗	↗↗		↘	↗↗
Traffic Volume (vph)	200	1195	595	20	5	245
Future Volume (vph)	200	1195	595	20	5	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.6	6.6		5.8	5.8
Lane Util. Factor	1.00	0.95	0.95		1.00	0.88
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Fr	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1701	3610	3555		1805	2733
Flt Permitted	0.38	1.00	1.00		0.95	1.00
Satd. Flow (perm)	677	3610	3555		1805	2733
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	208	1245	620	21	5	255
RTOR Reduction (vph)	0	0	1	0	0	236
Lane Group Flow (vph)	208	1245	640	0	5	19
Confl. Peds. (#/hr)	5			5		
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	117.4	117.4	102.3		10.2	10.2
Effective Green, g (s)	117.4	117.4	102.3		10.2	10.2
Actuated g/C Ratio	0.84	0.84	0.73		0.07	0.07
Clearance Time (s)	6.0	6.6	6.6		5.8	5.8
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Lane Grp Cap (vph)	634	3027	2597		131	199
v/s Ratio Prot	0.02	c0.34	0.18		0.00	
v/s Ratio Perm	0.25					c0.01
v/c Ratio	0.33	0.41	0.25		0.04	0.09
Uniform Delay, d1	2.4	2.8	6.2		60.3	60.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.4	0.4	0.2		0.1	0.2
Delay (s)	2.8	3.2	6.4		60.5	60.8
Level of Service	A	A	A		E	E
Approach Delay (s)		3.1	6.4		60.8	
Approach LOS		A	A		E	
Intersection Summary						
HCM 2000 Control Delay		10.4			HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio		0.40				
Actuated Cycle Length (s)		140.0			Sum of lost time (s)	18.4
Intersection Capacity Utilization		68.9%			ICU Level of Service	C
Analysis Period (min)		15				
c Critical Lane Group						

Lanes, Volumes, Timings
3: St. Augustine Drive & Speers Road

2026 Future Background AM
50 Speers Road

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕↔			↕↔				↕		↕↔	
Traffic Volume (vph)	5	720	15	0	635	20	5	0	50	0	0	0
Future Volume (vph)	5	720	15	0	635	20	5	0	50	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0			0			1			0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.995				0.865			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1805	3561	0	0	3557	0	0	0	1644	0	1900	0
Flt Permitted	0.950							0.950				
Satd. Flow (perm)	1805	3561	0	0	3557	0	0	0	1644	0	1900	0
Link Speed (k/h)		60			60				40			30
Link Distance (m)		248.1			235.8				188.1			117.6
Travel Time (s)		14.9			14.1				16.9			14.1
Confl. Peds. (#/hr)	8		5	5		8	1		1	1		1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	5	750	16	0	661	21	5	0	52	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	766	0	0	682	0	0	5	52	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6				0.0			0.0
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		1.6			1.6				1.6			1.6
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free				Stop			Stop

Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization Err%	ICU Level of Service H											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
3: St. Augustine Drive & Speers Road

2026 Future Background AM
50 Speers Road

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	↔	↕↔			↕↔				↕		↕↔	
Lane Configurations	↔	↕↔			↕↔				↕		↕↔	
Traffic Volume (veh/h)	5	720	15	0	635	20	5	0	50	0	0	0
Future Volume (Veh/h)	5	720	15	0	635	20	5	0	50	0	0	0
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	750	16	0	661	21	5	0	52	0	0	0
Pedestrians	1			1			5			8		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	0			0			0			1		
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)	236											
pX, platoon unblocked	0.92						0.92	0.92				
vC, conflicting volume	690	771					1104	1463	389	1118	1460	350
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	486	771					937	1327	389	951	1325	116
tC, single (s)	4.1	4.1					7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2	2.2					3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99	100					98	100	92	100	100	100
cM capacity (veh/h)	992	849					201	142	612	179	142	839
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1					
Volume Total	5	500	266	441	241	57	0					
Volume Left	5	0	0	0	0	5	0					
Volume Right	0	0	16	0	21	52	0					
cSH	992	1700	1700	1700	1700	519	1700					
Volume to Capacity	0.01	0.29	0.16	0.26	0.14	0.11	0.00					
Queue Length 95th (m)	0.1	0.0	0.0	0.0	0.0	2.8	0.0					
Control Delay (s)	8.6	0.0	0.0	0.0	0.0	12.8	0.0					
Lane LOS	A						B	A				
Approach Delay (s)	0.1	0.0					12.8	0.0				
Approach LOS							B	A				
Intersection Summary												
Average Delay	0.5											
Intersection Capacity Utilization	Err%			ICU Level of Service				H				
Analysis Period (min)	15											

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

2026 Future Background AM
50 Speers Road

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖		↕			↘
Traffic Volume (vph)	80	165	270	60	95	515
Future Volume (vph)	80	165	270	60	95	515
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor	0.98		1.00			1.00
Frt	0.909		0.973			
Flt Protected	0.984					0.992
Satd. Flow (prot)	1652	0	3454	0	0	3551
Flt Permitted	0.984					0.840
Satd. Flow (perm)	1645	0	3454	0	0	3005
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	126		37			
Link Speed (kh)	50		50			50
Link Distance (m)	265.3		167.2			26.5
Travel Time (s)	19.1		12.0			1.9
Confl. Peds. (#/hr)	13	6		4	4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	1%	1%	2%	0%	1%
Adj. Flow (vph)	82	170	278	62	98	531
Shared Lane Traffic (%)						
Lane Group Flow (vph)	252	0	340	0	0	629
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (kh)	24	14		14	24	
Number of Detectors	1		2		1	2
Detector Template	Left		Thru		Left	Thru
Leading Detector (m)	2.0		10.0		2.0	10.0
Trailing Detector (m)	0.0		0.0		0.0	0.0
Detector 1 Position(m)	0.0		0.0		0.0	0.0
Detector 1 Size(m)	2.0		0.6		2.0	0.6
Detector 1 Type	CI+Ex		CI+Ex		CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0		0.0	0.0
Detector 1 Queue (s)	0.0		0.0		0.0	0.0
Detector 1 Delay (s)	0.0		0.0		0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			CI+Ex			CI+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases					6	

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

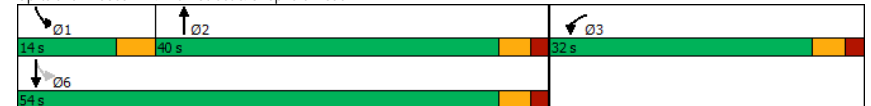
2026 Future Background AM
50 Speers Road

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase					1	6
Switch Phase						
Minimum Initial (s)	10.0		18.0		7.0	18.0
Minimum Split (s)	31.4		28.2		11.0	28.2
Total Split (s)	32.0		40.0		14.0	54.0
Total Split (%)	37.2%		46.5%		16.3%	62.8%
Maximum Green (s)	26.6		34.8		10.0	48.8
Yellow Time (s)	3.3		3.3		4.0	3.3
All-Red Time (s)	2.1		1.9		0.0	1.9
Lost Time Adjust (s)	0.0		0.0			0.0
Total Lost Time (s)	5.4		5.2			5.2
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.5		2.5	3.5
Recall Mode	None		Min		None	Min
Walk Time (s)	10.0		10.0			10.0
Flash Dont Walk (s)	16.0		13.0			13.0
Pedestrian Calls (#/hr)	0		5			5
Act Effect Green (s)	10.6		19.0			19.0
Actuated g/C Ratio	0.26		0.47			0.47
v/c Ratio	0.48		0.21			0.44
Control Delay	10.4		5.9			8.4
Queue Delay	0.0		0.0			0.0
Total Delay	10.4		5.9			8.4
LOS	B		A			A
Approach Delay	10.4		5.9			8.4
Approach LOS	B		A			A

Intersection Summary

Area Type: Other
 Cycle Length: 86
 Actuated Cycle Length: 40.2
 Natural Cycle: 75
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.48
 Intersection Signal Delay: 8.1
 Intersection Capacity Utilization 61.9%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 4: Kerr Street & Shepherd Road



Timings
4: Kerr Street & Shepherd Road

2026 Future Background AM
50 Speers Road

	↙	↑	↘	↓
Lane Group	WBL	NBT	SBL	SBT
Lane Configurations	↘↙	↑↑		↘↙
Traffic Volume (vph)	80	270	95	515
Future Volume (vph)	80	270	95	515
Turn Type	Prot	NA	pm+pt	NA
Protected Phases	3	2	1	6
Permitted Phases			6	
Detector Phase	3	2	1	6
Switch Phase				
Minimum Initial (s)	10.0	18.0	7.0	18.0
Minimum Split (s)	31.4	28.2	11.0	28.2
Total Split (s)	32.0	40.0	14.0	54.0
Total Split (%)	37.2%	46.5%	16.3%	62.8%
Maximum Green (s)	26.6	34.8	10.0	48.8
Yellow Time (s)	3.3	3.3	4.0	3.3
All-Red Time (s)	2.1	1.9	0.0	1.9
Lost Time Adjust (s)	0.0	0.0		0.0
Total Lost Time (s)	5.4	5.2		5.2
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Vehicle Extension (s)	3.0	3.5	2.5	3.5
Minimum Gap (s)	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0
Recall Mode	None	Min	None	Min
Walk Time (s)	10.0	10.0		10.0
Flash Dont Walk (s)	16.0	13.0		13.0
Pedestrian Calls (#/hr)	0	5		5

Intersection Summary

Cycle Length: 86
 Actuated Cycle Length: 40.2
 Natural Cycle: 75
 Control Type: Semi Act-Uncoord

Splits and Phases: 4: Kerr Street & Shepherd Road



Queues
4: Kerr Street & Shepherd Road

2026 Future Background AM
50 Speers Road

	↙	↑	↓
Lane Group	WBL	NBT	SBT
Lane Group Flow (vph)	252	340	629
v/c Ratio	0.48	0.21	0.44
Control Delay	10.4	5.9	8.4
Queue Delay	0.0	0.0	0.0
Total Delay	10.4	5.9	8.4
Queue Length 50th (m)	6.5	5.4	12.8
Queue Length 95th (m)	22.2	11.6	24.7
Internal Link Dist (m)	241.3	143.2	2.5
Turn Bay Length (m)			
Base Capacity (vph)	1141	3012	3005
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.22	0.11	0.21

Intersection Summary

HCM Signalized Intersection Capacity Analysis
4: Kerr Street & Shepherd Road

2026 Future Background AM
50 Speers Road

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↕	↕	↔	↕
Traffic Volume (vph)	80	165	270	60	95	515
Future Volume (vph)	80	165	270	60	95	515
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4		5.2			5.2
Lane Util. Factor	1.00		0.95			0.95
Frb, ped/bikes	0.99		1.00			1.00
Flpb, ped/bikes	1.00		1.00			1.00
Frt	0.91		0.97			1.00
Flt Protected	0.98		1.00			0.99
Satd. Flow (prot)	1655		3455			3551
Flt Permitted	0.98		1.00			0.84
Satd. Flow (perm)	1655		3455			3005
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	82	170	278	62	98	531
RTOR Reduction (vph)	93	0	20	0	0	0
Lane Group Flow (vph)	159	0	320	0	0	629
Confl. Peds. (#/hr)	13	6		4	4	
Heavy Vehicles (%)	3%	1%	1%	2%	0%	1%
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases					6	
Actuated Green, G (s)	10.6		19.0			19.0
Effective Green, g (s)	10.6		19.0			19.0
Actuated g/C Ratio	0.26		0.47			0.47
Clearance Time (s)	5.4		5.2			5.2
Vehicle Extension (s)	3.0		3.5			3.5
Lane Grp Cap (vph)	436		1632			1420
v/s Ratio Prot	c0.10		0.09			
v/s Ratio Perm						c0.21
v/c Ratio	0.37		0.20			0.44
Uniform Delay, d1	12.1		6.2			7.1
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	0.5		0.1			0.3
Delay (s)	12.6		6.2			7.3
Level of Service	B		A			A
Approach Delay (s)	12.6		6.2			7.3
Approach LOS	B		A			A
Intersection Summary						
HCM 2000 Control Delay			8.1		HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio			0.48			
Actuated Cycle Length (s)			40.2		Sum of lost time (s)	14.6
Intersection Capacity Utilization			61.9%		ICU Level of Service	B
Analysis Period (min)			15			

Lanes, Volumes, Timings
5: Kerr Street & Wyecroft Road

2026 Future Background AM
50 Speers Road

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↕	↕	↕	↕
Traffic Volume (vph)	5	85	190	250	525	125
Future Volume (vph)	5	85	190	250	525	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	75.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.872				0.974	
Flt Protected	0.997		0.950			
Satd. Flow (prot)	1592	0	1703	1900	1836	0
Flt Permitted	0.997		0.950			
Satd. Flow (perm)	1592	0	1703	1900	1836	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	561.6			442.6	98.1	
Travel Time (s)	40.4			31.9	7.1	
Confl. Peds. (#/hr)			5			5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	4%	6%	0%	0%	4%
Adj. Flow (vph)	5	90	202	266	559	133
Shared Lane Traffic (%)						
Lane Group Flow (vph)	95	0	202	266	692	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	61.4%			ICU Level of Service B		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
5: Kerr Street & Wycroft Road

2026 Future Background AM
50 Speers Road

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔		↔	
Traffic Volume (veh/h)	5	85	190	250	525	125
Future Volume (Veh/h)	5	85	190	250	525	125
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	5	90	202	266	559	133
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1300	630	697			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1300	630	697			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	96	81	77			
cM capacity (veh/h)	138	476	877			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	95	202	266	692		
Volume Left	5	202	0	0		
Volume Right	90	0	0	133		
cSH	421	877	1700	1700		
Volume to Capacity	0.23	0.23	0.16	0.41		
Queue Length 95th (m)	6.5	6.8	0.0	0.0		
Control Delay (s)	16.0	10.3	0.0	0.0		
Lane LOS	C	B				
Approach Delay (s)	16.0	4.5	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			2.9			
Intersection Capacity Utilization			61.4%		ICU Level of Service B	
Analysis Period (min)	15					

Lanes, Volumes, Timings
6: Kerr Street & Prince Charles Drive

2026 Future Background AM
50 Speers Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔		↔		↔		↔		↔		↔		
Traffic Volume (vph)	5	0	5	5	0	75	5	500	5	40	395	5	
Future Volume (vph)	5	0	5	5	0	75	5	500	5	40	395	5	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt	0.932		0.873		0.999		0.999		0.999				
Flt Protected	0.976		0.997		0.995		0.995		0.995				
Satd. Flow (prot)	0	1728	0	0	1654	0	0	1876	0	0	1846	0	
Flt Permitted	0.976		0.997		0.995		0.995		0.995				
Satd. Flow (perm)	0	1728	0	0	1654	0	0	1876	0	0	1846	0	
Link Speed (k/h)	40		40		50		50		50				
Link Distance (m)	57.8		56.0		134.8		127.4		127.4				
Travel Time (s)	5.2		5.0		9.7		9.2		9.2				
Confl. Peds. (#/hr)	4	1		1		4	21	31		31		21	
Confl. Bikes (#/hr)									1	1			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Heavy Vehicles (%)	0%	50%	0%	0%	0%	0%	20%	1%	0%	5%	2%	4%	
Adj. Flow (vph)	5	0	5	5	0	79	5	526	5	42	416	5	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	10	0	0	84	0	0	536	0	0	463	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)	0.0		0.0		0.0		0.0		3.6				
Link Offset(m)	0.0		0.0		0.0		0.0		0.0				
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6				
Two way Left Turn Lane													
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (k/h)	24	14		24		14		24		14		24	
Sign Control	Stop		Stop		Free		Free		Free				
Intersection Summary													
Area Type:	Other												
Control Type:	Unsignalized												
Intersection Capacity Utilization	60.4%						ICU Level of Service B						
Analysis Period (min)	15												

HCM Unsignalized Intersection Capacity Analysis
6: Kerr Street & Prince Charles Drive

2026 Future Background AM
50 Speers Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	5	0	5	5	0	75	5	500	5	40	395	5
Future Volume (Veh/h)	5	0	5	5	0	75	5	500	5	40	395	5
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	0	5	5	0	79	5	526	5	42	416	5
Pedestrians	21			31			1			4		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	2			3			0			0		
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (m)							238					
pX, platoon unblocked	0.89	0.89	0.86	0.89	0.89	0.94	0.86					0.94
vC, conflicting volume	1145	1096	440	1078	1096	564	442					562
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	952	896	267	877	896	505	268					504
tC, single (s)	7.1	7.0	6.2	7.1	6.5	6.2	4.3					4.1
tC, 2 stage (s)												
tF (s)	3.5	4.5	3.3	3.5	4.0	3.3	2.4					2.2
p0 queue free %	97	100	99	98	100	85	100					96
cM capacity (veh/h)	165	189	654	216	227	520	1009					957
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	10	84	536	463								
Volume Left	5	5	5	42								
Volume Right	5	79	5	5								
cSH	263	480	1009	957								
Volume to Capacity	0.04	0.17	0.00	0.04								
Queue Length 95th (m)	0.9	4.8	0.1	1.0								
Control Delay (s)	19.2	14.1	0.1	1.3								
Lane LOS	C	B	A	A								
Approach Delay (s)	19.2	14.1	0.1	1.3								
Approach LOS	C	B										
Intersection Summary												
Average Delay	1.9											
Intersection Capacity Utilization	60.4%			ICU Level of Service			B					
Analysis Period (min)	15											

Lanes, Volumes, Timings
7: Kerr Street & Elmwood Road

2026 Future Background AM
50 Speers Road



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	30	10	5	480	360	45
Future Volume (vph)	30	10	5	480	360	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.965				0.985	
Fit Protected	0.964					
Satd. Flow (prot)	1723	0	0	1860	1825	0
Fit Permitted	0.964					
Satd. Flow (perm)	1723	0	0	1860	1825	0
Link Speed (k/h)	40					
Link Distance (m)	171.2				103.0	
Travel Time (s)	15.4				7.4	
Confl. Peds. (#/hr)	1	2	34			34
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	10%	20%	2%	2%	7%
Adj. Flow (vph)	32	11	5	505	379	47
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	0	0	510	426	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6					
Link Offset(m)	0.0					
Crosswalk Width(m)	1.6				1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24	14		
Sign Control	Stop			Free		
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	39.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
7: Kerr Street & Elmwood Road

2026 Future Background AM
50 Speers Road

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↕	↕	
Traffic Volume (veh/h)	30	10	5	480	360	45
Future Volume (Veh/h)	30	10	5	480	360	45
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	32	11	5	505	379	47
Pedestrians	34		2		1	
Lane Width (m)	3.6		3.6		3.6	
Walking Speed (m/s)	1.1		1.1		1.1	
Percent Blockage	3		0		0	
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)			103		262	
pX, platoon unblocked	0.92	0.97	0.97			
vC, conflicting volume	952	438	460			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	841	410	432			
tC, single (s)	6.4	6.3	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.4			
p0 queue free %	89	98	99			
cM capacity (veh/h)	300	589	979			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	43	510	426			
Volume Left	32	5	0			
Volume Right	11	0	47			
cSH	343	979	1700			
Volume to Capacity	0.13	0.01	0.25			
Queue Length 95th (m)	3.2	0.1	0.0			
Control Delay (s)	17.0	0.1	0.0			
Lane LOS	C	A				
Approach Delay (s)	17.0	0.1	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			39.9%		ICU Level of Service A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
8: Kerr Street & Stewart Street

2026 Future Background AM
50 Speers Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	35	25	5	20	35	70	5	380	20	40	300	30
Future Volume (vph)	35	25	5	20	35	70	5	380	20	40	300	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98		0.97		1.00		1.00		0.99		0.99	
Frt	0.990		0.925		0.993		0.989		0.995		0.995	
Flt Protected	0.974		0.992		0.999		0.995		0.927		0.927	
Satd. Flow (prot)	0	1679	0	0	1616	0	0	1846	0	0	1827	0
Flt Permitted	0.796		0.941		0.996		0.927		0.927		0.927	
Satd. Flow (perm)	0	1353	0	0	1527	0	0	1840	0	0	1699	0
Right Turn on Red			Yes		Yes		Yes		Yes		Yes	
Satd. Flow (RTOR)	5		76		4		9		50		50	
Link Speed (k/h)	40		40		50		50		103.0		103.0	
Link Distance (m)	95.6		60.6		165.0		103.0		7.4		7.4	
Travel Time (s)	8.6		5.5		11.9		7.4		35		35	
Confl. Peds. (#/hr)	20		15	15		20	35		25	25		35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Adj. Flow (vph)	38	27	5	22	38	76	5	413	22	43	326	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	70	0	0	136	0	0	440	0	0	402	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6		1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases	4		8		8		2		1		6	
Permitted Phases	4		8		8		2		1		6	

Lanes, Volumes, Timings
8: Kerr Street & Stewart Street

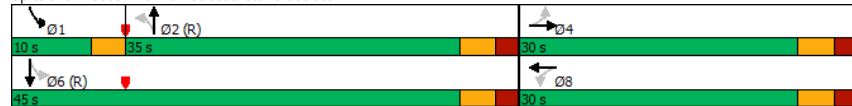
2026 Future Background AM
50 Speers Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		24.0	24.0		6.0	24.0	
Minimum Split (s)	30.0	30.0		30.0	30.0		32.0	32.0		10.0	32.0	
Total Split (s)	30.0	30.0		30.0	30.0		35.0	35.0		10.0	45.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		46.7%	46.7%		13.3%	60.0%	
Maximum Green (s)	24.6	24.6		24.6	24.6		29.6	29.6		7.0	39.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.0	3.3	
All-Red Time (s)	2.1	2.1		2.1	2.1		2.1	2.1		0.0	2.1	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.4			5.4			5.4			5.4	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
Recall Mode	None	None		None	None		C-Min	C-Min		None	C-Min	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0		
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		14.0	14.0		14.0		
Pedestrian Calls (#/hr)	20	20		20	20		35	35		35		
Act Effect Green (s)		15.2			15.2			53.2			53.2	
Actuated g/C Ratio		0.20			0.20			0.71			0.71	
v/c Ratio		0.25			0.37			0.34			0.33	
Control Delay		23.5			14.0			7.7			7.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		23.5			14.0			7.7			7.7	
LOS		C			B			A			A	
Approach Delay		23.5			14.0			7.7			7.7	
Approach LOS		C			B			A			A	

Intersection Summary

Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.37
 Intersection Signal Delay: 9.6 Intersection LOS: A
 Intersection Capacity Utilization 65.9% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 8: Kerr Street & Stewart Street



Timings
8: Kerr Street & Stewart Street

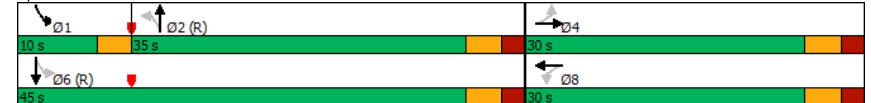
2026 Future Background AM
50 Speers Road

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕		↕		↕
Traffic Volume (vph)	35	25	20	35	5	380	40	300
Future Volume (vph)	35	25	20	35	5	380	40	300
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	24.0	24.0	6.0	24.0
Minimum Split (s)	30.0	30.0	30.0	30.0	32.0	32.0	10.0	32.0
Total Split (s)	30.0	30.0	30.0	30.0	35.0	35.0	10.0	45.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	46.7%	46.7%	13.3%	60.0%
Maximum Green (s)	24.6	24.6	24.6	24.6	29.6	29.6	7.0	39.6
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.0	3.3
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	2.1
Lost Time Adjust (s)		0.0		0.0		0.0		0.0
Total Lost Time (s)		5.4		5.4		5.4		5.4
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	C-Min	C-Min	None	C-Min
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)	13.0	13.0	13.0	13.0	14.0	14.0		14.0
Pedestrian Calls (#/hr)	20	20	20	20	35	35		35

Intersection Summary

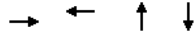
Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated

Splits and Phases: 8: Kerr Street & Stewart Street



Queues
8: Kerr Street & Stewart Street

2026 Future Background AM
50 Speers Road



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	70	136	440	402
w/c Ratio	0.25	0.37	0.34	0.33
Control Delay	23.5	14.0	7.7	7.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.5	14.0	7.7	7.7
Queue Length 50th (m)	8.5	7.8	17.9	16.1
Queue Length 95th (m)	15.7	18.1	53.2	49.2
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)				
Base Capacity (vph)	447	551	1305	1207
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced w/c Ratio	0.16	0.25	0.34	0.33
Intersection Summary				

HCM Signalized Intersection Capacity Analysis
8: Kerr Street & Stewart Street

2026 Future Background AM
50 Speers Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	35	25	5	20	35	70	5	380	20	40	300	30
Future Volume (vph)	35	25	5	20	35	70	5	380	20	40	300	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.4			5.4			5.4			5.4	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		1.00			0.97			1.00			0.99	
Flpb, ped/bikes		0.99			1.00			1.00			1.00	
Frt		0.99			0.92			0.99			0.99	
Flt Protected		0.97			0.99			1.00			0.99	
Satd. Flow (prot)		1656			1609			1847			1822	
Flt Permitted		0.80			0.94			1.00			0.93	
Satd. Flow (perm)		1354			1526			1841			1698	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	27	5	22	38	76	5	413	22	43	326	33
RTOR Reduction (vph)	0	4	0	0	63	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	66	0	0	73	0	0	439	0	0	399	0
Confl. Peds. (#/hr)	20		15	15		20	35		25	25		35
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2			1	6
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.2			13.2			51.0			51.0	
Effective Green, g (s)		13.2			13.2			51.0			51.0	
Actuated g/C Ratio		0.18			0.18			0.68			0.68	
Clearance Time (s)		5.4			5.4			5.4			5.4	
Vehicle Extension (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		238			268			1251			1154	
v/s Ratio Prot												
v/s Ratio Perm		c0.05			0.05			c0.24			0.24	
v/c Ratio		0.28			0.27			0.35			0.35	
Uniform Delay, d1		26.8			26.8			5.0			5.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.9			0.8			0.8			0.2	
Delay (s)		27.6			27.5			5.8			5.2	
Level of Service		C			C			A			A	
Approach Delay (s)		27.6			27.5			5.8			5.2	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay				9.9				HCM 2000 Level of Service			A	
HCM 2000 Volume to Capacity ratio				0.35								
Actuated Cycle Length (s)				75.0				Sum of lost time (s)			13.8	
Intersection Capacity Utilization				65.9%				ICU Level of Service			C	
Analysis Period (min)				15								

Lanes, Volumes, Timings

2026 Future Background AM

9: Speers Internal Road 1 & Speers Road

50 Speers Road



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↔	
Traffic Volume (vph)	1360	5	0	850	5	0
Future Volume (vph)	1360	5	0	850	5	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt	0.999					
Flt Protected				0.950		
Satd. Flow (prot)	3606	0	0	3610	1805	0
Flt Permitted	0.950					
Satd. Flow (perm)	3606	0	0	3610	1805	0
Link Speed (k/h)	60		60		20	
Link Distance (m)	147.2		113.4		44.5	
Travel Time (s)	8.8		6.8		8.0	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1388	5	0	867	5	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1393	0	0	867	5	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6		3.6		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	14		24		14	
Sign Control	Free		Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	47.8%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

2026 Future Background AM

9: Speers Internal Road 1 & Speers Road

50 Speers Road



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↔	
Traffic Volume (veh/h)	1360	5	0	850	5	0
Future Volume (Veh/h)	1360	5	0	850	5	0
Sign Control	Free			Stop		
Grade	0%					
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	1388	5	0	867	5	0
Pedestrians	1			1		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	147					
pX, platoon unblocked				0.84	0.86	0.84
vC, conflicting volume				1393	1825	698
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				1095	1460	271
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				100	95	100
cM capacity (veh/h)				544	105	618

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	925	468	289	578	5
Volume Left	0	0	0	0	5
Volume Right	0	5	0	0	0
cSH	1700	1700	544	1700	105
Volume to Capacity	0.54	0.28	0.00	0.34	0.05
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.1
Control Delay (s)	0.0	0.0	0.0	0.0	41.0
Lane LOS	E				
Approach Delay (s)	0.0	0.0		41.0	
Approach LOS	E				

Intersection Summary

Average Delay	0.1				
Intersection Capacity Utilization	47.8%		ICU Level of Service		A
Analysis Period (min)	15				

Lanes, Volumes, Timings

2026 Future Background AM

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

50 Speers Road

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	5	0	0	5	0
Future Volume (vph)	0	5	0	0	5	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected						0.950
Satd. Flow (prot)	1644	0	1900	0	0	1805
Flt Permitted						0.950
Satd. Flow (perm)	1644	0	1900	0	0	1805
Link Speed (k/h)	20					
Link Distance (m)	35.0		49.5		44.5	
Travel Time (s)	6.3		8.9		8.0	
Confl. Peds. (#/hr)	8					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%					
Adj. Flow (vph)	0	6	0	0	6	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	0	0	0	0	6
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6					
Link Offset(m)	0.0					
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	14		24	
Sign Control	Stop		Free		Free	

Intersection Summary

Area Type: Other
 Control Type: Unsignalized
 Intersection Capacity Utilization 15.7% ICU Level of Service A
 Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis

2026 Future Background AM

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

50 Speers Road

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	5	0	0	5	0
Future Volume (Veh/h)	0	5	0	0	5	0
Sign Control	Stop		Free		Free	
Grade	0%					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	6	0	0	6	0
Pedestrians	2					
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0					1
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	14	8	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	14	8	0			
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	1005		1072		1636	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	6	0	6
Volume Left	0	0	6
Volume Right	6	0	0
cSH	1072	1700	1636
Volume to Capacity	0.01	0.00	0.00
Queue Length 95th (m)	0.1	0.0	0.1
Control Delay (s)	8.4	0.0	7.2
Lane LOS	A		A
Approach Delay (s)	8.4	0.0	7.2
Approach LOS	A		

Intersection Summary

Average Delay 7.8
 Intersection Capacity Utilization 15.7% ICU Level of Service A
 Analysis Period (min) 15

Lanes, Volumes, Timings
11: PUDO + Parking & Speers Internal Road

2026 Future Background AM
50 Speers Road

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (vph)	5	0	0	5	0	5
Future Volume (vph)	5	0	0	5	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected						
Satd. Flow (prot)	1900	0	0	1900	1644	0
Flt Permitted						
Satd. Flow (perm)	1900	0	0	1900	1644	0
Link Speed (k/h)	20			20	20	
Link Distance (m)	35.0			37.7	75.1	
Travel Time (s)	6.3			6.8	13.5	
Confl. Peds. (#/hr)				13		
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	6	0	0	6	0	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	0	0	6	6	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	13.3%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
11: PUDO + Parking & Speers Internal Road

2026 Future Background AM
50 Speers Road

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (veh/h)	5	0	0	5	0	5
Future Volume (Veh/h)	5	0	0	5	0	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	6	0	0	6	0	6
Pedestrians	13			2		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	1			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			6			8
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			6			8
tC, single (s)			4.1			6.2
tC, 2 stage (s)						
tF (s)			2.2			3.3
p0 queue free %			100			99
cM capacity (veh/h)			1628			1078

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	6	6	6
Volume Left	0	0	0
Volume Right	0	0	6
cSH	1700	1628	1078
Volume to Capacity	0.00	0.00	0.01
Queue Length 95th (m)	0.0	0.0	0.1
Control Delay (s)	0.0	0.0	8.4
Lane LOS	A		
Approach Delay (s)	0.0	0.0	8.4
Approach LOS	A		

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
12: Underground & Speers Internal Road

2026 Future Background AM
50 Speers Road

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (vph)	10	0	0	0	5	5
Future Volume (vph)	10	0	0	0	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt					0.932	
Flt Protected					0.976	
Satd. Flow (prot)	1900	0	0	1900	1728	0
Flt Permitted					0.976	
Satd. Flow (perm)	1900	0	0	1900	1728	0
Link Speed (k/h)	20			20	20	
Link Distance (m)	37.7			38.9	38.9	
Travel Time (s)	6.8			7.0	7.0	
Confl. Peds. (#/hr)					10	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	13	0	0	0	6	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	13	0	0	0	12	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	13.3%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
12: Underground & Speers Internal Road

2026 Future Background AM
50 Speers Road

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (veh/h)	10	0	0	0	5	5
Future Volume (Veh/h)	10	0	0	0	5	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	13	0	0	0	6	6
Pedestrians	10			3		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	1			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			13		23	16
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			13		23	16
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1619		989	1066
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	13	0	12			
Volume Left	0	0	6			
Volume Right	0	0	6			
cSH	1700	1700	1026			
Volume to Capacity	0.01	0.00	0.01			
Queue Length 95th (m)	0.0	0.0	0.3			
Control Delay (s)	0.0	0.0	8.5			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	8.5			
Approach LOS			A			
Intersection Summary						
Average Delay			4.1			
Intersection Capacity Utilization	13.3%		ICU Level of Service		A	
Analysis Period (min)	15					

Lanes, Volumes, Timings 2026 Future Background AM
 13: PUDO Exit/Speers Internal Road 2 & Speers Internal Road/30 Speers 50 Speers Road

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	15	0	0	0	0	20	0	5	0	5	0	0
Future Volume (vph)	15	0	0	0	0	20	0	5	0	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.865											
Fit Protected	0.950											
Satd. Flow (prot)	0	1504	0	0	1644	0	0	1900	0	0	1805	0
Fit Permitted	0.950											
Satd. Flow (perm)	0	1504	0	0	1644	0	0	1900	0	0	1805	0
Link Speed (k/h)	20		20		20		20		20		20	
Link Distance (m)	38.9		43.4		75.5		49.2					
Travel Time (s)	7.0		7.8		13.6		8.9					
Confl. Peds. (#/hr)	2		8	8		2		7	7			
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Heavy Vehicles (%)	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%
Adj. Flow (vph)	24	0	0	0	0	32	0	8	0	8	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	24	0	0	32	0	0	8	0	0	8	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6		1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control	Stop		Stop		Free		Free					
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	20.9%		ICU Level of Service A									
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis 2026 Future Background AM
 13: PUDO Exit/Speers Internal Road 2 & Speers Internal Road/30 Speers 50 Speers Road

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	15	0	0	0	0	20	0	5	0	5	0	0
Future Volume (Veh/h)	15	0	0	0	0	20	0	5	0	5	0	0
Sign Control	Stop		Stop		Free		Free					
Grade	0%		0%		0%		0%					
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Hourly flow rate (vph)	24	0	0	0	0	32	0	8	0	8	0	0
Pedestrians	3		7		8		3					
Lane Width (m)	3.6		3.6		3.6		3.6					
Walking Speed (m/s)	1.1		1.1		1.1		1.1					
Percent Blockage	0		1		1		0					
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	62	34	11	39	34	18	3			15		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	62	34	11	39	34	18	3			15		
tC, single (s)	7.3	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	100	100	100	97	100			100		
cM capacity (veh/h)	849	850	1065	947	850	1057	1628			1606		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	24	32	8	8								
Volume Left	24	0	0	8								
Volume Right	0	32	0	0								
cSH	849	1057	1628	1606								
Volume to Capacity	0.03	0.03	0.00	0.00								
Queue Length 95th (m)	0.7	0.7	0.0	0.1								
Control Delay (s)	9.4	8.5	0.0	7.3								
Lane LOS	A	A		A								
Approach Delay (s)	9.4	8.5	0.0	7.3								
Approach LOS	A	A										
Intersection Summary												
Average Delay	7.7											
Intersection Capacity Utilization	20.9%		ICU Level of Service A									
Analysis Period (min)	15											

Lanes, Volumes, Timings

2026 Future Background AM

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

50 Speers Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (vph)	0	1360	0	5	840	0	10	0	30	0	0	0
Future Volume (vph)	0	1360	0	5	840	0	10	0	30	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.900											
Flt Protected	0.987											
Satd. Flow (prot)	0	3539	0	0	3540	0	0	1688	0	0	1863	0
Flt Permitted	0.987											
Satd. Flow (perm)	0	3539	0	0	3540	0	0	1688	0	0	1863	0
Link Speed (k/h)	60											
Link Distance (m)	113.4			233.1			49.2			39.0		
Travel Time (s)	6.8			14.0			8.9			7.0		
Confl. Peds. (#/hr)	8			8								
Confl. Bikes (#/hr)	1											
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	2%	0%	2%	2%	2%
Adj. Flow (vph)	0	1432	0	5	884	0	11	0	32	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1432	0	0	889	0	0	43	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Left	Left	Right	Left	Left	Right	Right
Median Width(m)	3.6			3.6			0.0			0.0		
Link Offset(m)	0.0											
Crosswalk Width(m)	1.6			1.6			1.6			1.6		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14		24		14		24		14	
Sign Control	Free			Free			Stop			Stop		

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	47.6%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

2026 Future Background AM

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

50 Speers Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (veh/h)	0	1360	0	5	840	0	10	0	30	0	0	0
Future Volume (Veh/h)	0	1360	0	5	840	0	10	0	30	0	0	0
Sign Control	Free			Free			Stop			Stop		
Grade	0%											
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Hourly flow rate (vph)	0	1432	0	5	884	0	11	0	32	0	0	0
Pedestrians	4											
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	0											
Right turn flare (veh)	1											
Median type	None											
Median storage (veh)												
Upstream signal (m)	261			233								
pX, platoon unblocked	0.95			0.85			0.88			0.88		
vC, conflicting volume	884			1440			1896			2334		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	774			1172			1490			1988		
tC, single (s)	4.1			4.1			7.5			6.5		
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5			4.0		
p0 queue free %	100			99			85			100		
cM capacity (veh/h)	796			511			75			52		
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	955	477	300	589	43	0						
Volume Left	0	0	5	0	11	0						
Volume Right	0	0	0	0	32	0						
cSH	1700	1700	511	1700	211	1700						
Volume to Capacity	0.56	0.28	0.01	0.35	0.20	0.00						
Queue Length 95th (m)	0.0	0.0	0.2	0.0	5.6	0.0						
Control Delay (s)	0.0	0.0	0.3	0.0	26.4	0.0						
Lane LOS	A			D			A			A		
Approach Delay (s)	0.0			0.1			26.4			0.0		
Approach LOS	D			A								
Intersection Summary												
Average Delay	0.5											
Intersection Capacity Utilization	47.6%			ICU Level of Service			A					
Analysis Period (min)	15											

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

2026 Future Background PM
50 Speers Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	65	575	135	295	815	505	140	155	230	280	285	60
Future Volume (vph)	65	575	135	295	815	505	140	155	230	280	285	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	105.0		0.0	75.0		100.0	50.0		45.0	0.0		0.0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99		1.00		0.94	0.97		0.93	0.96		0.99
Frt		0.971				0.850			0.850		0.974	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3427	0	1752	3539	1583	1787	1900	1599	1787	1828	0
Flt Permitted	0.280			0.249			0.279			0.501		
Satd. Flow (perm)	527	3427	0	458	3539	1485	511	1900	1486	903	1828	0
Right Turn on Red			Yes			Yes		Yes				Yes
Satd. Flow (RTOR)		28				532			242		9	
Link Speed (kh)		60			60			50			50	
Link Distance (m)		235.8			147.2			127.4			167.2	
Travel Time (s)		14.1			8.8			9.2			12.0	
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	3%	2%	1%	0%	1%	1%	1%	0%	0%
Adj. Flow (vph)	68	605	142	311	858	532	147	163	242	295	300	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	68	747	0	311	858	532	147	163	242	295	363	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

2026 Future Background PM
50 Speers Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2		2	4		4	8		
Detector Phase	1	6		5	2	2	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	7.0	25.0		7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0	
Minimum Split (s)	10.0	30.9		10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3	
Total Split (s)	12.0	54.0		12.0	54.0	54.0	12.0	38.0	38.0	16.0	42.0	
Total Split (%)	10.0%	45.0%		10.0%	45.0%	45.0%	10.0%	31.7%	31.7%	13.3%	35.0%	
Maximum Green (s)	9.0	48.1		9.0	48.1	48.1	9.0	31.7	31.7	13.0	35.7	
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	
All-Red Time (s)	0.0	2.2		0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	5.5		2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	
Walk Time (s)		7.0			7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		14.0			14.0	14.0		14.0	14.0		14.0	
Pedestrian Calls (#/hr)		15			15	15		35	35		35	
Act Effect Green (s)	59.8	49.3		68.5	57.6	57.6	36.7	23.8	23.8	44.9	28.9	
Actuated g/C Ratio	0.50	0.41		0.57	0.48	0.48	0.31	0.20	0.20	0.37	0.24	
v/c Ratio	0.20	0.52		0.76	0.51	0.54	0.57	0.43	0.50	0.66	0.81	
Control Delay	14.5	27.7		30.5	24.5	4.2	34.0	44.4	8.1	35.5	56.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	14.5	27.7		30.5	24.5	4.2	34.0	44.4	8.1	35.5	56.1	
LOS	B	C		C	C	A	C	D	A	D	E	
Approach Delay		26.6			19.2			25.7			46.9	
Approach LOS		C			B			C			D	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 49 (41%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 26.7

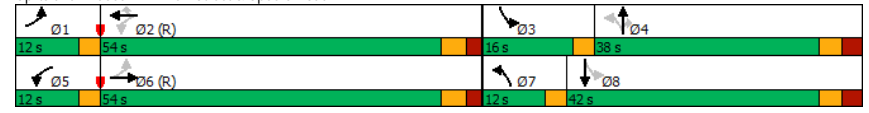
Intersection LOS: C

Intersection Capacity Utilization 84.2%

ICU Level of Service E

Analysis Period (min) 15

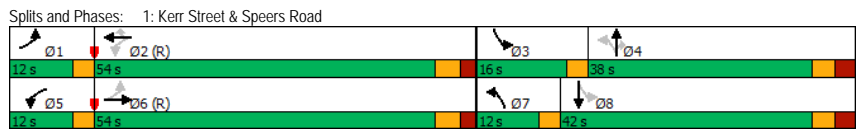
Splits and Phases: 1: Kerr Street & Speers Road



Timings 2026 Future Background PM
 1: Kerr Street & Speers Road 50 Speers Road

	↖	→	↙	←	↘	↖	↙	↘	↖	↙	↘	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT		
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖		↖
Traffic Volume (vph)	65	575	295	815	505	140	155	230	280	285		
Future Volume (vph)	65	575	295	815	505	140	155	230	280	285		
Turn Type	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		
Protected Phases	1	6	5	2		7	4		3	8		
Permitted Phases	6	2	2	4	4	4	8					
Detector Phase	1	6	5	2	2	7	4	4	3	8		
Switch Phase												
Minimum Initial (s)	7.0	25.0	7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0		
Minimum Split (s)	10.0	30.9	10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3		
Total Split (s)	12.0	54.0	12.0	54.0	54.0	12.0	38.0	38.0	16.0	42.0		
Total Split (%)	10.0%	45.0%	10.0%	45.0%	45.0%	10.0%	31.7%	31.7%	13.3%	35.0%		
Maximum Green (s)	9.0	48.1	9.0	48.1	48.1	9.0	31.7	31.7	13.0	35.7		
Yellow Time (s)	3.0	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3		
All-Red Time (s)	0.0	2.2	0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	3.0	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3		
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Vehicle Extension (s)	2.5	5.5	2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0		
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Recall Mode	None	C-Min	None	C-Min	C-Min	None	None	None	None	None		
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		
Flash Dont Walk (s)	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0		
Pedestrian Calls (#/hr)		15		15	15		35	35		35		

Intersection Summary
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 49 (41%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated



Queues 2026 Future Background PM
 1: Kerr Street & Speers Road 50 Speers Road

	↖	→	↙	←	↘	↖	↙	↘	↖	↙	↘	↓
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT		
Lane Group Flow (vph)	68	747	311	858	532	147	163	242	295	363		
v/c Ratio	0.20	0.52	0.76	0.51	0.54	0.57	0.43	0.50	0.66	0.81		
Control Delay	14.5	27.7	30.5	24.5	4.2	34.0	44.4	8.1	35.5	56.1		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	14.5	27.7	30.5	24.5	4.2	34.0	44.4	8.1	35.5	56.1		
Queue Length 50th (m)	7.1	71.4	37.9	75.9	0.0	22.6	33.9	0.0	49.7	78.7		
Queue Length 95th (m)	14.9	85.5	#89.0	103.5	21.7	35.1	50.0	19.1	69.7	106.1		
Internal Link Dist (m)		211.8		123.2			103.4			143.2		
Turn Bay Length (m)	105.0		75.0		100.0	50.0		45.0				
Base Capacity (vph)	364	1450	411	1699	989	261	501	570	447	550		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.19	0.52	0.76	0.51	0.54	0.56	0.33	0.42	0.66	0.66		

Intersection Summary
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
1: Kerr Street & Speers Road

2026 Future Background PM
50 Speers Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	65	575	135	295	815	505	140	155	230	280	285	60
Future Volume (vph)	65	575	135	295	815	505	140	155	230	280	285	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	0.99		1.00	1.00	0.94	1.00	1.00	0.93	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	0.98	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1799	3429		1751	3539	1485	1776	1900	1486	1753	1828	
Flt Permitted	0.28	1.00		0.25	1.00	1.00	0.28	1.00	1.00	0.50	1.00	
Satd. Flow (perm)	530	3429		460	3539	1485	521	1900	1486	924	1828	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	68	605	142	311	858	532	147	163	242	295	300	63
RTOR Reduction (vph)	0	16	0	0	0	279	0	0	194	0	7	0
Lane Group Flow (vph)	68	731	0	311	858	253	147	163	48	295	356	0
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2		2	4		4	8		
Actuated Green, G (s)	55.5	49.3		66.2	57.0	57.0	33.5	23.8	23.8	41.6	28.9	
Effective Green, g (s)	55.5	49.3		66.2	57.0	57.0	33.5	23.8	23.8	41.6	28.9	
Actuated g/C Ratio	0.46	0.41		0.55	0.48	0.48	0.28	0.20	0.20	0.35	0.24	
Clearance Time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Vehicle Extension (s)	2.5	5.5		2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	
Lane Grp Cap (vph)	310	1408		403	1681	705	246	376	294	422	440	
v/s Ratio Prot	0.01	0.21		c0.09	0.24		0.05	0.09		c0.09	c0.19	
v/s Ratio Perm	0.09			c0.34		0.17	0.12		0.03	0.16		
v/c Ratio	0.22	0.52		0.77	0.51	0.36	0.60	0.43	0.16	0.70	0.81	
Uniform Delay, d1	18.3	26.5		16.9	21.8	19.9	34.6	42.2	39.9	31.4	43.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	1.4		8.5	1.1	1.4	3.2	1.1	0.4	4.6	11.1	
Delay (s)	18.5	27.8		25.4	22.9	21.4	37.9	43.3	40.2	36.0	54.0	
Level of Service	B	C		C	C	C	D	D	D	D	D	
Approach Delay (s)		27.1			22.9			40.5			46.0	
Approach LOS		C			C			D			D	

Intersection Summary		
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.81	
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	84.2%	ICU Level of Service
Analysis Period (min)	15	

c Critical Lane Group

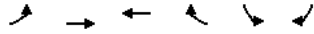
Lanes, Volumes, Timings
2: Speers Road & Cross Avenue

2026 Future Background PM
50 Speers Road

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕	↕	↕	↔	↔
Traffic Volume (vph)	260	815	1190	15	10	420
Future Volume (vph)	260	815	1190	15	10	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	80.0			0.0	45.0	0.0
Storage Lanes	1			0	1	2
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	0.88
Ped Bike Factor	1.00		1.00			
Frt			0.998			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1703	3610	3566	0	1805	2733
Flt Permitted	0.154				0.950	
Satd. Flow (perm)	276	3610	3566	0	1805	2733
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			1			321
Link Speed (k/h)		60	60		48	
Link Distance (m)		233.1	101.5		84.0	
Travel Time (s)		14.0	6.1		6.3	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Adj. Flow (vph)	271	849	1240	16	10	438
Shared Lane Traffic (%)						
Lane Group Flow (vph)	271	849	1256	0	10	438
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
2: Speers Road & Cross Avenue

2026 Future Background PM
50 Speers Road



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	pm+pt	NA	NA	Prot	Perm	
Protected Phases	5	2	6	4		
Permitted Phases	2				4	
Detector Phase	5	2	6	4	4	
Switch Phase						
Minimum Initial (s)	6.0	38.0	38.0	10.0	10.0	
Minimum Split (s)	12.0	47.6	47.6	15.8	15.8	
Total Split (s)	17.0	102.0	85.0	38.0	38.0	
Total Split (%)	12.1%	72.9%	60.7%	27.1%	27.1%	
Maximum Green (s)	11.0	95.4	78.4	32.2	32.2	
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3	
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.5	5.0	5.0	3.0	3.0	
Recall Mode	None	C-Min	C-Min	None	None	
Walk Time (s)		10.0	10.0			
Flash Dont Walk (s)		31.0	31.0			
Pedestrian Calls (#/hr)		5	5			
Act Effect Green (s)	114.6	114.0	88.9	13.6	13.6	
Actuated g/C Ratio	0.82	0.81	0.64	0.10	0.10	
v/c Ratio	0.64	0.29	0.55	0.06	0.79	
Control Delay	15.9	3.7	16.6	55.2	27.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	15.9	3.7	16.6	55.2	27.3	
LOS	B	A	B	E	C	
Approach Delay		6.6	16.6	27.9		
Approach LOS		A	B	C		

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 13 (9%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 14.4
 Intersection Capacity Utilization 72.2%
 Analysis Period (min) 15
 Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 2: Speers Road & Cross Avenue



Timings
2: Speers Road & Cross Avenue

2026 Future Background PM
50 Speers Road



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↕↕	↕↕	↔	↕↕
Traffic Volume (vph)	260	815	1190	10	420
Future Volume (vph)	260	815	1190	10	420
Turn Type	pm+pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2				4
Detector Phase	5	2	6	4	4
Switch Phase					
Minimum Initial (s)	6.0	38.0	38.0	10.0	10.0
Minimum Split (s)	12.0	47.6	47.6	15.8	15.8
Total Split (s)	17.0	102.0	85.0	38.0	38.0
Total Split (%)	12.1%	72.9%	60.7%	27.1%	27.1%
Maximum Green (s)	11.0	95.4	78.4	32.2	32.2
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Vehicle Extension (s)	3.5	5.0	5.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Min	C-Min	None	None
Walk Time (s)		10.0	10.0		
Flash Dont Walk (s)		31.0	31.0		
Pedestrian Calls (#/hr)		5	5		

Intersection Summary

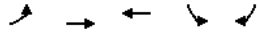
Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 13 (9%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated

Splits and Phases: 2: Speers Road & Cross Avenue



Queues
2: Speers Road & Cross Avenue

2026 Future Background PM
50 Speers Road

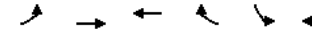


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	271	849	1256	10	438
w/c Ratio	0.64	0.29	0.55	0.06	0.79
Control Delay	15.9	3.7	16.6	55.2	27.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	15.9	3.7	16.6	55.2	27.3
Queue Length 50th (m)	12.3	23.0	92.0	2.6	17.8
Queue Length 95th (m)	46.1	39.7	145.1	7.8	36.6
Internal Link Dist (m)		209.1	77.5	60.0	
Turn Bay Length (m)	80.0		45.0		
Base Capacity (vph)	421	2940	2270	415	875
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.64	0.29	0.55	0.02	0.50

Intersection Summary

HCM Signalized Intersection Capacity Analysis
2: Speers Road & Cross Avenue

2026 Future Background PM
50 Speers Road



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔↔	↔↔		↔	↔↔
Traffic Volume (vph)	260	815	1190	15	10	420
Future Volume (vph)	260	815	1190	15	10	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.6	6.6		5.8	5.8
Lane Util. Factor	1.00	0.95	0.95		1.00	0.88
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Fr	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1703	3610	3567		1805	2733
Flt Permitted	0.15	1.00	1.00		0.95	1.00
Satd. Flow (perm)	276	3610	3567		1805	2733
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	271	849	1240	16	10	438
RTOR Reduction (vph)	0	0	0	0	0	290
Lane Group Flow (vph)	271	849	1256	0	10	148
Confl. Peds. (#/hr)	5			5		
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	114.0	114.0	88.9		13.6	13.6
Effective Green, g (s)	114.0	114.0	88.9		13.6	13.6
Actuated g/C Ratio	0.81	0.81	0.64		0.10	0.10
Clearance Time (s)	6.0	6.6	6.6		5.8	5.8
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Lane Grp Cap (vph)	419	2939	2265		175	265
v/s Ratio Prot	c0.09	0.24	0.35		0.01	
v/s Ratio Perm	c0.44					c0.05
w/c Ratio	0.65	0.29	0.55		0.06	0.56
Uniform Delay, d1	12.3	3.2	14.4		57.4	60.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.6	0.2	1.0		0.1	2.6
Delay (s)	15.9	3.4	15.4		57.5	62.9
Level of Service	B	A	B		E	E
Approach Delay (s)		6.4	15.4		62.8	
Approach LOS		A	B		E	

Intersection Summary

HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
3: St. Augustine Drive & Speers Road

2026 Future Background PM
50 Speers Road

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔			↔↔				↔		↔↔	
Traffic Volume (vph)	10	740	25	0	995	25	5	0	25	5	0	0
Future Volume (vph)	10	740	25	0	995	25	5	0	25	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		1	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995			0.996				0.865			
Flt Protected	0.950						0.950				0.950	
Satd. Flow (prot)	1805	3553	0	0	3561	0	0	0	1644	0	1805	0
Flt Permitted	0.950						0.950				0.950	
Satd. Flow (perm)	1805	3553	0	0	3561	0	0	0	1644	0	1805	0
Link Speed (k/h)		60			60				40			30
Link Distance (m)		248.1			235.8				188.1			117.6
Travel Time (s)		14.9			14.1				16.9			14.1
Confl. Peds. (#/hr)	8		5	5		8	1		1	1		1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	10	771	26	0	1036	26	5	0	26	5	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	797	0	0	1062	0	0	5	26	0	5	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6				0.0			0.0
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		1.6			1.6				1.6			1.6
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free				Stop			Stop

Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization Err%	ICU Level of Service H											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
3: St. Augustine Drive & Speers Road

2026 Future Background PM
50 Speers Road

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	↔	↔↔			↔↔				↔		↔↔	
Lane Configurations	↔	↔↔			↔↔				↔		↔↔	
Traffic Volume (veh/h)	10	740	25	0	995	25	5	0	25	5	0	0
Future Volume (Veh/h)	10	740	25	0	995	25	5	0	25	5	0	0
Sign Control	Free				Free		Stop			Stop		
Grade	0%				0%		0%			0%		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	10	771	26	0	1036	26	5	0	26	5	0	0
Pedestrians	1				1		5			8		
Lane Width (m)	3.6				3.6		3.6			3.6		
Walking Speed (m/s)	1.1				1.1		1.1			1.1		
Percent Blockage	0				0		0			1		
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (m)	236											
pX, platoon unblocked	0.83						0.83	0.83		0.83	0.83	0.83
vC, conflicting volume	1070			802			1328	1879	404	1490	1879	540
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	681			802			991	1653	404	1185	1653	44
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			97	100	96	96	100	100
cM capacity (veh/h)	761			827			165	81	598	114	81	844
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1					
Volume Total	10	514	283	691	371	31	5					
Volume Left	10	0	0	0	0	5	5					
Volume Right	0	0	26	0	26	26	0					
cSH	761	1700	1700	1700	1700	420	114					
Volume to Capacity	0.01	0.30	0.17	0.41	0.22	0.07	0.04					
Queue Length 95th (m)	0.3	0.0	0.0	0.0	0.0	1.8	1.0					
Control Delay (s)	9.8	0.0	0.0	0.0	0.0	14.2	38.1					
Lane LOS	A				B		E					
Approach Delay (s)	0.1			0.0	14.2		38.1					
Approach LOS	B			E								
Intersection Summary												
Average Delay	0.4											
Intersection Capacity Utilization	Err%		ICU Level of Service		H							
Analysis Period (min)	15											

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

2026 Future Background PM
50 Speers Road

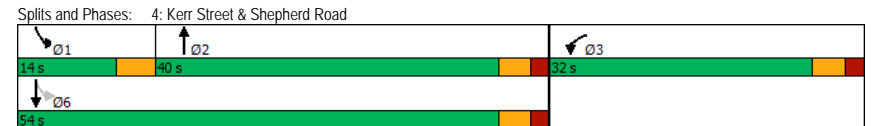
	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖		↕			↘
Traffic Volume (vph)	95	150	595	125	170	530
Future Volume (vph)	95	150	595	125	170	530
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor	0.98		1.00			1.00
Frt	0.917		0.974			
Flt Protected	0.981					0.988
Satd. Flow (prot)	1661	0	3459	0	0	3540
Flt Permitted	0.981					0.647
Satd. Flow (perm)	1653	0	3459	0	0	2317
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	96		35			
Link Speed (kh)	50		50			50
Link Distance (m)	265.3		167.2			26.5
Travel Time (s)	19.1		12.0			1.9
Confl. Peds. (#/hr)	13	6		4	4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	1%	1%	2%	0%	1%
Adj. Flow (vph)	98	155	613	129	175	546
Shared Lane Traffic (%)						
Lane Group Flow (vph)	253	0	742	0	0	721
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (kh)	24	14		14	24	
Number of Detectors	1		2		1	2
Detector Template	Left		Thru		Left	Thru
Leading Detector (m)	2.0		10.0		2.0	10.0
Trailing Detector (m)	0.0		0.0		0.0	0.0
Detector 1 Position(m)	0.0		0.0		0.0	0.0
Detector 1 Size(m)	2.0		0.6		2.0	0.6
Detector 1 Type	CI+Ex		CI+Ex		CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0		0.0	0.0
Detector 1 Queue (s)	0.0		0.0		0.0	0.0
Detector 1 Delay (s)	0.0		0.0		0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			CI+Ex			CI+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases					6	

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

2026 Future Background PM
50 Speers Road

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	3		2		1	6
Switch Phase						
Minimum Initial (s)	10.0		18.0		7.0	18.0
Minimum Split (s)	31.4		28.2		11.0	28.2
Total Split (s)	32.0		40.0		14.0	54.0
Total Split (%)	37.2%		46.5%		16.3%	62.8%
Maximum Green (s)	26.6		34.8		10.0	48.8
Yellow Time (s)	3.3		3.3		4.0	3.3
All-Red Time (s)	2.1		1.9		0.0	1.9
Lost Time Adjust (s)	0.0		0.0			0.0
Total Lost Time (s)	5.4		5.2			5.2
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.5		2.5	3.5
Recall Mode	None		Min		None	Min
Walk Time (s)	10.0		10.0			10.0
Flash Dont Walk (s)	16.0		13.0			13.0
Pedestrian Calls (#/hr)	0		5			5
Act Effect Green (s)	12.1		23.7			23.7
Actuated g/C Ratio	0.26		0.51			0.51
v/c Ratio	0.50		0.42			0.62
Control Delay	14.5		7.7			11.0
Queue Delay	0.0		0.0			0.0
Total Delay	14.5		7.7			11.0
LOS	B		A			B
Approach Delay	14.5		7.7			11.0
Approach LOS	B		A			B

Intersection Summary	
Area Type:	Other
Cycle Length:	86
Actuated Cycle Length:	46.9
Natural Cycle:	75
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.62
Intersection Signal Delay:	10.1
Intersection Capacity Utilization:	69.4%
Intersection LOS:	B
ICU Level of Service:	C
Analysis Period (min):	15



Timings
4: Kerr Street & Shepherd Road

2026 Future Background PM
50 Speers Road

	↙	↑	↘	↓
Lane Group	WBL	NBT	SBL	SBT
Lane Configurations	↘↘	↑↑		↙↙
Traffic Volume (vph)	95	595	170	530
Future Volume (vph)	95	595	170	530
Turn Type	Prot	NA	pm+pt	NA
Protected Phases	3	2	1	6
Permitted Phases			6	
Detector Phase	3	2	1	6
Switch Phase				
Minimum Initial (s)	10.0	18.0	7.0	18.0
Minimum Split (s)	31.4	28.2	11.0	28.2
Total Split (s)	32.0	40.0	14.0	54.0
Total Split (%)	37.2%	46.5%	16.3%	62.8%
Maximum Green (s)	26.6	34.8	10.0	48.8
Yellow Time (s)	3.3	3.3	4.0	3.3
All-Red Time (s)	2.1	1.9	0.0	1.9
Lost Time Adjust (s)	0.0	0.0		0.0
Total Lost Time (s)	5.4	5.2		5.2
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Vehicle Extension (s)	3.0	3.5	2.5	3.5
Minimum Gap (s)	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0
Recall Mode	None	Min	None	Min
Walk Time (s)	10.0	10.0		10.0
Flash Dont Walk (s)	16.0	13.0		13.0
Pedestrian Calls (#/hr)	0	5		5

Intersection Summary

Cycle Length: 86
Actuated Cycle Length: 46.9
Natural Cycle: 75
Control Type: Semi Act-Uncoord

Splits and Phases: 4: Kerr Street & Shepherd Road



Queues
4: Kerr Street & Shepherd Road

2026 Future Background PM
50 Speers Road

	↙	↑	↓
Lane Group	WBL	NBT	SBT
Lane Group Flow (vph)	253	742	721
v/c Ratio	0.50	0.42	0.62
Control Delay	14.5	7.7	11.0
Queue Delay	0.0	0.0	0.0
Total Delay	14.5	7.7	11.0
Queue Length 50th (m)	9.4	14.4	17.1
Queue Length 95th (m)	33.5	32.3	40.2
Internal Link Dist (m)	241.3	143.2	2.5
Turn Bay Length (m)			
Base Capacity (vph)	1020	2697	2187
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.25	0.28	0.33

Intersection Summary

HCM Signalized Intersection Capacity Analysis
4: Kerr Street & Shepherd Road

2026 Future Background PM
50 Speers Road

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	95	150	595	125	170	530
Future Volume (vph)	95	150	595	125	170	530
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4		5.2			5.2
Lane Util. Factor	1.00		0.95			0.95
Frb, ped/bikes	0.99		1.00			1.00
Flpb, ped/bikes	1.00		1.00			1.00
Frt	0.92		0.97			1.00
Flt Protected	0.98		1.00			0.99
Satd. Flow (prot)	1664		3461			3539
Flt Permitted	0.98		1.00			0.65
Satd. Flow (perm)	1664		3461			2317
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	98	155	613	129	175	546
RTOR Reduction (vph)	71	0	17	0	0	0
Lane Group Flow (vph)	182	0	725	0	0	721
Confl. Peds. (#/hr)	13	6		4	4	
Heavy Vehicles (%)	3%	1%	1%	2%	0%	1%
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases					6	
Actuated Green, G (s)	12.1		23.7			23.7
Effective Green, g (s)	12.1		23.7			23.7
Actuated g/C Ratio	0.26		0.51			0.51
Clearance Time (s)	5.4		5.2			5.2
Vehicle Extension (s)	3.0		3.5			3.5
Lane Grp Cap (vph)	433		1767			1183
v/s Ratio Prot	c0.11		0.21			
v/s Ratio Perm						c0.31
v/c Ratio	0.42		0.41			0.61
Uniform Delay, d1	14.2		7.0			8.1
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	0.7		0.2			0.9
Delay (s)	14.9		7.2			9.0
Level of Service	B		A			A
Approach Delay (s)	14.9		7.2			9.0
Approach LOS	B		A			A
Intersection Summary						
HCM 2000 Control Delay		9.1		HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio		0.61				
Actuated Cycle Length (s)		46.4		Sum of lost time (s)		14.6
Intersection Capacity Utilization		69.4%		ICU Level of Service		C
Analysis Period (min)		15				

Lanes, Volumes, Timings
5: Kerr Street & Wyecroft Road

2026 Future Background PM
50 Speers Road

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	25	130	115	630	570	110
Future Volume (vph)	25	130	115	630	570	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	75.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.887				0.978	
Flt Protected	0.992		0.950			
Satd. Flow (prot)	1618	0	1703	1900	1846	0
Flt Permitted	0.992		0.950			
Satd. Flow (perm)	1618	0	1703	1900	1846	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	561.6			442.6	98.1	
Travel Time (s)	40.4			31.9	7.1	
Confl. Peds. (#/hr)			5			5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	4%	6%	0%	0%	4%
Adj. Flow (vph)	27	138	122	670	606	117
Shared Lane Traffic (%)						
Lane Group Flow (vph)	165	0	122	670	723	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	62.5%			ICU Level of Service B		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
5: Kerr Street & Wycroft Road

2026 Future Background PM
50 Speers Road

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔		↔	
Traffic Volume (veh/h)	25	130	115	630	570	110
Future Volume (Veh/h)	25	130	115	630	570	110
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	27	138	122	670	606	117
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1584	670	728			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1584	670	728			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	74	69	86			
cM capacity (veh/h)	103	452	854			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	165	122	670	723		
Volume Left	27	122	0			
Volume Right	138	0	0	117		
cSH	291	854	1700	1700		
Volume to Capacity	0.57	0.14	0.39	0.43		
Queue Length 95th (m)	24.8	3.8	0.0			
Control Delay (s)	32.5	9.9	0.0			
Lane LOS	D	A				
Approach Delay (s)	32.5	1.5	0.0			
Approach LOS	D					
Intersection Summary						
Average Delay			3.9			
Intersection Capacity Utilization			62.5%		ICU Level of Service B	
Analysis Period (min)	15					

Lanes, Volumes, Timings
6: Kerr Street & Prince Charles Drive

2026 Future Background PM
50 Speers Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔		↔		↔		↔		↔		↔		
Traffic Volume (vph)	10	0	10	10	0	30	5	490	10	20	665	25	
Future Volume (vph)	10	0	10	10	0	30	5	490	10	20	665	25	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt	0.932		0.900		0.997		0.995						
Flt Protected	0.976		0.987		0.999								
Satd. Flow (prot)	0	1728	0	0	1688	0	0	1873	0	0	1849	0	
Flt Permitted	0.976		0.987		0.999								
Satd. Flow (perm)	0	1728	0	0	1688	0	0	1873	0	0	1849	0	
Link Speed (k/h)	40		40		50		50						
Link Distance (m)	57.8		56.0		134.8		127.4						
Travel Time (s)	5.2		5.0		9.7		9.2						
Confl. Peds. (#/hr)	4	1		1		4	21	31		31		21	
Confl. Bikes (#/hr)									1	1			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Heavy Vehicles (%)	0%	50%	0%	0%	0%	0%	20%	1%	0%	5%	2%	4%	
Adj. Flow (vph)	11	0	11	11	0	32	5	516	11	21	700	26	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	22	0	0	43	0	0	532	0	0	747	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)	0.0		0.0		0.0		0.0		3.6				
Link Offset(m)	0.0		0.0		0.0		0.0		0.0				
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6				
Two way Left Turn Lane													
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (k/h)	24	14		24		14		24		14		24	
Sign Control	Stop		Stop		Free		Free		Free				
Intersection Summary													
Area Type:	Other												
Control Type:	Unsignalized												
Intersection Capacity Utilization	60.4%						ICU Level of Service B						
Analysis Period (min)	15												

HCM Unsignalized Intersection Capacity Analysis
6: Kerr Street & Prince Charles Drive

2026 Future Background PM
50 Speers Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	10	0	10	10	0	30	5	490	10	20	665	25
Future Volume (Veh/h)	10	0	10	10	0	30	5	490	10	20	665	25
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	0	11	11	0	32	5	516	11	21	700	26
Pedestrians	21			31			1			4		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	2			3			0			0		
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (m)							238			127		
pX, platoon unblocked	0.74	0.74	0.72	0.74	0.74	0.95	0.72				0.95	
vC, conflicting volume	1344	1344	735	1330	1352	556	747				558	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1127	1128	433	1108	1138	503	450				505	
tC, single (s)	7.1	7.0	6.2	7.1	6.5	6.2	4.3				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.5	3.3	3.5	4.0	3.3	2.4				2.2	
p0 queue free %	91	100	98	91	100	94	99				98	
cM capacity (veh/h)	118	115	441	125	140	525	719				961	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	22	43	532	747								
Volume Left	11	11	5	21								
Volume Right	11	32	11	26								
cSH	186	289	719	961								
Volume to Capacity	0.12	0.15	0.01	0.02								
Queue Length 95th (m)	3.0	3.9	0.2	0.5								
Control Delay (s)	26.9	19.6	0.2	0.6								
Lane LOS	D	C	A	A								
Approach Delay (s)	26.9	19.6	0.2	0.6								
Approach LOS	D	C										
Intersection Summary												
Average Delay	1.5											
Intersection Capacity Utilization	60.4%			ICU Level of Service	B							
Analysis Period (min)	15											

Lanes, Volumes, Timings
7: Kerr Street & Elmwood Road

2026 Future Background PM
50 Speers Road

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	15	10	5	490	645	40
Future Volume (vph)	15	10	5	490	645	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.945				0.992	
Fit Protected	0.971					
Satd. Flow (prot)	1675	0	0	1860	1843	0
Fit Permitted	0.971					
Satd. Flow (perm)	1675	0	0	1860	1843	0
Link Speed (k/h)	40		50		50	
Link Distance (m)	171.2		103.0		134.8	
Travel Time (s)	15.4		7.4		9.7	
Confl. Peds. (#/hr)	1	2	34			34
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	10%	20%	2%	2%	7%
Adj. Flow (vph)	16	11	5	516	679	42
Shared Lane Traffic (%)						
Lane Group Flow (vph)	27	0	0	521	721	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24	14		
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	47.2%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
7: Kerr Street & Elmwood Road

2026 Future Background PM
50 Speers Road

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↕	↕	
Traffic Volume (veh/h)	15	10	5	490	645	40
Future Volume (Veh/h)	15	10	5	490	645	40
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	11	5	516	679	42
Pedestrians	34		2		1	
Lane Width (m)	3.6		3.6		3.6	
Walking Speed (m/s)	1.1		1.1		1.1	
Percent Blockage	3		0		0	
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)			103		262	
pX, platoon unblocked	0.81	0.76	0.76			
vC, conflicting volume	1261	736	755			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	957	497	522			
tC, single (s)	6.4	6.3	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.4			
p0 queue free %	93	97	99			
cM capacity (veh/h)	223	411	708			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	27	521	721			
Volume Left	16	5	0			
Volume Right	11	0	42			
cSH	274	708	1700			
Volume to Capacity	0.10	0.01	0.42			
Queue Length 95th (m)	2.5	0.2	0.0			
Control Delay (s)	19.6	0.2	0.0			
Lane LOS	C	A				
Approach Delay (s)	19.6	0.2	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			47.2%		ICU Level of Service A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
8: Kerr Street & Stewart Street

2026 Future Background PM
50 Speers Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	50	10	15	10	15	75	10	370	15	55	550	50
Future Volume (vph)	50	10	15	10	15	75	10	370	15	55	550	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.97		0.96		1.00		1.00		0.99		0.99	
Frt	0.973		0.898		0.995		0.995		0.990		0.990	
Flt Protected	0.968		0.995		0.999		0.999		0.996		0.996	
Satd. Flow (prot)	0	1705	0	0	1577	0	0	1855	0	0	1831	0
Flt Permitted	0.771		0.967		0.982		0.982		0.936		0.936	
Satd. Flow (perm)	0	1333	0	0	1530	0	0	1823	0	0	1718	0
Right Turn on Red	Yes						Yes		Yes		Yes	
Satd. Flow (RTOR)	16		82		3		8					
Link Speed (k/h)	40		40		50		50					
Link Distance (m)	95.6		60.6		165.0		103.0					
Travel Time (s)	8.6		5.5		11.9		7.4					
Confl. Peds. (#/hr)	20		15	15		20	35		25	25		35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Adj. Flow (vph)	54	11	16	11	16	82	11	402	16	60	598	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	81	0	0	109	0	0	429	0	0	712	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6		1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases	4		8		8		2		2		1 6	
Permitted Phases	4		8		8		2		2		6	

Lanes, Volumes, Timings
8: Kerr Street & Stewart Street

2026 Future Background PM
50 Speers Road

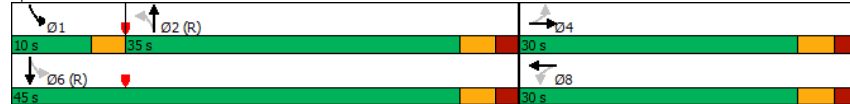


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		24.0	24.0		6.0	24.0	
Minimum Split (s)	30.0	30.0		30.0	30.0		32.0	32.0		10.0	32.0	
Total Split (s)	30.0	30.0		30.0	30.0		35.0	35.0		10.0	45.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		46.7%	46.7%		13.3%	60.0%	
Maximum Green (s)	24.6	24.6		24.6	24.6		29.6	29.6		7.0	39.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.0	3.3	
All-Red Time (s)	2.1	2.1		2.1	2.1		2.1	2.1		0.0	2.1	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.4			5.4			5.4			5.4	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
Recall Mode	None	None		None	None		C-Min	C-Min		None	C-Min	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	20	20		20	20		35	35		35	35	
Act Effect Green (s)		15.2			15.2			53.2			53.2	
Actuated g/C Ratio		0.20			0.20			0.71			0.71	
v/c Ratio		0.29			0.29			0.33			0.58	
Control Delay		21.5			9.9			7.7			11.5	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		21.5			9.9			7.7			11.5	
LOS		C			A			A			B	
Approach Delay		21.5			9.9			7.7			11.5	
Approach LOS		C			A			A			B	

Intersection Summary

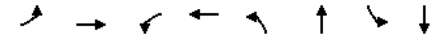
Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 10.8 Intersection LOS: B
 Intersection Capacity Utilization 82.7% ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 8: Kerr Street & Stewart Street



Timings
8: Kerr Street & Stewart Street

2026 Future Background PM
50 Speers Road

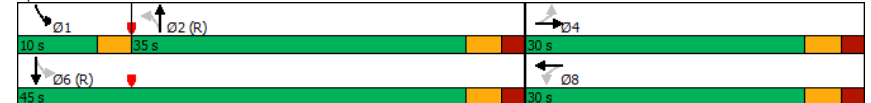


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕		↕		↕
Traffic Volume (vph)	50	10	10	15	10	370	55	550
Future Volume (vph)	50	10	10	15	10	370	55	550
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	24.0	24.0	6.0	24.0
Minimum Split (s)	30.0	30.0	30.0	30.0	32.0	32.0	10.0	32.0
Total Split (s)	30.0	30.0	30.0	30.0	35.0	35.0	10.0	45.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	46.7%	46.7%	13.3%	60.0%
Maximum Green (s)	24.6	24.6	24.6	24.6	29.6	29.6	7.0	39.6
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.0	3.3
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	2.1
Lost Time Adjust (s)		0.0		0.0		0.0		0.0
Total Lost Time (s)		5.4		5.4		5.4		5.4
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	C-Min	C-Min	None	C-Min
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)	13.0	13.0	13.0	13.0	14.0	14.0	14.0	14.0
Pedestrian Calls (#/hr)	20	20	20	20	35	35	35	35

Intersection Summary

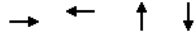
Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated

Splits and Phases: 8: Kerr Street & Stewart Street



Queues
8: Kerr Street & Stewart Street

2026 Future Background PM
50 Speers Road



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	81	109	429	712
w/c Ratio	0.29	0.29	0.33	0.58
Control Delay	21.5	9.9	7.7	11.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.5	9.9	7.7	11.5
Queue Length 50th (m)	8.5	3.4	17.4	37.5
Queue Length 95th (m)	16.4	13.0	52.1	113.6
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)				
Base Capacity (vph)	447	556	1293	1220
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced w/c Ratio	0.18	0.20	0.33	0.58
Intersection Summary				

HCM Signalized Intersection Capacity Analysis
8: Kerr Street & Stewart Street

2026 Future Background PM
50 Speers Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	50	10	15	10	15	75	10	370	15	55	550	50
Future Volume (vph)	50	10	15	10	15	75	10	370	15	55	550	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.4			5.4			5.4			5.4	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.99			0.96			1.00			0.99	
Flpb, ped/bikes		0.98			1.00			1.00			1.00	
Frt		0.97			0.90			0.99			0.99	
Flt Protected		0.97			0.99			1.00			1.00	
Satd. Flow (prot)		1675			1575			1854			1827	
Flt Permitted		0.77			0.97			0.98			0.94	
Satd. Flow (perm)		1334			1530			1823			1716	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	11	16	11	16	82	11	402	16	60	598	54
RTOR Reduction (vph)	0	13	0	0	68	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	68	0	0	41	0	0	428	0	0	709	0
Confl. Peds. (#/hr)	20		15	15		20	35		25	25		35
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.2			13.2			51.0			51.0	
Effective Green, g (s)		13.2			13.2			51.0			51.0	
Actuated g/C Ratio		0.18			0.18			0.68			0.68	
Clearance Time (s)		5.4			5.4			5.4			5.4	
Vehicle Extension (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		234			269			1239			1166	
v/s Ratio Prot												
v/s Ratio Perm		c0.05			0.03			0.23			c0.41	
v/c Ratio		0.29			0.15			0.35			0.61	
Uniform Delay, d1		26.8			26.2			5.0			6.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.9			0.4			0.8			0.9	
Delay (s)		27.8			26.5			5.8			7.5	
Level of Service		C			C			A			A	
Approach Delay (s)		27.8			26.5			5.8			7.5	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		9.7			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.57										
Actuated Cycle Length (s)		75.0			Sum of lost time (s)			13.8				
Intersection Capacity Utilization		82.7%			ICU Level of Service			E				
Analysis Period (min)		15										

c Critical Lane Group

Lanes, Volumes, Timings

2026 Future Background PM

9: Speers Internal Road 1 & Speers Road

50 Speers Road

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕	↕	↕
Traffic Volume (vph)	1055	35	5	1615	0	5
Future Volume (vph)	1055	35	5	1615	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt	0.995			0.865		
Flt Protected						
Satd. Flow (prot)	3592	0	0	3610	1644	0
Flt Permitted						
Satd. Flow (perm)	3592	0	0	3610	1644	0
Link Speed (k/h)	60			60	20	
Link Distance (m)	147.2			113.4	44.5	
Travel Time (s)	8.8			6.8	8.0	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1077	36	5	1648	0	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1113	0	0	1653	5	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	58.1%
Analysis Period (min)	15
	ICU Level of Service B

HCM Unsignalized Intersection Capacity Analysis

2026 Future Background PM

9: Speers Internal Road 1 & Speers Road

50 Speers Road

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕	↕	↕
Traffic Volume (veh/h)	1055	35	5	1615	0	5
Future Volume (Veh/h)	1055	35	5	1615	0	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	1077	36	5	1648	0	5
Pedestrians	1			1		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	147			347		
pX, platoon unblocked			0.86		0.87	0.86
vC, conflicting volume			1113		1930	558
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			799		1029	151
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	99
cM capacity (veh/h)			714		201	749

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	718	395	554	1099	5
Volume Left	0	0	5	0	0
Volume Right	0	36	0	0	5
cSH	1700	1700	714	1700	749
Volume to Capacity	0.42	0.23	0.01	0.65	0.01
Queue Length 95th (m)	0.0	0.0	0.2	0.0	0.2
Control Delay (s)	0.0	0.0	0.2	0.0	9.8
Lane LOS			A		A
Approach Delay (s)	0.0		0.1		9.8
Approach LOS					A

Intersection Summary

Average Delay	0.1
Intersection Capacity Utilization	58.1%
Analysis Period (min)	15
	ICU Level of Service B

Lanes, Volumes, Timings

2026 Future Background PM

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

50 Speers Road

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	5	0	0	35	5
Future Volume (vph)	0	5	0	0	35	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected						0.958
Satd. Flow (prot)	1644	0	1900	0	0	1820
Flt Permitted						0.958
Satd. Flow (perm)	1644	0	1900	0	0	1820
Link Speed (k/h)	20					
Link Distance (m)	35.0		49.5		44.5	
Travel Time (s)	6.3		8.9		8.0	
Confl. Peds. (#/hr)	8					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%					
Adj. Flow (vph)	0	6	0	0	44	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	6	0	0	0	0	50
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6					
Link Offset(m)	0.0					
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	14	14	24	
Sign Control	Stop		Free		Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	15.7%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

2026 Future Background PM

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

50 Speers Road

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	5	0	0	35	5
Future Volume (Veh/h)	0	5	0	0	35	5
Sign Control	Stop		Free		Free	
Grade	0%					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	6	0	0	44	6
Pedestrians	2					
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage						1
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	96	8	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	96	8	0			
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			97	
cM capacity (veh/h)	882	1072			1636	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	6	0	50
Volume Left	0	0	44
Volume Right	6	0	0
cSH	1072	1700	1636
Volume to Capacity	0.01	0.00	0.03
Queue Length 95th (m)	0.1	0.0	0.6
Control Delay (s)	8.4	0.0	6.4
Lane LOS	A		A
Approach Delay (s)	8.4	0.0	6.4
Approach LOS	A		

Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	15.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
11: PUDO + Parking & Speers Internal Road

2026 Future Background PM
50 Speers Road

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (vph)	25	10	5	5	0	5
Future Volume (vph)	25	10	5	5	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.961			0.865		
Flt Protected			0.976			
Satd. Flow (prot)	1826	0	0	1854	1644	0
Flt Permitted			0.976			
Satd. Flow (perm)	1826	0	0	1854	1644	0
Link Speed (k/h)	20		20	20		
Link Distance (m)	35.0		37.7	75.1		
Travel Time (s)	6.3		6.8	13.5		
Confl. Peds. (#/hr)			13			
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	32	13	6	6	0	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	45	0	0	12	6	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0		0.0	3.6		
Link Offset(m)	0.0		0.0	0.0		
Crosswalk Width(m)	1.6		1.6	1.6		
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		14	24	24	14	
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	14.7%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
11: PUDO + Parking & Speers Internal Road

2026 Future Background PM
50 Speers Road

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (veh/h)	25	10	5	5	0	5
Future Volume (Veh/h)	25	10	5	5	0	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	32	13	6	6	0	6
Pedestrians	13			2		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	1			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			45		70	40
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			45		70	40
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			1576		925	1035
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	45	12	6			
Volume Left	0	6	0			
Volume Right	13	0	6			
cSH	1700	1576	1035			
Volume to Capacity	0.03	0.00	0.01			
Queue Length 95th (m)	0.0	0.1	0.1			
Control Delay (s)	0.0	3.7	8.5			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.7	8.5			
Approach LOS			A			
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utilization		14.7%		ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
12: Underground & Speers Internal Road

2026 Future Background PM
50 Speers Road

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (vph)	25	5	5	10	0	0
Future Volume (vph)	25	5	5	10	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.979					
Flt Protected				0.984		
Satd. Flow (prot)	1860	0	0	1870	1900	0
Flt Permitted				0.984		
Satd. Flow (perm)	1860	0	0	1870	1900	0
Link Speed (k/h)	20		20		20	
Link Distance (m)	37.7		38.9		38.9	
Travel Time (s)	6.8		7.0		7.0	
Confl. Peds. (#/hr)			10			
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	32	6	6	13	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	38	0	0	19	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0		0.0		3.6	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	14		24		24	
Sign Control	Free		Free		Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	8.3%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
12: Underground & Speers Internal Road

2026 Future Background PM
50 Speers Road

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (veh/h)	25	5	5	10	0	0
Future Volume (Veh/h)	25	5	5	10	0	0
Sign Control	Free			Stop		
Grade	0%			0%		
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	32	6	6	13	0	0
Pedestrians	10			3		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	1			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume				38	70	38
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				38	70	38
tC, single (s)				4.1	6.4	6.2
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				100	100	100
cM capacity (veh/h)				1585	927	1037
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	38	19	0			
Volume Left	0	6	0			
Volume Right	6	0	0			
cSH	1700	1585	1700			
Volume to Capacity	0.02	0.00	0.01			
Queue Length 95th (m)	0.0	0.1	0.0			
Control Delay (s)	0.0	2.3	0.0			
Lane LOS	A			A		
Approach Delay (s)	0.0	2.3	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay				0.8		
Intersection Capacity Utilization	8.3%			ICU Level of Service		A
Analysis Period (min)	15					

Lanes, Volumes, Timings 2026 Future Background PM
 13: PUDO Exit/Speers Internal Road 2 & Speers Internal Road/30 Speers 50 Speers Road

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	5	20	0	0	0	10	0	5	0	0	0	15
Future Volume (vph)	5	20	0	0	0	10	0	5	0	0	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							0.865			0.865		
Flt Protected	0.990											
Satd. Flow (prot)	0	1809	0	0	1644	0	0	1900	0	0	1467	0
Flt Permitted	0.990											
Satd. Flow (perm)	0	1809	0	0	1644	0	0	1900	0	0	1467	0
Link Speed (k/h)	20		20		20		20		20		20	
Link Distance (m)	38.9		43.4		75.5		49.2		49.2		49.2	
Travel Time (s)	7.0		7.8		13.6		8.9		8.9		8.9	
Confl. Peds. (#/hr)	2		8	8		2		7	7			
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Heavy Vehicles (%)	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%
Adj. Flow (vph)	8	32	0	0	0	16	0	8	0	0	0	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	40	0	0	16	0	0	8	0	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6		1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control	Stop		Stop		Free		Free		Free		Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	19.3%			ICU Level of Service A								
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis 2026 Future Background PM
 13: PUDO Exit/Speers Internal Road 2 & Speers Internal Road/30 Speers 50 Speers Road

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕			↕			↕			↕		
Traffic Volume (veh/h)	5	20	0	0	0	10	0	5	0	0	0	15	
Future Volume (Veh/h)	5	20	0	0	0	10	0	5	0	0	0	15	
Sign Control	Stop		Stop		Free		Free		Free		Free		
Grade	0%												
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	
Hourly flow rate (vph)	8	32	0	0	0	16	0	8	0	0	0	24	
Pedestrians	3		7		8		3		3		3		
Lane Width (m)	3.6		3.6		3.6		3.6		3.6		3.6		
Walking Speed (m/s)	1.1		1.1		1.1		1.1		1.1		1.1		
Percent Blockage	0		1		1		0		0		0		
Right turn flare (veh)													
Median type	None						None						
Median storage (veh)													
Upstream signal (m)													
pX, platoon unblocked													
vC, conflicting volume	42	30	23	51	42	18	27				15		
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	42	30	23	51	42	18	27				15		
tC, single (s)	7.3	6.5	6.2	7.1	6.5	6.2	4.1				4.1		
tC, 2 stage (s)													
tF (s)	3.7	4.0	3.3	3.5	4.0	3.3	2.2				2.2		
p0 queue free %	99	96	100	100	100	98	100				100		
cM capacity (veh/h)	893	859	1049	907	846	1057	1596				1606		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	40	16	8	24									
Volume Left	8	0	0	0									
Volume Right	0	16	0	24									
cSH	866	1057	1596	1606									
Volume to Capacity	0.05	0.02	0.00	0.00									
Queue Length 95th (m)	1.1	0.4	0.0	0.0									
Control Delay (s)	9.4	8.5	0.0	0.0									
Lane LOS	A	A											
Approach Delay (s)	9.4	8.5	0.0	0.0									
Approach LOS	A	A											
Intersection Summary													
Average Delay	5.8												
Intersection Capacity Utilization	19.3%			ICU Level of Service						A			
Analysis Period (min)	15												

Lanes, Volumes, Timings 2026 Future Background PM
 14: Speers Internal Road 2/41 Speers Driveways & Speers Road 50 Speers Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (vph)	0	1060	5	10	1605	0	10	0	10	5	0	5
Future Volume (vph)	0	1060	5	10	1605	0	10	0	10	5	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.999				0.932				0.932			
Flt Protected												
Satd. Flow (prot)	0	3536	0	0	3540	0	0	1728	0	0	1694	0
Flt Permitted												
Satd. Flow (perm)	0	3536	0	0	3540	0	0	1728	0	0	1694	0
Link Speed (k/h)	60			60			20			20		
Link Distance (m)	113.4			233.1			49.2			39.0		
Travel Time (s)	6.8			14.0			8.9			7.0		
Confl. Peds. (#/hr)	8			8								
Confl. Bikes (#/hr)	1											
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	2%	0%	2%	2%	2%
Adj. Flow (vph)	0	1116	5	11	1689	0	11	0	11	5	0	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1121	0	0	1700	0	0	22	0	0	10	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.6			3.6			0.0			0.0		
Link Offset(m)	0.0			0.0			0.0			0.0		
Crosswalk Width(m)	1.6			1.6			1.6			1.6		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14		24		14		24		14	
Sign Control	Free			Free			Stop			Stop		

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	61.4%
ICU Level of Service	B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis 2026 Future Background PM
 14: Speers Internal Road 2/41 Speers Driveways & Speers Road 50 Speers Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (veh/h)	0	1060	5	10	1605	0	10	0	10	5	0	5
Future Volume (Veh/h)	0	1060	5	10	1605	0	10	0	10	5	0	5
Sign Control	Free			Free			Stop			Stop		
Grade	0%											
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Hourly flow rate (vph)	0	1116	5	11	1689	0	11	0	11	5	0	5
Pedestrians	4			4			8			8		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	0			0			1			1		
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)	261			233								
pX, platoon unblocked	0.79			0.88			0.86			0.86		
vC, conflicting volume	1689			1129			2002			2838		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1349			867			1188			2165		
tC, single (s)	4.1			4.1			7.5			6.5		
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5			4.0		
p0 queue free %	100			98			91			100		
cM capacity (veh/h)	402			684			120			39		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	744	377	574	1126	22	10
Volume Left	0	0	11	0	11	5
Volume Right	0	5	0	0	11	5
cSH	1700	1700	684	1700	204	120
Volume to Capacity	0.44	0.22	0.02	0.66	0.11	0.08
Queue Length 95th (m)	0.0	0.0	0.4	0.0	2.7	2.0
Control Delay (s)	0.0	0.0	0.4	0.0	24.8	37.7
Lane LOS	A		C		E	
Approach Delay (s)	0.0		0.1		24.8	
Approach LOS	C		E			

Intersection Summary	
Average Delay	0.4
Intersection Capacity Utilization	61.4%
ICU Level of Service	B
Analysis Period (min)	15

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

02/29/2024

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖		↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	35	650	90	185	495	185	100	115	370	355	165	75
Future Volume (vph)	35	650	90	185	495	185	100	115	370	355	165	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	105.0		0.0	75.0		100.0	50.0		45.0	0.0		0.0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	1.00				0.94	0.96		0.93	0.95		0.98
Frt		0.982				0.850			0.850		0.953	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3469	0	1752	3539	1583	1787	1900	1599	1787	1771	0
Flt Permitted	0.459			0.232			0.602			0.568		
Satd. Flow (perm)	853	3469	0	428	3539	1485	1085	1900	1486	1018	1771	0
Right Turn on Red			Yes			Yes		Yes				Yes
Satd. Flow (RTOR)		13				195			253		22	
Link Speed (kh)		60			60			50			50	
Link Distance (m)		235.8			147.2			127.4			167.2	
Travel Time (s)		14.1			8.8			9.2			12.0	
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Adj. Flow (vph)	37	684	95	195	521	195	105	121	389	374	174	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	779	0	195	521	195	105	121	389	374	253	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

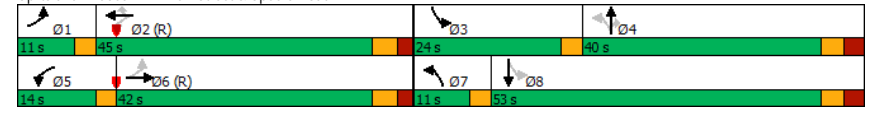
02/29/2024

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2		2	4		4	8		
Detector Phase	1	6		5	2	2	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	7.0	25.0		7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0	
Minimum Split (s)	10.0	30.9		10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3	
Total Split (s)	11.0	42.0		14.0	45.0	45.0	11.0	40.0	40.0	24.0	53.0	
Total Split (%)	9.2%	35.0%		11.7%	37.5%	37.5%	9.2%	33.3%	33.3%	20.0%	44.2%	
Maximum Green (s)	8.0	36.1		11.0	39.1	39.1	8.0	33.7	33.7	21.0	46.7	
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	
All-Red Time (s)	0.0	2.2		0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	5.5		2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	
Walk Time (s)		7.0			7.0	7.0		7.0		7.0		7.0
Flash Dont Walk (s)		14.0			14.0	14.0		14.0		14.0		14.0
Pedestrian Calls (#/hr)		15			15	15		35		35		35
Act Effect Green (s)	58.8	48.7		65.9	56.8	56.8	32.1	20.6	20.6	48.1	33.6	
Actuated g/C Ratio	0.49	0.41		0.55	0.47	0.47	0.27	0.17	0.17	0.40	0.28	
v/c Ratio	0.08	0.55		0.54	0.31	0.24	0.31	0.37	0.84	0.69	0.49	
Control Delay	16.5	30.9		22.1	23.1	4.6	24.4	44.7	31.6	33.1	34.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.0	
Total Delay	16.5	30.9		22.1	23.1	4.6	24.4	44.7	31.6	35.8	34.5	
LOS	B	C		C	C	A	C	D	C	D	C	
Approach Delay		30.3			18.9			33.0			35.3	
Approach LOS		C			B			C			D	

Intersection Summary

Area Type:	Other
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	43 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.84
Intersection Signal Delay:	28.4
Intersection Capacity Utilization:	82.3%
Analysis Period (min):	15
Intersection LOS:	C
ICU Level of Service:	E

Splits and Phases: 1: Kerr Street & Speers Road



Timings
1: Kerr Street & Speers Road

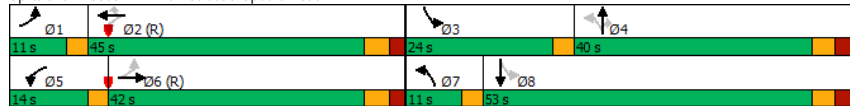
02/29/2024

	↖	→	↙	←	↘	↖	↙	↘	↖	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	35	650	185	495	185	100	115	370	355	165
Future Volume (vph)	35	650	185	495	185	100	115	370	355	165
Turn Type	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	1	6	5	2		7	4		3	8
Permitted Phases	6	2	2	4	4	4	8			
Detector Phase	1	6	5	2	2	7	4	4	3	8
Switch Phase										
Minimum Initial (s)	7.0	25.0	7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0
Minimum Split (s)	10.0	30.9	10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3
Total Split (s)	11.0	42.0	14.0	45.0	45.0	11.0	40.0	40.0	24.0	53.0
Total Split (%)	9.2%	35.0%	11.7%	37.5%	37.5%	9.2%	33.3%	33.3%	20.0%	44.2%
Yellow Time (s)	3.0	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3
All-Red Time (s)	0.0	2.2	0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	None	C-Min	C-Min	None	None	None	None	None
Act Effect Green (s)	58.8	48.7	65.9	56.8	56.8	32.1	20.6	20.6	48.1	33.6
Actuated g/C Ratio	0.49	0.41	0.55	0.47	0.47	0.27	0.17	0.17	0.40	0.28
v/c Ratio	0.08	0.55	0.54	0.31	0.24	0.31	0.37	0.84	0.69	0.49
Control Delay	16.5	30.9	22.1	23.1	4.6	24.4	44.7	31.6	33.1	34.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.0
Total Delay	16.5	30.9	22.1	23.1	4.6	24.4	44.7	31.6	35.8	34.5
LOS	B	C	C	C	A	C	D	C	D	C
Approach Delay		30.3		18.9			33.0			35.3
Approach LOS		C		B			C			D

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 43 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.84
 Intersection Signal Delay: 28.4
 Intersection LOS: C
 Intersection Capacity Utilization 82.3%
 ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 1: Kerr Street & Speers Road



Queues
1: Kerr Street & Speers Road

02/29/2024

	↖	→	↙	←	↘	↖	↙	↘	↖	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	37	779	195	521	195	105	121	389	374	253
v/c Ratio	0.08	0.55	0.54	0.31	0.24	0.31	0.37	0.84	0.69	0.49
Control Delay	16.5	30.9	22.1	23.1	4.6	24.4	44.7	31.6	33.1	34.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.0
Total Delay	16.5	30.9	22.1	23.1	4.6	24.4	44.7	31.6	35.8	34.5
Queue Length 50th (m)	4.0	75.7	23.5	43.1	0.0	14.9	25.4	31.8	63.3	44.6
Queue Length 95th (m)	11.2	107.8	44.4	66.4	15.8	22.2	37.6	61.8	76.7	59.3
Internal Link Dist (m)		211.8		123.2			103.4			143.2
Turn Bay Length (m)	105.0		75.0		100.0	50.0		45.0		
Base Capacity (vph)	487	1415	368	1675	805	340	533	599	546	702
Starvation Cap Reductn	0	0	0	0	0	0	0	0	85	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.55	0.53	0.31	0.24	0.31	0.23	0.65	0.81	0.36

Intersection Summary

HCM Signalized Intersection Capacity Analysis

1: Kerr Street & Speers Road

02/29/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	35	650	90	185	495	185	100	115	370	355	165	75
Future Volume (vph)	35	650	90	185	495	185	100	115	370	355	165	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frb, ped/bikes	1.00	1.00		1.00	1.00	0.94	1.00	1.00	0.93	1.00	0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00	1.00	0.98	1.00	1.00	0.97	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1786	3468		1752	3539	1485	1743	1900	1486	1742	1771	
Flt Permitted	0.46	1.00		0.23	1.00	1.00	0.60	1.00	1.00	0.57	1.00	
Satd. Flow (perm)	863	3468		428	3539	1485	1105	1900	1486	1042	1771	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	37	684	95	195	521	195	105	121	389	374	174	79
RTOR Reduction (vph)	0	8	0	0	0	104	0	0	210	0	16	0
Lane Group Flow (vph)	37	771	0	195	521	91	105	121	179	374	237	0
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2		2	4		4	8		
Actuated Green, G (s)	53.2	48.8		63.1	55.7	55.7	28.7	20.6	20.6	44.7	33.6	
Effective Green, g (s)	53.2	48.8		63.1	55.7	55.7	28.7	20.6	20.6	44.7	33.6	
Actuated g/C Ratio	0.44	0.41		0.53	0.46	0.46	0.24	0.17	0.17	0.37	0.28	
Clearance Time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Vehicle Extension (s)	2.5	5.5		2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	
Lane Grp Cap (vph)	416	1410		349	1642	689	307	326	255	511	495	
v/s Ratio Prot	0.00	0.22		c0.05	0.15		0.02	0.06		c0.13	0.13	
v/s Ratio Perm	0.04			c0.24		0.06	0.06		0.12	c0.14		
v/c Ratio	0.09	0.55		0.56	0.32	0.13	0.34	0.37	0.70	0.73	0.48	
Uniform Delay, d1	19.0	27.2		17.1	20.2	18.3	37.0	44.0	46.8	30.2	35.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	1.5		1.6	0.5	0.4	0.5	1.0	9.1	5.1	1.0	
Delay (s)	19.1	28.7		18.7	20.7	18.7	37.4	44.9	55.9	35.2	36.9	
Level of Service	B	C		B	C	B	D	D	E	D	D	
Approach Delay (s)		28.3			19.9			50.6			35.9	
Approach LOS		C			B			D			D	

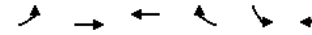
Intersection Summary		
HCM 2000 Control Delay	31.9	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.66	
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	82.3%	ICU Level of Service
Analysis Period (min)	15	

c Critical Lane Group

Lanes, Volumes, Timings

2: Speers Road & Cross Avenue

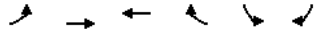
02/29/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	220	1205	605	20	5	245
Future Volume (vph)	220	1205	605	20	5	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	80.0			0.0	45.0	0.0
Storage Lanes	1			0	1	2
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	0.88
Ped Bike Factor	1.00		1.00			
Frt			0.995			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1703	3610	3554	0	1805	2733
Flt Permitted	0.373				0.950	
Satd. Flow (perm)	667	3610	3554	0	1805	2733
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			3			255
Link Speed (k/h)		60	60		48	
Link Distance (m)		233.1	101.5		84.0	
Travel Time (s)		14.0	6.1		6.3	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Adj. Flow (vph)	229	1255	630	21	5	255
Shared Lane Traffic (%)						
Lane Group Flow (vph)	229	1255	651	0	5	255
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
2: Speers Road & Cross Avenue

02/29/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Detector Phase	5	2	6		4	4
Switch Phase						
Minimum Initial (s)	6.0	38.0	38.0		10.0	10.0
Minimum Split (s)	12.0	47.6	47.6		15.8	15.8
Total Split (s)	35.0	109.0	74.0		31.0	31.0
Total Split (%)	25.0%	77.9%	52.9%		22.1%	22.1%
Maximum Green (s)	29.0	102.4	67.4		25.2	25.2
Yellow Time (s)	4.0	3.7	3.7		3.3	3.3
All-Red Time (s)	2.0	2.9	2.9		2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6		5.8	5.8
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Recall Mode	None	C-Min	C-Min		None	None
Walk Time (s)		10.0	10.0			
Flash Dont Walk (s)		31.0	31.0			
Pedestrian Calls (#/hr)		5	5			
Act Effect Green (s)	118.0	117.4	101.9		10.2	10.2
Actuated g/C Ratio	0.84	0.84	0.73		0.07	0.07
v/c Ratio	0.36	0.41	0.25		0.04	0.58
Control Delay	3.7	3.3	6.7		60.8	12.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	3.7	3.3	6.7		60.8	12.8
LOS	A	A	A		E	B
Approach Delay		3.3	6.7		13.7	
Approach LOS		A	A		B	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 99 (71%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 5.4 Intersection LOS: A
 Intersection Capacity Utilization 70.0% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: Speers Road & Cross Avenue



Timings
2: Speers Road & Cross Avenue

02/29/2024

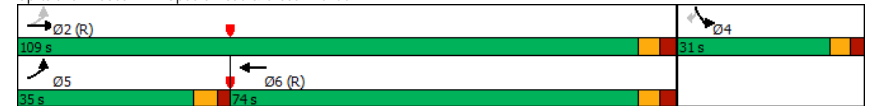


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↕↕	↕↕	↔	↕↕
Traffic Volume (vph)	220	1205	605	5	245
Future Volume (vph)	220	1205	605	5	245
Turn Type	pm+pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2				4
Detector Phase	5	2	6	4	4
Switch Phase					
Minimum Initial (s)	6.0	38.0	38.0	10.0	10.0
Minimum Split (s)	12.0	47.6	47.6	15.8	15.8
Total Split (s)	35.0	109.0	74.0	31.0	31.0
Total Split (%)	25.0%	77.9%	52.9%	22.1%	22.1%
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	None	None
Act Effect Green (s)	118.0	117.4	101.9	10.2	10.2
Actuated g/C Ratio	0.84	0.84	0.73	0.07	0.07
v/c Ratio	0.36	0.41	0.25	0.04	0.58
Control Delay	3.7	3.3	6.7	60.8	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.7	3.3	6.7	60.8	12.8
LOS	A	A	A	E	B
Approach Delay		3.3	6.7	13.7	
Approach LOS		A	A	B	

Intersection Summary

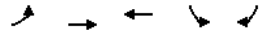
Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 99 (71%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 5.4 Intersection LOS: A
 Intersection Capacity Utilization 70.0% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: Speers Road & Cross Avenue



Queues
2: Speers Road & Cross Avenue

02/29/2024

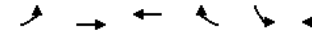


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	229	1255	651	5	255
w/c Ratio	0.36	0.41	0.25	0.04	0.58
Control Delay	3.7	3.3	6.7	60.8	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.7	3.3	6.7	60.8	12.8
Queue Length 50th (m)	8.8	35.0	28.0	1.3	0.0
Queue Length 95th (m)	14.2	44.4	38.5	5.8	14.3
Internal Link Dist (m)		209.1	77.5	60.0	
Turn Bay Length (m)	80.0		45.0		
Base Capacity (vph)	776	3026	2588	324	701
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.30	0.41	0.25	0.02	0.36

Intersection Summary

HCM Signalized Intersection Capacity Analysis
2: Speers Road & Cross Avenue

02/29/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗↘	↗↘		↘	↗↘
Traffic Volume (vph)	220	1205	605	20	5	245
Future Volume (vph)	220	1205	605	20	5	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.6	6.6		5.8	5.8
Lane Util. Factor	1.00	0.95	0.95		1.00	0.88
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1701	3610	3555		1805	2733
Flt Permitted	0.37	1.00	1.00		0.95	1.00
Satd. Flow (perm)	668	3610	3555		1805	2733
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	229	1255	630	21	5	255
RTOR Reduction (vph)	0	0	1	0	0	236
Lane Group Flow (vph)	229	1255	650	0	5	19
Confl. Peds. (#/hr)	5			5		
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	117.4	117.4	102.0		10.2	10.2
Effective Green, g (s)	117.4	117.4	102.0		10.2	10.2
Actuated g/C Ratio	0.84	0.84	0.73		0.07	0.07
Clearance Time (s)	6.0	6.6	6.6		5.8	5.8
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Lane Grp Cap (vph)	629	3027	2590		131	199
v/s Ratio Prot	0.02	c0.35	0.18		0.00	
v/s Ratio Perm	0.28					c0.01
w/c Ratio	0.36	0.41	0.25		0.04	0.09
Uniform Delay, d1	2.5	2.8	6.3		60.3	60.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.4	0.4	0.2		0.1	0.2
Delay (s)	2.9	3.2	6.5		60.5	60.8
Level of Service	A	A	A		E	E
Approach Delay (s)		3.2	6.5		60.8	
Approach LOS		A	A		E	

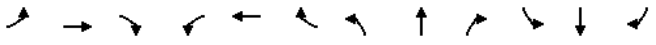
Intersection Summary

HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
3: St. Augustine Drive & Speers Road

02/29/2024




Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕			↕				↕		↕	
Traffic Volume (vph)	5	725	15	0	645	20	5	0	50	0	0	0
Future Volume (vph)	5	725	15	0	645	20	5	0	50	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		1	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.995				0.865			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1805	3561	0	0	3557	0	0	0	1644	0	1900	0
Flt Permitted	0.950							0.950				
Satd. Flow (perm)	1805	3561	0	0	3557	0	0	0	1644	0	1900	0
Link Speed (k/h)		60			60				40			30
Link Distance (m)		248.1			235.8				188.1			117.6
Travel Time (s)		14.9			14.1				16.9			14.1
Confl. Peds. (#/hr)	8		5	5		8	1		1	1		1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	5	755	16	0	672	21	5	0	52	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	771	0	0	693	0	0	5	52	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6				0.0			0.0
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		1.6			1.6				1.6			1.6
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free				Stop			Stop

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
3: St. Augustine Drive & Speers Road

02/29/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕			↕				↕		↕	
Traffic Volume (veh/h)	5	725	15	0	645	20	5	0	50	0	0	0
Future Volume (Veh/h)	5	725	15	0	645	20	5	0	50	0	0	0
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	755	16	0	672	21	5	0	52	0	0	0
Pedestrians	1			1			5			8		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	0			0			0			1		
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)	236											
pX, platoon unblocked	0.92						0.92			0.92		
vC, conflicting volume	701			776			1115			1479		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	490			776			942			1340		
tC, single (s)	4.1			4.1			7.5			6.5		
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5			4.0		
p0 queue free %	99			100			97			100		
cM capacity (veh/h)	985			845			198			139		
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1					
Volume Total	5	503	268	448	245	57	0					
Volume Left	5	0	0	0	0	5	0					
Volume Right	0	0	16	0	21	52	0					
cSH	985	1700	1700	1700	1700	516	1700					
Volume to Capacity	0.01	0.30	0.16	0.26	0.14	0.11	0.04					
Queue Length 95th (m)	0.1	0.0	0.0	0.0	0.0	2.8	0.0					
Control Delay (s)	8.7	0.0	0.0	0.0	0.0	12.8	0.0					
Lane LOS	A			B			A					
Approach Delay (s)	0.1			0.0			12.8			0.0		
Approach LOS				B			A					
Intersection Summary												
Average Delay				0.5								
Intersection Capacity Utilization				Err%			ICU Level of Service			H		
Analysis Period (min)				15								

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

02/29/2024

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙		↖			↘
Traffic Volume (vph)	80	165	270	60	95	520
Future Volume (vph)	80	165	270	60	95	520
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor	0.98		1.00			1.00
Frt	0.909		0.973			
Flt Protected	0.984					0.992
Satd. Flow (prot)	1652	0	3454	0	0	3551
Flt Permitted	0.984					0.840
Satd. Flow (perm)	1645	0	3454	0	0	3005
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	126		37			
Link Speed (kh)	50		50			50
Link Distance (m)	265.3		167.2			26.5
Travel Time (s)	19.1		12.0			1.9
Confl. Peds. (#/hr)	13	6		4	4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	1%	1%	2%	0%	1%
Adj. Flow (vph)	82	170	278	62	98	536
Shared Lane Traffic (%)						
Lane Group Flow (vph)	252	0	340	0	0	634
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14		14	24	
Number of Detectors	1		2		1	2
Detector Template	Left		Thru		Left	Thru
Leading Detector (m)	2.0		10.0		2.0	10.0
Trailing Detector (m)	0.0		0.0		0.0	0.0
Detector 1 Position(m)	0.0		0.0		0.0	0.0
Detector 1 Size(m)	2.0		0.6		2.0	0.6
Detector 1 Type	CI+Ex		CI+Ex		CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0		0.0	0.0
Detector 1 Queue (s)	0.0		0.0		0.0	0.0
Detector 1 Delay (s)	0.0		0.0		0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			CI+Ex			CI+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases					6	

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

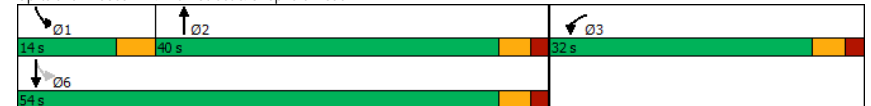
02/29/2024

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase	3		2		1	6
Switch Phase						
Minimum Initial (s)	10.0		18.0		7.0	18.0
Minimum Split (s)	31.4		28.2		11.0	28.2
Total Split (s)	32.0		40.0		14.0	54.0
Total Split (%)	37.2%		46.5%		16.3%	62.8%
Maximum Green (s)	26.6		34.8		10.0	48.8
Yellow Time (s)	3.3		3.3		4.0	3.3
All-Red Time (s)	2.1		1.9		0.0	1.9
Lost Time Adjust (s)	0.0		0.0			0.0
Total Lost Time (s)	5.4		5.2			5.2
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.5		2.5	3.5
Recall Mode	None		Min		None	Min
Walk Time (s)	10.0		10.0			10.0
Flash Dont Walk (s)	16.0		13.0			13.0
Pedestrian Calls (#/hr)	0		5			5
Act Effect Green (s)	10.6		19.0			19.0
Actuated g/C Ratio	0.26		0.47			0.47
v/c Ratio	0.48		0.21			0.45
Control Delay	10.4		5.9			8.4
Queue Delay	0.0		0.0			0.0
Total Delay	10.4		5.9			8.4
LOS	B		A			A
Approach Delay	10.4		5.9			8.4
Approach LOS	B		A			A

Intersection Summary

Area Type: Other
 Cycle Length: 86
 Actuated Cycle Length: 40.2
 Natural Cycle: 75
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.48
 Intersection Signal Delay: 8.1
 Intersection Capacity Utilization 62.0%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 4: Kerr Street & Shepherd Road



Timings
4: Kerr Street & Shepherd Road

02/29/2024

	↙	↑	↘	↓
Lane Group	WBL	NBT	SBL	SBT
Lane Configurations	↔	↕	↔	↕
Traffic Volume (vph)	80	270	95	520
Future Volume (vph)	80	270	95	520
Turn Type	Prot	NA	pm+pt	NA
Protected Phases	3	2	1	6
Permitted Phases			6	
Detector Phase	3	2	1	6
Switch Phase				
Minimum Initial (s)	10.0	18.0	7.0	18.0
Minimum Split (s)	31.4	28.2	11.0	28.2
Total Split (s)	32.0	40.0	14.0	54.0
Total Split (%)	37.2%	46.5%	16.3%	62.8%
Yellow Time (s)	3.3	3.3	4.0	3.3
All-Red Time (s)	2.1	1.9	0.0	1.9
Lost Time Adjust (s)	0.0	0.0		0.0
Total Lost Time (s)	5.4	5.2		5.2
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	None	Min	None	Min
Act Effect Green (s)	10.6	19.0		19.0
Actuated g/C Ratio	0.26	0.47		0.47
v/c Ratio	0.48	0.21		0.45
Control Delay	10.4	5.9		8.4
Queue Delay	0.0	0.0		0.0
Total Delay	10.4	5.9		8.4
LOS	B	A		A
Approach Delay	10.4	5.9		8.4
Approach LOS	B	A		A

Intersection Summary

Cycle Length: 86
 Actuated Cycle Length: 40.2
 Natural Cycle: 75
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.48
 Intersection Signal Delay: 8.1 Intersection LOS: A
 Intersection Capacity Utilization 62.0% ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 4: Kerr Street & Shepherd Road



Queues
4: Kerr Street & Shepherd Road

02/29/2024

	↙	↑	↓
Lane Group	WBL	NBT	SBT
Lane Group Flow (vph)	252	340	634
v/c Ratio	0.48	0.21	0.45
Control Delay	10.4	5.9	8.4
Queue Delay	0.0	0.0	0.0
Total Delay	10.4	5.9	8.4
Queue Length 50th (m)	6.5	5.4	13.0
Queue Length 95th (m)	22.2	11.6	25.0
Internal Link Dist (m)	241.3	143.2	2.5
Turn Bay Length (m)			
Base Capacity (vph)	1141	3012	3005
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.22	0.11	0.21

Intersection Summary

HCM Signalized Intersection Capacity Analysis

4: Kerr Street & Shepherd Road

02/29/2024



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↕	↕	↕	↕
Traffic Volume (vph)	80	165	270	60	95	520
Future Volume (vph)	80	165	270	60	95	520
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4		5.2			5.2
Lane Util. Factor	1.00		0.95			0.95
Frb, ped/bikes	0.99		1.00			1.00
Flpb, ped/bikes	1.00		1.00			1.00
Frt	0.91		0.97			1.00
Flt Protected	0.98		1.00			0.99
Satd. Flow (prot)	1655		3455			3551
Flt Permitted	0.98		1.00			0.84
Satd. Flow (perm)	1655		3455			3007
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	82	170	278	62	98	536
RTOR Reduction (vph)	93	0	20	0	0	0
Lane Group Flow (vph)	159	0	320	0	0	634
Confl. Peds. (#/hr)	13	6		4	4	
Heavy Vehicles (%)	3%	1%	1%	2%	0%	1%
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases					6	
Actuated Green, G (s)	10.6		19.0			19.0
Effective Green, g (s)	10.6		19.0			19.0
Actuated g/C Ratio	0.26		0.47			0.47
Clearance Time (s)	5.4		5.2			5.2
Vehicle Extension (s)	3.0		3.5			3.5
Lane Grp Cap (vph)	436		1632			1421
v/s Ratio Prot	c0.10		0.09			
v/s Ratio Perm						c0.21
v/c Ratio	0.37		0.20			0.45
Uniform Delay, d1	12.1		6.2			7.1
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	0.5		0.1			0.3
Delay (s)	12.6		6.2			7.3
Level of Service	B		A			A
Approach Delay (s)	12.6		6.2			7.3
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	40.2	Sum of lost time (s)	14.6
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

5: Kerr Street & Wycroft Road

02/29/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↕	↕	↕	↕
Traffic Volume (vph)	5	85	190	250	530	125
Future Volume (vph)	5	85	190	250	530	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	75.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.872				0.974	
Flt Protected	0.997		0.950			
Satd. Flow (prot)	1592	0	1703	1900	1837	0
Flt Permitted	0.997		0.950			
Satd. Flow (perm)	1592	0	1703	1900	1837	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	561.6			442.6	98.1	
Travel Time (s)	40.4			31.9	7.1	
Confl. Peds. (#/hr)			5			5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	4%	6%	0%	0%	4%
Adj. Flow (vph)	5	90	202	266	564	133
Shared Lane Traffic (%)						
Lane Group Flow (vph)	95	0	202	266	697	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	61.7%
ICU Level of Service	B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

5: Kerr Street & Wycroft Road

02/29/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	5	85	190	250	530	125
Future Volume (Veh/h)	5	85	190	250	530	125
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	5	90	202	266	564	133
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1306	636	702			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1306	636	702			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	96	81	77			
cM capacity (veh/h)	136	472	873			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	95	202	266	697		
Volume Left	5	202	0	0		
Volume Right	90	0	0	133		
cSH	418	873	1700	1700		
Volume to Capacity	0.23	0.23	0.16	0.41		
Queue Length 95th (m)	6.6	6.8	0.0	0.0		
Control Delay (s)	16.1	10.4	0.0	0.0		
Lane LOS	C	B				
Approach Delay (s)	16.1	4.5	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay	2.9					
Intersection Capacity Utilization	61.7%		ICU Level of Service		B	
Analysis Period (min)	15					

Lanes, Volumes, Timings

6: Kerr Street & Prince Charles Drive

02/29/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	
Traffic Volume (vph)	5	0	5	5	0	75	5	500	5	40	395	5	
Future Volume (vph)	5	0	5	5	0	75	5	500	5	40	395	5	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt	0.932		0.873		0.999		0.999						
Flt Protected	0.976		0.997		0.995		0.995						
Satd. Flow (prot)	0	1728	0	0	1654	0	0	1876	0	0	1846	0	
Flt Permitted	0.976		0.997		0.995		0.995						
Satd. Flow (perm)	0	1728	0	0	1654	0	0	1876	0	0	1846	0	
Link Speed (k/h)	40		40		50		50						
Link Distance (m)	57.8		56.0		134.8		127.4						
Travel Time (s)	5.2		5.0		9.7		9.2						
Confl. Peds. (#/hr)	4	1		1	4		21	31		31	21		
Confl. Bikes (#/hr)									1	1			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Heavy Vehicles (%)	0%	50%	0%	0%	0%	0%	20%	1%	0%	5%	2%	4%	
Adj. Flow (vph)	5	0	5	5	0	79	5	526	5	42	416	5	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	10	0	0	84	0	0	536	0	0	463	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)	0.0		0.0		0.0		0.0		3.6				
Link Offset(m)	0.0		0.0		0.0		0.0		0.0				
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6				
Two way Left Turn Lane													
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (k/h)	24	14		24	14		24	14		24	14		
Sign Control	Stop		Stop		Free		Free		Free				
Intersection Summary													
Area Type:	Other												
Control Type:	Unsignalized												
Intersection Capacity Utilization	60.4%						ICU Level of Service B						
Analysis Period (min)	15												

HCM Unsignalized Intersection Capacity Analysis

6: Kerr Street & Prince Charles Drive

02/29/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	5	0	5	5	0	75	5	500	5	40	395	5
Future Volume (Veh/h)	5	0	5	5	0	75	5	500	5	40	395	5
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	0	5	5	0	79	5	526	5	42	416	5
Pedestrians	21			31			1			4		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	2			3			0			0		
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (m)							238					
pX, platoon unblocked	0.89	0.89	0.86	0.89	0.89	0.94	0.86					0.94
vC, conflicting volume	1145	1096	440	1078	1096	564	442					562
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	952	896	267	877	896	505	269					504
tC, single (s)	7.1	7.0	6.2	7.1	6.5	6.2	4.3					4.1
tC, 2 stage (s)												
tF (s)	3.5	4.5	3.3	3.5	4.0	3.3	2.4					2.2
p0 queue free %	97	100	99	98	100	85	100					96
cM capacity (veh/h)	165	189	654	216	227	520	1009					957
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	10	84	536	463								
Volume Left	5	5	5	42								
Volume Right	5	79	5	5								
cSH	263	480	1009	957								
Volume to Capacity	0.04	0.17	0.00	0.04								
Queue Length 95th (m)	0.9	4.8	0.1	1.0								
Control Delay (s)	19.2	14.1	0.1	1.3								
Lane LOS	C	B	A	A								
Approach Delay (s)	19.2	14.1	0.1	1.3								
Approach LOS	C	B										
Intersection Summary												
Average Delay	1.9											
Intersection Capacity Utilization	60.4%			ICU Level of Service			B					
Analysis Period (min)	15											

Lanes, Volumes, Timings

7: Kerr Street & Elmwood Road

02/29/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕			↕	↕	
Traffic Volume (vph)	30	10	5	480	360	45
Future Volume (vph)	30	10	5	480	360	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.965				0.985	
Fit Protected	0.964					
Satd. Flow (prot)	1723	0	0	1860	1825	0
Fit Permitted	0.964					
Satd. Flow (perm)	1723	0	0	1860	1825	0
Link Speed (k/h)	40				50	
Link Distance (m)	171.2				103.0 134.8	
Travel Time (s)	15.4				7.4 9.7	
Confl. Peds. (#/hr)	1	2	34			34
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	10%	20%	2%	2%	7%
Adj. Flow (vph)	32	11	5	505	379	47
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	0	0	510	426	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6				0.0	
Link Offset(m)	0.0				0.0	
Crosswalk Width(m)	1.6				1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24	14		
Sign Control	Stop			Free Free		
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	39.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

7: Kerr Street & Elmwood Road

02/29/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↕		↔	
Traffic Volume (veh/h)	30	10	5	480	360	45
Future Volume (Veh/h)	30	10	5	480	360	45
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	32	11	5	505	379	47
Pedestrians	34		2		1	
Lane Width (m)	3.6		3.6		3.6	
Walking Speed (m/s)	1.1		1.1		1.1	
Percent Blockage	3		0		0	
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)			103		262	
pX, platoon unblocked	0.92	0.97	0.97			
vC, conflicting volume	952	438	460			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	840	409	431			
tC, single (s)	6.4	6.3	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.4			
p0 queue free %	89	98	99			
cM capacity (veh/h)	300	589	979			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	43	510	426			
Volume Left	32	5	0			
Volume Right	11	0	47			
cSH	343	979	1700			
Volume to Capacity	0.13	0.01	0.25			
Queue Length 95th (m)	3.2	0.1	0.0			
Control Delay (s)	17.0	0.1	0.0			
Lane LOS	C	A				
Approach Delay (s)	17.0	0.1	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			39.9%		ICU Level of Service A	
Analysis Period (min)			15			

Lanes, Volumes, Timings

8: Kerr Street & Stewart Street

02/29/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↕		↔		↕		↔		↕	
Traffic Volume (vph)	35	25	5	20	35	70	5	380	20	40	300	30
Future Volume (vph)	35	25	5	20	35	70	5	380	20	40	300	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98		0.97		1.00		1.00		0.99		0.99	
Frt	0.990		0.925		0.993		0.989		0.995		0.995	
Fit Protected	0.974		0.992		0.999		0.995		0.927		0.927	
Satd. Flow (prot)	0	1679	0	0	1616	0	0	1846	0	0	1827	0
Fit Permitted	0.796		0.941		0.996		0.927		0.927		0.927	
Satd. Flow (perm)	0	1353	0	0	1527	0	0	1840	0	0	1699	0
Right Turn on Red			Yes		Yes		Yes		Yes		Yes	
Satd. Flow (RTOR)	5		76		4		9		50		50	
Link Speed (k/h)	40		40		50		50		103.0		103.0	
Link Distance (m)	95.6		60.6		165.0		103.0		7.4		7.4	
Travel Time (s)	8.6		5.5		11.9		7.4					
Confl. Peds. (#/hr)	20		15	15		20	35		25	25		35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Adj. Flow (vph)	38	27	5	22	38	76	5	413	22	43	326	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	70	0	0	136	0	0	440	0	0	402	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0		0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6		1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases	4		8		8		2		2		6	
Permitted Phases	4		8		8		2		2		6	

Lanes, Volumes, Timings
8: Kerr Street & Stewart Street

02/29/2024

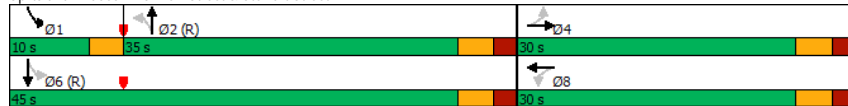


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		24.0	24.0		6.0	24.0	
Minimum Split (s)	30.0	30.0		30.0	30.0		32.0	32.0		10.0	32.0	
Total Split (s)	30.0	30.0		30.0	30.0		35.0	35.0		10.0	45.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		46.7%	46.7%		13.3%	60.0%	
Maximum Green (s)	24.6	24.6		24.6	24.6		29.6	29.6		7.0	39.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.0	3.3	
All-Red Time (s)	2.1	2.1		2.1	2.1		2.1	2.1		0.0	2.1	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.4			5.4			5.4			5.4	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
Recall Mode	None	None		None	None		C-Min	C-Min		None	C-Min	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0		
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		14.0	14.0		14.0		
Pedestrian Calls (#/hr)	20	20		20	20		35	35		35		
Act Effect Green (s)		15.2			15.2			53.2			53.2	
Actuated g/C Ratio		0.20			0.20			0.71			0.71	
v/c Ratio		0.25			0.37			0.34			0.33	
Control Delay		23.5			14.0			7.7			7.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		23.5			14.0			7.7			7.7	
LOS		C			B			A			A	
Approach Delay		23.5			14.0			7.7			7.7	
Approach LOS		C			B			A			A	

Intersection Summary

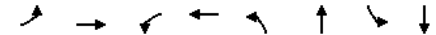
Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.37
 Intersection Signal Delay: 9.6 Intersection LOS: A
 Intersection Capacity Utilization 65.9% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 8: Kerr Street & Stewart Street



Timings
8: Kerr Street & Stewart Street

02/29/2024

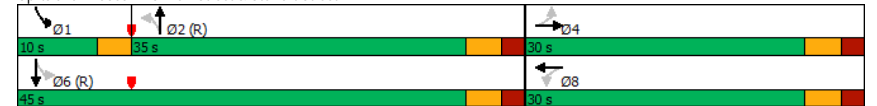


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕			↕		↕		↕
Traffic Volume (vph)	35	25		20	35	5	380	40	300
Future Volume (vph)	35	25		20	35	5	380	40	300
Turn Type	Perm	NA		Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6	
Permitted Phases	4			8		2	2	6	
Detector Phase	4	4		8	8	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0		10.0	10.0	24.0	24.0	6.0	24.0
Minimum Split (s)	30.0	30.0		30.0	30.0	32.0	32.0	10.0	32.0
Total Split (s)	30.0	30.0		30.0	30.0	35.0	35.0	10.0	45.0
Total Split (%)	40.0%	40.0%		40.0%	40.0%	46.7%	46.7%	13.3%	60.0%
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	3.3	3.0	3.3
All-Red Time (s)	2.1	2.1		2.1	2.1	2.1	2.1	0.0	2.1
Lost Time Adjust (s)		0.0			0.0		0.0		0.0
Total Lost Time (s)		5.4			5.4		5.4		5.4
Lead/Lag						Lag	Lag	Lead	
Lead-Lag Optimize?						Yes	Yes	Yes	
Recall Mode	None	None		None	None	C-Min	C-Min	None	C-Min
Act Effect Green (s)		15.2			15.2		53.2		53.2
Actuated g/C Ratio		0.20			0.20		0.71		0.71
v/c Ratio		0.25			0.37		0.34		0.33
Control Delay		23.5			14.0		7.7		7.7
Queue Delay		0.0			0.0		0.0		0.0
Total Delay		23.5			14.0		7.7		7.7
LOS		C			B		A		A
Approach Delay		23.5			14.0		7.7		7.7
Approach LOS		C			B		A		A

Intersection Summary

Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.37
 Intersection Signal Delay: 9.6 Intersection LOS: A
 Intersection Capacity Utilization 65.9% ICU Level of Service C
 Analysis Period (min) 15

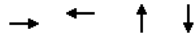
Splits and Phases: 8: Kerr Street & Stewart Street



Queues

8: Kerr Street & Stewart Street

02/29/2024



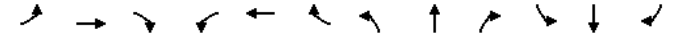
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	70	136	440	402
w/c Ratio	0.25	0.37	0.34	0.33
Control Delay	23.5	14.0	7.7	7.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.5	14.0	7.7	7.7
Queue Length 50th (m)	8.5	7.8	17.9	16.1
Queue Length 95th (m)	15.7	18.1	53.2	49.2
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)				
Base Capacity (vph)	447	551	1305	1207
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced w/c Ratio	0.16	0.25	0.34	0.33

Intersection Summary

HCM Signalized Intersection Capacity Analysis

8: Kerr Street & Stewart Street

02/29/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	35	25	5	20	35	70	5	380	20	40	300	30
Future Volume (vph)	35	25	5	20	35	70	5	380	20	40	300	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.4			5.4			5.4			5.4	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		1.00			0.97			1.00			0.99	
Flpb, ped/bikes		0.99			1.00			1.00			1.00	
Frt		0.99			0.92			0.99			0.99	
Flt Protected		0.97			0.99			1.00			0.99	
Satd. Flow (prot)		1656			1609			1847			1822	
Flt Permitted		0.80			0.94			1.00			0.93	
Satd. Flow (perm)		1354			1526			1841			1698	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	27	5	22	38	76	5	413	22	43	326	33
RTOR Reduction (vph)	0	4	0	0	63	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	66	0	0	73	0	0	439	0	0	399	0
Confl. Peds. (#/hr)	20		15	15		20	35		25	25		35
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2			1	6
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.2			13.2			51.0			51.0	
Effective Green, g (s)		13.2			13.2			51.0			51.0	
Actuated g/C Ratio		0.18			0.18			0.68			0.68	
Clearance Time (s)		5.4			5.4			5.4			5.4	
Vehicle Extension (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		238			268			1251			1154	
v/s Ratio Prot												
v/s Ratio Perm		c0.05			0.05			c0.24			0.24	
v/c Ratio		0.28			0.27			0.35			0.35	
Uniform Delay, d1		26.8			26.8			5.0			5.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.9			0.8			0.8			0.2	
Delay (s)		27.6			27.5			5.8			5.2	
Level of Service		C			C			A			A	
Approach Delay (s)		27.6			27.5			5.8			5.2	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	13.8
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

9: Speers Internal Road 1 & Speers Road

02/29/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (vph)	1360	15	0	865	0	20
Future Volume (vph)	1360	15	0	865	0	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.998		0.865			
Flt Protected						
Satd. Flow (prot)	3603	0	0	3610	0	1644
Flt Permitted						
Satd. Flow (perm)	3603	0	0	3610	0	1644
Link Speed (k/h)	60		60		20	
Link Distance (m)	147.2		113.4		44.5	
Travel Time (s)	8.8		6.8		8.0	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1388	15	0	883	0	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1403	0	0	883	0	20
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6		3.6		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	14		24		14	
Sign Control	Free		Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	48.1%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

9: Speers Internal Road 1 & Speers Road

02/29/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑		↑
Traffic Volume (veh/h)	1360	15	0	865	0	20
Future Volume (Veh/h)	1360	15	0	865	0	20
Sign Control	Free			Stop		
Grade	0%			0%		
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	1388	15	0	883	0	20
Pedestrians	1			1		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	147			347		
pX, platoon unblocked				0.84	0.86	0.84
vC, conflicting volume				1403	1838	702
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				1103	1467	271
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				100	100	97
cM capacity (veh/h)				539	104	617

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	925	478	442	442	20
Volume Left	0	0	0	0	0
Volume Right	0	15	0	0	20
cSH	1700	1700	1700	1700	617
Volume to Capacity	0.54	0.28	0.26	0.26	0.03
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.8
Control Delay (s)	0.0	0.0	0.0	0.0	11.0
Lane LOS	B				
Approach Delay (s)	0.0		0.0		11.0
Approach LOS					B


Intersection Summary

Average Delay	0.1	
Intersection Capacity Utilization	48.1%	ICU Level of Service A
Analysis Period (min)	15	

Lanes, Volumes, Timings

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/29/2024

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	0	20	0	0	15	0
Future Volume (vph)	0	20	0	0	15	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected						0.950
Satd. Flow (prot)	1644	0	1900	0	0	1805
Flt Permitted						0.950
Satd. Flow (perm)	1644	0	1900	0	0	1805
Link Speed (k/h)	20		20		20	
Link Distance (m)	67.5		49.5		44.5	
Travel Time (s)	12.2		8.9		8.0	
Confl. Peds. (#/hr)	8					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	25	0	0	19	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	25	0	0	0	0	19
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	14		24	
Sign Control	Stop		Free		Free	


Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	15.7%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/29/2024

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	0	20	0	0	15	0
Future Volume (Veh/h)	0	20	0	0	15	0
Sign Control	Stop		Free		Free	
Grade	0%					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	25	0	0	19	0
Pedestrians	2					
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0			1		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	40	8	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	40	8	0			
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			99	
cM capacity (veh/h)	964	1072			1636	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	25	0	19
Volume Left	0	0	19
Volume Right	25	0	0
cSH	1072	1700	1636
Volume to Capacity	0.02	0.00	0.01
Queue Length 95th (m)	0.5	0.0	0.3
Control Delay (s)	8.4	0.0	7.2
Lane LOS	A		A
Approach Delay (s)	8.4	0.0	7.2
Approach LOS	A		

Intersection Summary

Average Delay	7.9		
Intersection Capacity Utilization	15.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
12: Underground & Speers Internal Road

02/29/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (vph)	10	10	10	0	20	30
Future Volume (vph)	10	10	10	0	20	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.932			0.919		
Flt Protected			0.950	0.981		
Satd. Flow (prot)	1771	0	0	1805	1713	0
Flt Permitted			0.950	0.981		
Satd. Flow (perm)	1771	0	0	1805	1713	0
Link Speed (k/h)	20		20	20		
Link Distance (m)	67.5		44.6	38.9		
Travel Time (s)	12.2		8.0	7.0		
Confl. Peds. (#/hr)				10		
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	13	13	13	0	25	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	26	0	0	13	63	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0		0.0	3.6		
Link Offset(m)	0.0		0.0	0.0		
Crosswalk Width(m)	1.6		1.6	1.6		
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	17.2%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
12: Underground & Speers Internal Road

02/29/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (veh/h)	10	10	10	0	20	30
Future Volume (Veh/h)	10	10	10	0	20	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	13	13	13	0	25	38
Pedestrians	10			3		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	1			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			26		56	22
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			26		56	22
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	96
cM capacity (veh/h)			1601		941	1057

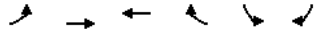
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	26	13	63
Volume Left	0	13	25
Volume Right	13	0	38
cSH	1700	1601	1008
Volume to Capacity	0.02	0.01	0.06
Queue Length 95th (m)	0.0	0.2	1.5
Control Delay (s)	0.0	7.3	8.8
Lane LOS		A	A
Approach Delay (s)	0.0	7.3	8.8
Approach LOS			A

Intersection Summary	
Average Delay	6.4
Intersection Capacity Utilization	17.2%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings

13: Speers Internal Road/30 Speers & Speers Internal Road 2

02/29/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑		↑	↑	
Traffic Volume (vph)	40	0	0	20	5	10
Future Volume (vph)	40	0	0	20	5	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.865	0.910		
Flt Protected		0.950		0.984		
Satd. Flow (prot)	0	1504	0	1644	1575	0
Flt Permitted		0.950		0.984		
Satd. Flow (perm)	0	1504	0	1644	1575	0
Link Speed (k/h)		20	20	20		
Link Distance (m)		44.6	43.4	49.2		
Travel Time (s)		8.0	7.8	8.9		
Confl. Peds. (#/hr)	2		2	7		
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63
Heavy Vehicles (%)	20%	0%	0%	0%	0%	12%
Adj. Flow (vph)	63	0	0	32	8	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	63	0	32	24	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0	3.6		
Link Offset(m)		0.0	0.0	0.0		
Crosswalk Width(m)		1.6	1.6	1.6		
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24			14	24	14
Sign Control		Stop	Stop		Free	

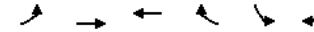
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.9%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

13: Speers Internal Road/30 Speers & Speers Internal Road 2

02/29/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑		↑	↑	
Traffic Volume (veh/h)	40	0	0	20	5	10
Future Volume (Veh/h)	40	0	0	20	5	10
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63
Hourly flow rate (vph)	63	0	0	32	8	16
Pedestrians		3	7		2	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.1	1.1		1.1	
Percent Blockage		0	1		0	
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	61	34	42	9	7	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	61	34	42	9	7	
tC, single (s)	7.3	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.7	4.0	4.0	3.3	2.2	
p0 queue free %	93	100	100	97	100	
cM capacity (veh/h)	852	850	842	1070	1616	

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	63	32	24
Volume Left	63	0	8
Volume Right	0	32	16
cSH	852	1070	1616
Volume to Capacity	0.07	0.03	0.00
Queue Length 95th (m)	1.8	0.7	0.1
Control Delay (s)	9.6	8.5	2.4
Lane LOS	A	A	A
Approach Delay (s)	9.6	8.5	2.4
Approach LOS	A	A	

Intersection Summary

Average Delay	7.8
Intersection Capacity Utilization	18.9%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/29/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (vph)	0	1380	0	15	840	0	25	0	40	0	0	0
Future Volume (vph)	0	1380	0	15	840	0	25	0	40	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt												
Flt Protected												
Satd. Flow (prot)	0	3539	0	0	3537	0	0	1709	0	0	1863	0
Flt Permitted												
Satd. Flow (perm)	0	3539	0	0	3537	0	0	1709	0	0	1863	0
Link Speed (k/h)	60											
Link Distance (m)	113.4											
Travel Time (s)	6.8											
Confl. Peds. (#/hr)	8											
Confl. Bikes (#/hr)	1											
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Heavy Vehicles (%)	2%											
Adj. Flow (vph)	0	1453	0	16	884	0	26	0	42	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1453	0	0	900	0	0	68	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.6											
Link Offset(m)	0.0											
Crosswalk Width(m)	1.6											
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24											
Sign Control	Free											

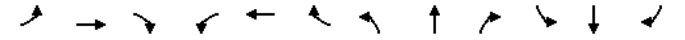
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	48.7%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/29/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations		↑↑			↑↑			↑↑			↑↑									
Traffic Volume (veh/h)	0	1380	0	15	840	0	25	0	40	0	0	0								
Future Volume (Veh/h)	0	1380	0	15	840	0	25	0	40	0	0	0								
Sign Control	Free																			
Grade	0%																			
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92								
Hourly flow rate (vph)	0	1453	0	16	884	0	26	0	42	0	0	0								
Pedestrians	4																			
Lane Width (m)	3.6																			
Walking Speed (m/s)	1.1																			
Percent Blockage	0																			
Right turn flare (veh)	1																			
Median type	None																			
Median storage (veh)																				
Upstream signal (m)	261																			
pX, platoon unblocked	0.95						0.85						0.88	0.88	0.85	0.88	0.88	0.95		
vC, conflicting volume	884						1461						1939	2377	738	1688	2377	446		
vC1, stage 1 conf vol																				
vC2, stage 2 conf vol																				
vCu, unblocked vol	769						1195						1528	2027	347	1243	2027	307		
tC, single (s)	4.1						4.1						7.5	6.5	6.9	7.5	6.5	6.9		
tC, 2 stage (s)																				
tF (s)	2.2						2.2						3.5	4.0	3.3	3.5	4.0	3.3		
p0 queue free %	100						97						62	100	92	100	100	100		
cM capacity (veh/h)	798						501						69	48	552	103	48	651		
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1														
Volume Total	969	484	311	589	68	0														
Volume Left	0	0	16	0	26	0														
Volume Right	0	0	0	0	42	0														
cSH	1700	1700	501	1700	150	1700														
Volume to Capacity	0.57	0.28	0.03	0.35	0.45	0.09														
Queue Length 95th (m)	0.0	0.0	0.8	0.0	15.7	0.0														
Control Delay (s)	0.0	0.0	1.1	0.0	47.5	0.0														
Lane LOS							A							E						
Approach Delay (s)	0.0						0.4						47.5							
Approach LOS							E							A						
Intersection Summary																				
Average Delay	1.5																			
Intersection Capacity Utilization	48.7%																			
ICU Level of Service	A																			
Analysis Period (min)	15																			

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

02/29/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖ ↗			↖ ↗			↖ ↗			↖ ↗		
Traffic Volume (vph)	65	580	135	300	815	510	140	155	235	295	285	60
Future Volume (vph)	65	580	135	300	815	510	140	155	235	295	285	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	105.0		0.0	75.0		100.0	50.0		45.0	0.0		0.0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99		1.00		0.94	0.97		0.93	0.96	0.99	
Frt		0.972				0.850			0.850		0.974	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3431	0	1752	3539	1583	1787	1900	1599	1787	1828	0
Flt Permitted	0.282			0.245			0.287			0.497		
Satd. Flow (perm)	531	3431	0	450	3539	1485	525	1900	1486	896	1828	0
Right Turn on Red			Yes			Yes		Yes			Yes	
Satd. Flow (RTOR)		28				537			247		9	
Link Speed (kh)		60			60			50			50	
Link Distance (m)		235.8			147.2			127.4			167.2	
Travel Time (s)		14.1			8.8			9.2			12.0	
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Adj. Flow (vph)	68	611	142	316	858	537	147	163	247	311	300	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	68	753	0	316	858	537	147	163	247	311	363	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

02/29/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2		2	4		4	8		
Detector Phase	1	6		5	2	2	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	7.0	25.0		7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0	
Minimum Split (s)	10.0	30.9		10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3	
Total Split (s)	12.0	54.0		12.0	54.0	54.0	12.0	38.0	38.0	16.0	42.0	
Total Split (%)	10.0%	45.0%		10.0%	45.0%	45.0%	10.0%	31.7%	31.7%	13.3%	35.0%	
Maximum Green (s)	9.0	48.1		9.0	48.1	48.1	9.0	31.7	31.7	13.0	35.7	
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	
All-Red Time (s)	0.0	2.2		0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	5.5		2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	
Walk Time (s)		7.0			7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		14.0			14.0	14.0		14.0	14.0		14.0	
Pedestrian Calls (#/hr)		15			15	15		35	35		35	
Act Effect Green (s)	59.4	48.9		68.5	57.7	57.7	36.3	23.4	23.4	44.9	28.9	
Actuated g/C Ratio	0.50	0.41		0.57	0.48	0.48	0.30	0.20	0.20	0.37	0.24	
v/c Ratio	0.20	0.53		0.77	0.50	0.54	0.57	0.44	0.51	0.70	0.81	
Control Delay	14.5	28.0		31.3	24.4	4.2	34.0	44.8	8.2	37.3	56.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	14.5	28.0		31.3	24.4	4.2	34.0	44.8	8.2	37.3	56.1	
LOS	B	C		C	C	A	C	D	A	D	E	
Approach Delay		26.9			19.4			25.7			47.4	
Approach LOS		C			B			C			D	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 49 (41%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 27.0

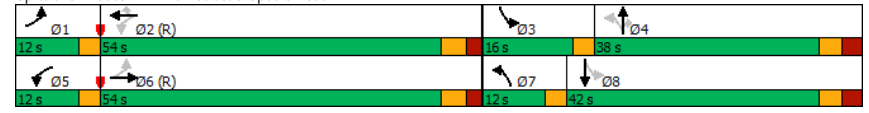
Intersection LOS: C

Intersection Capacity Utilization 85.3%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 1: Kerr Street & Speers Road



Timings
1: Kerr Street & Speers Road

02/29/2024

	↖	→	↙	←	↘	↖	↙	↘	↖	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	65	580	300	815	510	140	155	235	295	285
Future Volume (vph)	65	580	300	815	510	140	155	235	295	285
Turn Type	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	1	6	5	2		7	4		3	8
Permitted Phases	6		2		2	4		4	8	
Detector Phase	1	6	5	2	2	7	4	4	3	8
Switch Phase										
Minimum Initial (s)	7.0	25.0	7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0
Minimum Split (s)	10.0	30.9	10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3
Total Split (s)	12.0	54.0	12.0	54.0	54.0	12.0	38.0	38.0	16.0	42.0
Total Split (%)	10.0%	45.0%	10.0%	45.0%	45.0%	10.0%	31.7%	31.7%	13.3%	35.0%
Yellow Time (s)	3.0	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3
All-Red Time (s)	0.0	2.2	0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	None	C-Min	C-Min	None	None	None	None	None
Act Effct Green (s)	59.4	48.9	68.5	57.7	57.7	36.3	23.4	23.4	44.9	28.9
Actuated g/C Ratio	0.50	0.41	0.57	0.48	0.48	0.30	0.20	0.20	0.37	0.24
v/c Ratio	0.20	0.53	0.77	0.50	0.54	0.57	0.44	0.51	0.70	0.81
Control Delay	14.5	28.0	31.3	24.4	4.2	34.0	44.8	8.2	37.3	56.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.5	28.0	31.3	24.4	4.2	34.0	44.8	8.2	37.3	56.1
LOS	B	C	C	C	A	C	D	A	D	E
Approach Delay		26.9		19.4			25.7			47.4
Approach LOS		C		B			C			D

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 49 (41%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.81
 Intersection Signal Delay: 27.0 Intersection LOS: C
 Intersection Capacity Utilization 85.3% ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 1: Kerr Street & Speers Road



Queues
1: Kerr Street & Speers Road

02/29/2024

	↖	→	↙	←	↘	↖	↙	↘	↖	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	68	753	316	858	537	147	163	247	311	363
v/c Ratio	0.20	0.53	0.77	0.50	0.54	0.57	0.44	0.51	0.70	0.81
Control Delay	14.5	28.0	31.3	24.4	4.2	34.0	44.8	8.2	37.3	56.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.5	28.0	31.3	24.4	4.2	34.0	44.8	8.2	37.3	56.1
Queue Length 50th (m)	7.1	72.1	38.6	75.9	0.0	22.6	33.9	0.0	52.9	78.7
Queue Length 95th (m)	14.9	86.3	#92.6	103.5	21.7	35.1	50.0	19.4	73.7	106.1
Internal Link Dist (m)		211.8		123.2		103.4			143.2	
Turn Bay Length (m)	105.0		75.0		100.0	50.0		45.0		
Base Capacity (vph)	364	1447	412	1700	992	263	501	574	447	550
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.52	0.77	0.50	0.54	0.56	0.33	0.43	0.70	0.66

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Kerr Street & Speers Road

02/29/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	65	580	135	300	815	510	140	155	235	295	285	60
Future Volume (vph)	65	580	135	300	815	510	140	155	235	295	285	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frb, ped/bikes	1.00	0.99		1.00	1.00	0.94	1.00	1.00	0.93	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	0.98	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1799	3430		1751	3539	1485	1775	1900	1486	1753	1828	
Flt Permitted	0.28	1.00		0.24	1.00	1.00	0.29	1.00	1.00	0.50	1.00	
Satd. Flow (perm)	534	3430		451	3539	1485	536	1900	1486	918	1828	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	68	611	142	316	858	537	147	163	247	311	300	63
RTOR Reduction (vph)	0	17	0	0	0	282	0	0	199	0	7	0
Lane Group Flow (vph)	68	736	0	316	858	255	147	163	48	311	356	0
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2			4			4	8	
Actuated Green, G (s)	55.1	48.9		66.2	57.0	57.0	33.0	23.4	23.4	41.6	29.0	
Effective Green, g (s)	55.1	48.9		66.2	57.0	57.0	33.0	23.4	23.4	41.6	29.0	
Actuated g/C Ratio	0.46	0.41		0.55	0.48	0.48	0.28	0.19	0.19	0.35	0.24	
Clearance Time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Vehicle Extension (s)	2.5	5.5		2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	
Lane Grp Cap (vph)	310	1397		403	1681	705	246	370	289	424	441	
v/s Ratio Prot	0.01	0.21		c0.09	0.24		0.05	0.09		c0.09	c0.19	
v/s Ratio Perm	0.09			c0.34		0.17	0.12		0.03	0.16		
v/c Ratio	0.22	0.53		0.78	0.51	0.36	0.60	0.44	0.17	0.73	0.81	
Uniform Delay, d1	18.5	26.8		17.0	21.8	20.0	35.0	42.5	40.2	32.0	42.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	1.4		9.3	1.1	1.4	3.2	1.1	0.4	6.1	11.0	
Delay (s)	18.7	28.3		26.3	22.9	21.4	38.2	43.7	40.6	38.0	53.8	
Level of Service	B	C		C	C	C	D	D	D	D	D	
Approach Delay (s)		27.5			23.1			40.9			46.5	
Approach LOS		C			C			D			D	

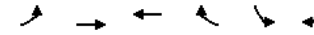
Intersection Summary			
HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

2: Speers Road & Cross Avenue

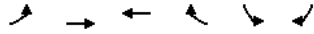
02/29/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	270	820	1200	15	10	420
Future Volume (vph)	270	820	1200	15	10	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	80.0			0.0	45.0	0.0
Storage Lanes	1			0	1	2
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	0.88
Ped Bike Factor	1.00		1.00			
Frt			0.998			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1703	3610	3566	0	1805	2733
Flt Permitted	0.146				0.950	
Satd. Flow (perm)	261	3610	3566	0	1805	2733
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			1			319
Link Speed (k/h)		60	60		48	
Link Distance (m)		233.1	101.5		84.0	
Travel Time (s)		14.0	6.1		6.3	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Adj. Flow (vph)	281	854	1250	16	10	438
Shared Lane Traffic (%)						
Lane Group Flow (vph)	281	854	1266	0	10	438
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
2: Speers Road & Cross Avenue

02/29/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	pm+pt	NA	NA	Prot	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Detector Phase	5	2	6		4	4
Switch Phase						
Minimum Initial (s)	6.0	38.0	38.0		10.0	10.0
Minimum Split (s)	12.0	47.6	47.6		15.8	15.8
Total Split (s)	17.0	102.0	85.0		38.0	38.0
Total Split (%)	12.1%	72.9%	60.7%		27.1%	27.1%
Maximum Green (s)	11.0	95.4	78.4		32.2	32.2
Yellow Time (s)	4.0	3.7	3.7		3.3	3.3
All-Red Time (s)	2.0	2.9	2.9		2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6		5.8	5.8
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Recall Mode	None	C-Min	C-Min		None	None
Walk Time (s)		10.0	10.0			
Flash Dont Walk (s)		31.0	31.0			
Pedestrian Calls (#/hr)		5	5			
Act Effect Green (s)	114.6	114.0	86.3		13.6	13.6
Actuated g/C Ratio	0.82	0.81	0.62		0.10	0.10
v/c Ratio	0.64	0.29	0.58		0.06	0.79
Control Delay	18.2	3.7	18.1		55.1	27.6
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	18.2	3.7	18.1		55.1	27.6
LOS	B	A	B		E	C
Approach Delay		7.3	18.1		28.2	
Approach LOS		A	B		C	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 13 (9%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 15.4 Intersection LOS: B
 Intersection Capacity Utilization 72.8% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: Speers Road & Cross Avenue



Timings
2: Speers Road & Cross Avenue

02/29/2024

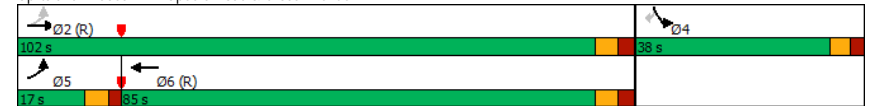


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↕↕	↕↕	↔	↕↕
Traffic Volume (vph)	270	820	1200	10	420
Future Volume (vph)	270	820	1200	10	420
Turn Type	pm+pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2				4
Detector Phase	5	2	6	4	4
Switch Phase					
Minimum Initial (s)	6.0	38.0	38.0	10.0	10.0
Minimum Split (s)	12.0	47.6	47.6	15.8	15.8
Total Split (s)	17.0	102.0	85.0	38.0	38.0
Total Split (%)	12.1%	72.9%	60.7%	27.1%	27.1%
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	None	None
Act Effect Green (s)	114.6	114.0	86.3	13.6	13.6
Actuated g/C Ratio	0.82	0.81	0.62	0.10	0.10
v/c Ratio	0.64	0.29	0.58	0.06	0.79
Control Delay	18.2	3.7	18.1	55.1	27.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.2	3.7	18.1	55.1	27.6
LOS	B	A	B	E	C
Approach Delay		7.3	18.1	28.2	
Approach LOS		A	B	C	

Intersection Summary

Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 13 (9%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 15.4 Intersection LOS: B
 Intersection Capacity Utilization 72.8% ICU Level of Service C
 Analysis Period (min) 15

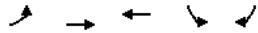
Splits and Phases: 2: Speers Road & Cross Avenue



Queues

2: Speers Road & Cross Avenue

02/29/2024



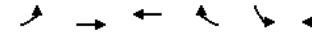
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	281	854	1266	10	438
w/c Ratio	0.64	0.29	0.58	0.06	0.79
Control Delay	18.2	3.7	18.1	55.1	27.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.2	3.7	18.1	55.1	27.6
Queue Length 50th (m)	17.8	23.4	97.9	2.6	18.1
Queue Length 95th (m)	53.2	40.2	150.2	7.8	36.9
Internal Link Dist (m)		209.1	77.5	60.0	
Turn Bay Length (m)	80.0		45.0		
Base Capacity (vph)	436	2938	2210	415	874
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.64	0.29	0.57	0.02	0.50

Intersection Summary

HCM Signalized Intersection Capacity Analysis

2: Speers Road & Cross Avenue

02/29/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕↕	↕↕		↔	↕↕
Traffic Volume (vph)	270	820	1200	15	10	420
Future Volume (vph)	270	820	1200	15	10	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.6	6.6		5.8	5.8
Lane Util. Factor	1.00	0.95	0.95		1.00	0.88
Frbp, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1703	3610	3567		1805	2733
Flt Permitted	0.15	1.00	1.00		0.95	1.00
Satd. Flow (perm)	262	3610	3567		1805	2733
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	281	854	1250	16	10	438
RTOR Reduction (vph)	0	0	0	0	0	288
Lane Group Flow (vph)	281	854	1266		10	150
Confl. Peds. (#/hr)	5			5		
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	114.0	114.0	86.3		13.6	13.6
Effective Green, g (s)	114.0	114.0	86.3		13.6	13.6
Actuated g/C Ratio	0.81	0.81	0.62		0.10	0.10
Clearance Time (s)	6.0	6.6	6.6		5.8	5.8
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Lane Grp Cap (vph)	436	2939	2198		175	265
v/s Ratio Prot	c0.10	0.24	0.35		0.01	
v/s Ratio Perm	c0.42					c0.05
w/c Ratio	0.64	0.29	0.58		0.06	0.57
Uniform Delay, d1	15.9	3.2	16.0		57.4	60.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.4	0.3	1.1		0.1	2.8
Delay (s)	19.3	3.4	17.1		57.5	63.1
Level of Service	B	A	B		E	E
Approach Delay (s)		7.4	17.1		63.0	
Approach LOS		A	B		E	

Intersection Summary

HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings
3: St. Augustine Drive & Speers Road

02/29/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕			↕				↕		↕	
Traffic Volume (vph)	10	745	25	0	995	25	5	0	25	5	0	0
Future Volume (vph)	10	745	25	0	995	25	5	0	25	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		1	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995			0.996				0.865			
Flt Protected	0.950						0.950				0.950	
Satd. Flow (prot)	1805	3553	0	0	3561	0	0	0	1644	0	1805	0
Flt Permitted	0.950						0.950				0.950	
Satd. Flow (perm)	1805	3553	0	0	3561	0	0	0	1644	0	1805	0
Link Speed (k/h)		60			60				40			30
Link Distance (m)		248.1			235.8				188.1			117.6
Travel Time (s)		14.9			14.1				16.9			14.1
Confl. Peds. (#/hr)	8		5	5		8	1		1	1		1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	10	776	26	0	1036	26	5	0	26	5	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	802	0	0	1062	0	0	5	26	0	5	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6				0.0			0.0
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		1.6			1.6				1.6			1.6
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free				Stop			Stop

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
3: St. Augustine Drive & Speers Road

02/29/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕			↕				↕		↕	
Traffic Volume (veh/h)	10	745	25	0	995	25	5	0	25	5	0	0
Future Volume (Veh/h)	10	745	25	0	995	25	5	0	25	5	0	0
Sign Control		Free			Free				Stop			Stop
Grade		0%			0%				0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	10	776	26	0	1036	26	5	0	26	5	0	0
Pedestrians		1			1				5			8
Lane Width (m)		3.6			3.6				3.6			3.6
Walking Speed (m/s)		1.1			1.1				1.1			1.1
Percent Blockage		0			0				0			1
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)					236							
pX, platoon unblocked	0.83						0.83	0.83		0.83	0.83	0.83
vC, conflicting volume	1070				807		1333	1884	407	1492	1884	540
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	681				807		997	1659	407	1188	1659	44
tC, single (s)	4.1				4.1		7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2				2.2		3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99				100		97	100	96	96	100	100
cM capacity (veh/h)	761				823		163	80	596	113	80	844

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	10	517	285	691	371	31	5
Volume Left	10	0	0	0	0	5	5
Volume Right	0	0	26	0	26	26	0
cSH	761	1700	1700	1700	1700	418	113
Volume to Capacity	0.01	0.30	0.17	0.41	0.22	0.07	0.04
Queue Length 95th (m)	0.3	0.0	0.0	0.0	0.0	1.8	1.0
Control Delay (s)	9.8	0.0	0.0	0.0	0.0	14.3	38.3
Lane LOS	A					B	E
Approach Delay (s)	0.1			0.0		14.3	38.3
Approach LOS						B	E

Intersection Summary	
Average Delay	0.4
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min)	15

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

02/29/2024

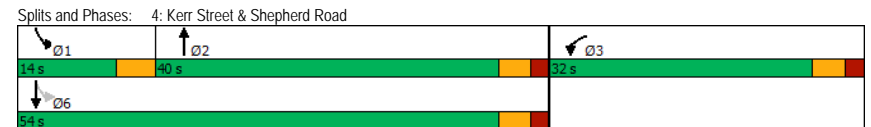
	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙		↖			↘
Traffic Volume (vph)	100	150	600	125	170	540
Future Volume (vph)	100	150	600	125	170	540
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor	0.98		1.00			1.00
Frt	0.919		0.974			
Flt Protected	0.980					0.988
Satd. Flow (prot)	1663	0	3459	0	0	3540
Flt Permitted	0.980					0.645
Satd. Flow (perm)	1654	0	3459	0	0	2310
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	91		34			
Link Speed (kh)	50		50			50
Link Distance (m)	265.3		167.2			26.5
Travel Time (s)	19.1		12.0			1.9
Confl. Peds. (#/hr)	13	6		4	4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	1%	1%	2%	0%	1%
Adj. Flow (vph)	103	155	619	129	175	557
Shared Lane Traffic (%)						
Lane Group Flow (vph)	258	0	748	0	0	732
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	1.6		1.6			1.6
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (kh)	24	14		14	24	
Number of Detectors	1		2		1	2
Detector Template	Left		Thru		Left	Thru
Leading Detector (m)	2.0		10.0		2.0	10.0
Trailing Detector (m)	0.0		0.0		0.0	0.0
Detector 1 Position(m)	0.0		0.0		0.0	0.0
Detector 1 Size(m)	2.0		0.6		2.0	0.6
Detector 1 Type	CI+Ex		CI+Ex		CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0		0.0	0.0
Detector 1 Queue (s)	0.0		0.0		0.0	0.0
Detector 1 Delay (s)	0.0		0.0		0.0	0.0
Detector 2 Position(m)			9.4			9.4
Detector 2 Size(m)			0.6			0.6
Detector 2 Type			CI+Ex			CI+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases						6

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

02/29/2024

	↙	↖	↑	↗	↘	↓
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Detector Phase					1	6
Switch Phase						
Minimum Initial (s)	10.0		18.0		7.0	18.0
Minimum Split (s)	31.4		28.2		11.0	28.2
Total Split (s)	32.0		40.0		14.0	54.0
Total Split (%)	37.2%		46.5%		16.3%	62.8%
Maximum Green (s)	26.6		34.8		10.0	48.8
Yellow Time (s)	3.3		3.3		4.0	3.3
All-Red Time (s)	2.1		1.9		0.0	1.9
Lost Time Adjust (s)	0.0		0.0			0.0
Total Lost Time (s)	5.4		5.2			5.2
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.5		2.5	3.5
Recall Mode	None		Min		None	Min
Walk Time (s)	10.0		10.0			10.0
Flash Dont Walk (s)	16.0		13.0			13.0
Pedestrian Calls (#/hr)	0		5			5
Act Effect Green (s)	12.4		24.2			24.2
Actuated g/C Ratio	0.26		0.51			0.51
v/c Ratio	0.51		0.42			0.63
Control Delay	15.1		7.8			11.3
Queue Delay	0.0		0.0			0.0
Total Delay	15.1		7.8			11.3
LOS	B		A			B
Approach Delay	15.1		7.8			11.3
Approach LOS	B		A			B

Intersection Summary	
Area Type:	Other
Cycle Length:	86
Actuated Cycle Length:	47.7
Natural Cycle:	75
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.63
Intersection Signal Delay:	10.4
Intersection Capacity Utilization:	70.0%
Intersection LOS:	B
ICU Level of Service:	C
Analysis Period (min):	15



Timings
4: Kerr Street & Shepherd Road

02/29/2024

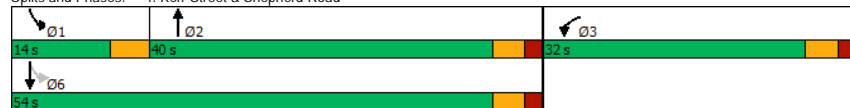
	↙	↑	↘	↓
Lane Group	WBL	NBT	SBL	SBT
Lane Configurations	↔	↕	↔	↕
Traffic Volume (vph)	100	600	170	540
Future Volume (vph)	100	600	170	540
Turn Type	Prot	NA	pm+pt	NA
Protected Phases	3	2	1	6
Permitted Phases			6	
Detector Phase	3	2	1	6
Switch Phase				
Minimum Initial (s)	10.0	18.0	7.0	18.0
Minimum Split (s)	31.4	28.2	11.0	28.2
Total Split (s)	32.0	40.0	14.0	54.0
Total Split (%)	37.2%	46.5%	16.3%	62.8%
Yellow Time (s)	3.3	3.3	4.0	3.3
All-Red Time (s)	2.1	1.9	0.0	1.9
Lost Time Adjust (s)	0.0	0.0		0.0
Total Lost Time (s)	5.4	5.2		5.2
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	None	Min	None	Min
Act Effct Green (s)	12.4	24.2		24.2
Actuated g/C Ratio	0.26	0.51		0.51
v/c Ratio	0.51	0.42		0.63
Control Delay	15.1	7.8		11.3
Queue Delay	0.0	0.0		0.0
Total Delay	15.1	7.8		11.3
LOS	B	A		B
Approach Delay	15.1	7.8		11.3
Approach LOS	B	A		B

Intersection Summary

Cycle Length: 86
 Actuated Cycle Length: 47.7
 Natural Cycle: 75
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.63
 Intersection Signal Delay: 10.4
 Intersection Capacity Utilization 70.0%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service C

Splits and Phases: 4: Kerr Street & Shepherd Road



Queues
4: Kerr Street & Shepherd Road

02/29/2024

	↙	↑	↓
Lane Group	WBL	NBT	SBT
Lane Group Flow (vph)	258	748	732
v/c Ratio	0.51	0.42	0.63
Control Delay	15.1	7.8	11.3
Queue Delay	0.0	0.0	0.0
Total Delay	15.1	7.8	11.3
Queue Length 50th (m)	10.3	15.1	17.9
Queue Length 95th (m)	35.7	33.5	42.1
Internal Link Dist (m)	241.3	143.2	2.5
Turn Bay Length (m)			
Base Capacity (vph)	1007	2673	2160
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.26	0.28	0.34

Intersection Summary

--

HCM Signalized Intersection Capacity Analysis

4: Kerr Street & Shepherd Road

02/29/2024



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↕	↕	↕	↕
Traffic Volume (vph)	100	150	600	125	170	540
Future Volume (vph)	100	150	600	125	170	540
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4		5.2			5.2
Lane Util. Factor	1.00		0.95			0.95
Frb, ped/bikes	0.99		1.00			1.00
Flpb, ped/bikes	1.00		1.00			1.00
Frt	0.92		0.97			1.00
Flt Protected	0.98		1.00			0.99
Satd. Flow (prot)	1666		3461			3539
Flt Permitted	0.98		1.00			0.65
Satd. Flow (perm)	1666		3461			2311
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	103	155	619	129	175	557
RTOR Reduction (vph)	67	0	17	0	0	0
Lane Group Flow (vph)	191	0	731	0	0	732
Confl. Peds. (#/hr)	13	6		4	4	
Heavy Vehicles (%)	3%	1%	1%	2%	0%	1%
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases					6	
Actuated Green, G (s)	12.4		24.2			24.2
Effective Green, g (s)	12.4		24.2			24.2
Actuated g/C Ratio	0.26		0.51			0.51
Clearance Time (s)	5.4		5.2			5.2
Vehicle Extension (s)	3.0		3.5			3.5
Lane Grp Cap (vph)	437		1774			1184
v/s Ratio Prot	c0.11		0.21			
v/s Ratio Perm						c0.32
v/c Ratio	0.44		0.41			0.62
Uniform Delay, d1	14.5		7.1			8.2
Progression Factor	1.00		1.00			1.00
Incremental Delay, d2	0.7		0.2			1.0
Delay (s)	15.2		7.3			9.2
Level of Service	B		A			A
Approach Delay (s)	15.2		7.3			9.2
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	47.2	Sum of lost time (s)	14.6
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

5: Kerr Street & Wycroft Road

02/29/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↕	↕	↕	↕
Traffic Volume (vph)	25	135	115	635	575	110
Future Volume (vph)	25	135	115	635	575	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	75.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.886				0.978	
Flt Protected	0.992		0.950			
Satd. Flow (prot)	1616	0	1703	1900	1846	0
Flt Permitted	0.992		0.950			
Satd. Flow (perm)	1616	0	1703	1900	1846	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	561.6			442.6	98.1	
Travel Time (s)	40.4			31.9	7.1	
Confl. Peds. (#/hr)			5			5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	4%	6%	0%	0%	4%
Adj. Flow (vph)	27	144	122	676	612	117
Shared Lane Traffic (%)						
Lane Group Flow (vph)	171	0	122	676	729	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	63.1%
ICU Level of Service	B
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

5: Kerr Street & Wycroft Road

02/29/2024

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔		↔	
Traffic Volume (veh/h)	25	135	115	635	575	110
Future Volume (Veh/h)	25	135	115	635	575	110
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	27	144	122	676	612	117
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1596	676	734			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1596	676	734			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	73	68	86			
cM capacity (veh/h)	101	448	849			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	171	122	676	729		
Volume Left	27	122	0	0		
Volume Right	144	0	0	117		
cSH	291	849	1700	1700		
Volume to Capacity	0.59	0.14	0.40	0.43		
Queue Length 95th (m)	26.4	3.8	0.0	0.0		
Control Delay (s)	33.6	9.9	0.0	0.0		
Lane LOS	D	A				
Approach Delay (s)	33.6	1.5	0.0			
Approach LOS	D					
Intersection Summary						
Average Delay			4.1			
Intersection Capacity Utilization			63.1%		ICU Level of Service B	
Analysis Period (min)	15					

Lanes, Volumes, Timings

6: Kerr Street & Prince Charles Drive

02/29/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔		↔		↔		↔		↔	
Traffic Volume (vph)	10	0	10	10	0	30	5	495	10	20	670	25
Future Volume (vph)	10	0	10	10	0	30	5	495	10	20	670	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.932		0.900		0.997		0.995					
Flt Protected	0.976		0.987		0.999							
Satd. Flow (prot)	0	1728	0	0	1688	0	0	1873	0	0	1849	0
Flt Permitted	0.976		0.987		0.999							
Satd. Flow (perm)	0	1728	0	0	1688	0	0	1873	0	0	1849	0
Link Speed (k/h)	40		40		50		50					
Link Distance (m)	57.8		56.0		134.8		127.4					
Travel Time (s)	5.2		5.0		9.7		9.2					
Confl. Peds. (#/hr)	4	1		1	4	21	31		31			
Confl. Bikes (#/hr)							1					
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	50%	0%	0%	0%	0%	20%	1%	0%	5%	2%	4%
Adj. Flow (vph)	11	0	11	11	0	32	5	521	11	21	705	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	22	0	0	43	0	0	537	0	0	752	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0		0.0		0.0		0.0		3.6			
Link Offset(m)	0.0		0.0		0.0		0.0		0.0			
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6			
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14		24	14		24	14		24	14	
Sign Control	Stop		Stop		Free		Free		Free			
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 60.7%	ICU Level of Service B											
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis

6: Kerr Street & Prince Charles Drive

02/29/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	10	0	10	10	0	30	5	495	10	20	670	25
Future Volume (Veh/h)	10	0	10	10	0	30	5	495	10	20	670	25
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	0	11	11	0	32	5	521	11	21	705	26
Pedestrians	21			31			1			4		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	2			3			0			0		
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (m)							238			127		
pX, platoon unblocked	0.74	0.74	0.71	0.74	0.74	0.94	0.71				0.94	
vC, conflicting volume	1354	1354	740	1340	1362	562	752				563	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1132	1133	437	1113	1143	505	454				507	
tC, single (s)	7.1	7.0	6.2	7.1	6.5	6.2	4.3				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.5	3.3	3.5	4.0	3.3	2.4				2.2	
p0 queue free %	91	100	97	91	100	94	99				98	
cM capacity (veh/h)	117	114	437	124	139	522	714				956	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	22	43	537	752								
Volume Left	11	11	5	21								
Volume Right	11	32	11	26								
cSH	185	287	714	956								
Volume to Capacity	0.12	0.15	0.01	0.02								
Queue Length 95th (m)	3.0	4.0	0.2	0.5								
Control Delay (s)	27.1	19.7	0.2	0.6								
Lane LOS	D	C	A	A								
Approach Delay (s)	27.1	19.7	0.2	0.6								
Approach LOS	D	C										
Intersection Summary												
Average Delay	1.5											
Intersection Capacity Utilization	60.7%			ICU Level of Service	B							
Analysis Period (min)	15											

Lanes, Volumes, Timings

7: Kerr Street & Elmwood Road

02/29/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	15	10	5	495	650	40
Future Volume (vph)	15	10	5	495	650	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.945				0.992	
Fit Protected	0.971					
Satd. Flow (prot)	1675	0	0	1860	1843	0
Fit Permitted	0.971					
Satd. Flow (perm)	1675	0	0	1860	1843	0
Link Speed (k/h)	40					
Link Distance (m)	171.2				103.0	134.8
Travel Time (s)	15.4				7.4	9.7
Confl. Peds. (#/hr)	1	2	34			34
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	10%	20%	2%	2%	7%
Adj. Flow (vph)	16	11	5	521	684	42
Shared Lane Traffic (%)						
Lane Group Flow (vph)	27	0	0	526	726	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6				0.0	0.0
Link Offset(m)	0.0				0.0	0.0
Crosswalk Width(m)	1.6				1.6	1.6
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24	14		
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	47.5%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

7: Kerr Street & Elmwood Road

02/29/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔		
Traffic Volume (veh/h)	15	10	5	495	650	40
Future Volume (Veh/h)	15	10	5	495	650	40
Sign Control	Stop			Free		Free
Grade	0%			0%		0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	11	5	521	684	42
Pedestrians	34			2		1
Lane Width (m)	3.6			3.6		3.6
Walking Speed (m/s)	1.1			1.1		1.1
Percent Blockage	3			0		0
Right turn flare (veh)						
Median type			None	None		
Median storage (veh)						
Upstream signal (m)			103	262		
pX, platoon unblocked	0.80	0.76	0.76			
vC, conflicting volume	1271	741	760			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	963	500	525			
tC, single (s)	6.4	6.3	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.4			
p0 queue free %	93	97	99			
cM capacity (veh/h)	221	408	703			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	27	526	726			
Volume Left	16	5	0			
Volume Right	11	0	42			
cSH	272	703	1700			
Volume to Capacity	0.10	0.01	0.43			
Queue Length 95th (m)	2.5	0.2	0.0			
Control Delay (s)	19.7	0.2	0.0			
Lane LOS	C	A				
Approach Delay (s)	19.7	0.2	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			47.5%		ICU Level of Service A	
Analysis Period (min)			15			

Lanes, Volumes, Timings

8: Kerr Street & Stewart Street

02/29/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Volume (vph)	50	10	15	10	15	75	10	375	15	55	555	50
Future Volume (vph)	50	10	15	10	15	75	10	375	15	55	555	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.97			0.96			1.00			0.99		
Frt	0.973			0.898			0.995			0.990		
Flt Protected	0.968			0.995			0.999			0.996		
Satd. Flow (prot)	0	1705	0	0	1577	0	0	1856	0	0	1831	0
Flt Permitted	0.771			0.967			0.982			0.935		
Satd. Flow (perm)	0	1333	0	0	1530	0	0	1823	0	0	1716	0
Right Turn on Red							Yes	Yes		Yes		Yes
Satd. Flow (RTOR)	16			82			3			8		
Link Speed (k/h)	40			40			50			50		
Link Distance (m)	95.6			60.6			165.0			103.0		
Travel Time (s)	8.6			5.5			11.9			7.4		
Confl. Peds. (#/hr)	20		15		15		20		35		25	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Adj. Flow (vph)	54	11	16	11	16	82	11	408	16	60	603	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	81	0	0	109	0	0	435	0	0	717	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0			0.0			0.0			0.0		
Link Offset(m)	0.0			0.0			0.0			0.0		
Crosswalk Width(m)	1.6			1.6			1.6			1.6		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2			1	6
Permitted Phases		4			8			2			6	

Lanes, Volumes, Timings
8: Kerr Street & Stewart Street

02/29/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		24.0	24.0		6.0	24.0	
Minimum Split (s)	30.0	30.0		30.0	30.0		32.0	32.0		10.0	32.0	
Total Split (s)	30.0	30.0		30.0	30.0		35.0	35.0		10.0	45.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		46.7%	46.7%		13.3%	60.0%	
Maximum Green (s)	24.6	24.6		24.6	24.6		29.6	29.6		7.0	39.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.0	3.3	
All-Red Time (s)	2.1	2.1		2.1	2.1		2.1	2.1		0.0	2.1	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.4			5.4			5.4			5.4	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
Recall Mode	None	None		None	None		C-Min	C-Min		None	C-Min	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	20	20		20	20		35	35		35	35	
Act Effect Green (s)		15.2			15.2			53.2			53.2	
Actuated g/C Ratio		0.20			0.20			0.71			0.71	
v/c Ratio		0.29			0.29			0.34			0.59	
Control Delay		21.5			9.9			7.8			11.6	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		21.5			9.9			7.8			11.6	
LOS		C			A			A			B	
Approach Delay		21.5			9.9			7.8			11.6	
Approach LOS		C			A			A			B	

Intersection Summary

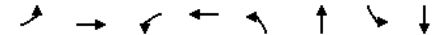
Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.59
 Intersection Signal Delay: 10.8 Intersection LOS: B
 Intersection Capacity Utilization 83.1% ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 8: Kerr Street & Stewart Street



Timings
8: Kerr Street & Stewart Street

02/29/2024

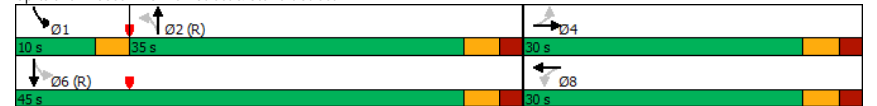


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↕		↕	↕	↕	↕		↕
Traffic Volume (vph)	50	10		10	15	10	375	55	555
Future Volume (vph)	50	10		10	15	10	375	55	555
Turn Type	Perm	NA		Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8	8		2	1	6
Permitted Phases	4			8		2		6	
Detector Phase	4	4		8	8	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0		10.0	10.0	24.0	24.0	6.0	24.0
Minimum Split (s)	30.0	30.0		30.0	30.0	32.0	32.0	10.0	32.0
Total Split (s)	30.0	30.0		30.0	30.0	35.0	35.0	10.0	45.0
Total Split (%)	40.0%	40.0%		40.0%	40.0%	46.7%	46.7%	13.3%	60.0%
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	3.3	3.0	3.3
All-Red Time (s)	2.1	2.1		2.1	2.1	2.1	2.1	0.0	2.1
Lost Time Adjust (s)		0.0			0.0		0.0		0.0
Total Lost Time (s)		5.4			5.4		5.4		5.4
Lead/Lag						Lag	Lag	Lead	
Lead-Lag Optimize?						Yes	Yes	Yes	
Recall Mode	None	None		None	None	C-Min	C-Min	None	C-Min
Act Effect Green (s)		15.2			15.2		53.2		53.2
Actuated g/C Ratio		0.20			0.20		0.71		0.71
v/c Ratio		0.29			0.29		0.34		0.59
Control Delay		21.5			9.9		7.8		11.6
Queue Delay		0.0			0.0		0.0		0.0
Total Delay		21.5			9.9		7.8		11.6
LOS		C			A		A		B
Approach Delay		21.5			9.9		7.8		11.6
Approach LOS		C			A		A		B

Intersection Summary

Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.59
 Intersection Signal Delay: 10.8 Intersection LOS: B
 Intersection Capacity Utilization 83.1% ICU Level of Service E
 Analysis Period (min) 15

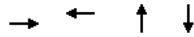
Splits and Phases: 8: Kerr Street & Stewart Street



Queues

8: Kerr Street & Stewart Street

02/29/2024



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	81	109	435	717
w/c Ratio	0.29	0.29	0.34	0.59
Control Delay	21.5	9.9	7.8	11.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.5	9.9	7.8	11.6
Queue Length 50th (m)	8.5	3.4	17.8	38.0
Queue Length 95th (m)	16.4	13.0	52.9	115.3
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)				
Base Capacity (vph)	447	556	1293	1218
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced w/c Ratio	0.18	0.20	0.34	0.59
Intersection Summary				

HCM Signalized Intersection Capacity Analysis

8: Kerr Street & Stewart Street

02/29/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	50	10	15	10	15	75	10	375	15	55	555	50
Future Volume (vph)	50	10	15	10	15	75	10	375	15	55	555	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.4			5.4			5.4			5.4	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.99			0.96			1.00			0.99	
Flpb, ped/bikes		0.98			1.00			1.00			1.00	
Frt		0.97			0.90			1.00			0.99	
Flt Protected		0.97			0.99			1.00			1.00	
Satd. Flow (prot)		1675			1575			1854			1827	
Flt Permitted		0.77			0.97			0.98			0.94	
Satd. Flow (perm)		1334			1530			1824			1716	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	11	16	11	16	82	11	408	16	60	603	54
RTOR Reduction (vph)	0	13	0	0	68	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	68	0	0	41	0	0	434	0	0	714	0
Confl. Peds. (#/hr)	20		15	15		20	35		25	25		35
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.2			13.2			51.0			51.0	
Effective Green, g (s)		13.2			13.2			51.0			51.0	
Actuated g/C Ratio		0.18			0.18			0.68			0.68	
Clearance Time (s)		5.4			5.4			5.4			5.4	
Vehicle Extension (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		234			269			1240			1166	
v/s Ratio Prot												
v/s Ratio Perm		c0.05			0.03			0.24			c0.42	
v/c Ratio		0.29			0.15			0.35			0.61	
Uniform Delay, d1		26.8			26.2			5.0			6.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.9			0.4			0.8			1.0	
Delay (s)		27.8			26.5			5.8			7.5	
Level of Service		C			C			A			A	
Approach Delay (s)		27.8			26.5			5.8			7.5	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		9.7			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.57										
Actuated Cycle Length (s)		75.0			Sum of lost time (s)			13.8				
Intersection Capacity Utilization		83.1%			ICU Level of Service			E				
Analysis Period (min)		15										

c Critical Lane Group

Lanes, Volumes, Timings

9: Speers Internal Road 1 & Speers Road

02/29/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕		↕
Traffic Volume (vph)	1055	60	0	1625	0	20
Future Volume (vph)	1055	60	0	1625	0	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.992					0.865
Flt Protected						
Satd. Flow (prot)	3581	0	0	3610	0	1644
Flt Permitted						
Satd. Flow (perm)	3581	0	0	3610	0	1644
Link Speed (k/h)	60			60	20	
Link Distance (m)	147.2			113.4	44.5	
Travel Time (s)	8.8			6.8	8.0	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1077	61	0	1658	0	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1138	0	0	1658	0	20
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	48.3%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

9: Speers Internal Road 1 & Speers Road

02/29/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕		↕
Traffic Volume (veh/h)	1055	60	0	1625	0	20
Future Volume (Veh/h)	1055	60	0	1625	0	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	1077	61	0	1658	0	20
Pedestrians	1			1		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	147			347		
pX, platoon unblocked			0.85		0.86	0.85
vC, conflicting volume			1138		1938	570
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			822		1001	157
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	97
cM capacity (veh/h)			698		208	740

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	718	420	829	829	20
Volume Left	0	0	0	0	0
Volume Right	0	61	0	0	20
cSH	1700	1700	1700	1700	740
Volume to Capacity	0.42	0.25	0.49	0.49	0.03
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.6
Control Delay (s)	0.0	0.0	0.0	0.0	10.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		10.0
Approach LOS					A


Intersection Summary

Average Delay	0.1
Intersection Capacity Utilization	48.3%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/29/2024


						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	20	0	0	55	5
Future Volume (vph)	0	20	0	0	55	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected						0.956
Satd. Flow (prot)	1644	0	1900	0	0	1816
Flt Permitted						0.956
Satd. Flow (perm)	1644	0	1900	0	0	1816
Link Speed (k/h)	20		20		20	
Link Distance (m)	67.5		49.5		44.5	
Travel Time (s)	12.2		8.9		8.0	
Confl. Peds. (#/hr)	8					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	25	0	0	70	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	25	0	0	0	0	76
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	14		24	
Sign Control	Stop		Free		Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	15.7%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/29/2024

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	20	0	0	55	5
Future Volume (Veh/h)	0	20	0	0	55	5
Sign Control	Stop		Free		Free	
Grade	0%					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	25	0	0	70	6
Pedestrians	2					
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0					1
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	148	8	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	148	8	0			
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			96	
cM capacity (veh/h)	811	1072			1636	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	25	0	76
Volume Left	0	0	70
Volume Right	25	0	0
cSH	1072	1700	1636
Volume to Capacity	0.02	0.00	0.04
Queue Length 95th (m)	0.5	0.0	1.0
Control Delay (s)	8.4	0.0	6.7
Lane LOS	A		A
Approach Delay (s)	8.4	0.0	6.7
Approach LOS	A		

Intersection Summary			
Average Delay	7.2		
Intersection Capacity Utilization	15.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
12: Underground & Speers Internal Road

02/29/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (vph)	25	25	20	10	15	10
Future Volume (vph)	25	25	20	10	15	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.932			0.945		
Flt Protected			0.968	0.971		
Satd. Flow (prot)	1771	0	0	1839	1743	0
Flt Permitted			0.968	0.971		
Satd. Flow (perm)	1771	0	0	1839	1743	0
Link Speed (k/h)	20		20	20		
Link Distance (m)	67.5		44.6	38.9		
Travel Time (s)	12.2		8.0	7.0		
Confl. Peds. (#/hr)				10		
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	32	32	25	13	19	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	64	0	0	38	32	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0		0.0	3.6		
Link Offset(m)	0.0		0.0	0.0		
Crosswalk Width(m)	1.6		1.6	1.6		
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	18.3%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
12: Underground & Speers Internal Road

02/29/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (veh/h)	25	25	20	10	15	10
Future Volume (Veh/h)	25	25	20	10	15	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	32	32	25	13	19	13
Pedestrians	10			3		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	1			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			64		121	51
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			64		121	51
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		98	99
cM capacity (veh/h)			1551		857	1020

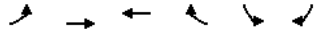
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	64	38	32
Volume Left	0	25	19
Volume Right	32	0	13
cSH	1700	1551	917
Volume to Capacity	0.04	0.02	0.03
Queue Length 95th (m)	0.0	0.4	0.8
Control Delay (s)	0.0	4.9	9.1
Lane LOS		A	A
Approach Delay (s)	0.0	4.9	9.1
Approach LOS			A

Intersection Summary			
Average Delay		3.6	
Intersection Capacity Utilization	18.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings

13: Speers Internal Road/30 Speers & Speers Internal Road 2

02/29/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑		↑	↑	
Traffic Volume (vph)	15	20	0	10	0	30
Future Volume (vph)	15	20	0	10	0	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.865	0.865		
Flt Protected		0.979				
Satd. Flow (prot)	0	1713	0	1644	1467	0
Flt Permitted		0.979				
Satd. Flow (perm)	0	1713	0	1644	1467	0
Link Speed (k/h)		20	20		20	
Link Distance (m)		44.6	43.4		49.2	
Travel Time (s)		8.0	7.8		8.9	
Confl. Peds. (#/hr)	2			2	7	
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63
Heavy Vehicles (%)	20%	0%	0%	0%	0%	12%
Adj. Flow (vph)	24	32	0	16	0	48
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	56	0	16	48	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		24		14	24	14
Sign Control		Stop	Stop		Free	

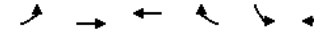
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.5%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

13: Speers Internal Road/30 Speers & Speers Internal Road 2

02/29/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑		↑	↑	
Traffic Volume (veh/h)	15	20	0	10	0	30
Future Volume (Veh/h)	15	20	0	10	0	30
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63
Hourly flow rate (vph)	24	32	0	16	0	48
Pedestrians		3	7		2	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.1	1.1		1.1	
Percent Blockage		0	1		0	
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	45	34	58	9	7	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	45	34	58	9	7	
tC, single (s)	7.3	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.7	4.0	4.0	3.3	2.2	
p0 queue free %	97	96	100	99	100	
cM capacity (veh/h)	890	855	829	1070	1616	

Direction, Lane #

	EB 1	WB 1	SB 1
Volume Total	56	16	48
Volume Left	24	0	0
Volume Right	0	16	48
cSH	869	1070	1616
Volume to Capacity	0.06	0.01	0.00
Queue Length 95th (m)	1.6	0.3	0.0
Control Delay (s)	9.4	8.4	0.0
Lane LOS	A	A	
Approach Delay (s)	9.4	8.4	0.0
Approach LOS	A	A	

Intersection Summary

Average Delay		5.5	
Intersection Capacity Utilization	18.5%	ICU Level of Service	A
Analysis Period (min)		15	

Lanes, Volumes, Timings

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/29/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (vph)	0	1075	5	25	1600	0	20	0	10	5	0	5
Future Volume (vph)	0	1075	5	25	1600	0	20	0	10	5	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999						0.954			0.932	
Flt Protected					0.999			0.968			0.976	
Satd. Flow (prot)	0	3536	0	0	3537	0	0	1755	0	0	1694	0
Flt Permitted					0.999			0.968			0.976	
Satd. Flow (perm)	0	3536	0	0	3537	0	0	1755	0	0	1694	0
Link Speed (k/h)		60			60			20			20	
Link Distance (m)		113.4			233.1			49.2			39.0	
Travel Time (s)		6.8			14.0			8.9			7.0	
Confl. Peds. (#/hr)			8	8								
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	2%	0%	2%	2%	2%
Adj. Flow (vph)	0	1132	5	26	1684	0	21	0	11	5	0	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1137	0	0	1710	0	0	32	0	0	10	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	71.9%
ICU Level of Service	C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/29/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (veh/h)	0	1075	5	25	1600	0	20	0	10	5	0	5
Future Volume (Veh/h)	0	1075	5	25	1600	0	20	0	10	5	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Hourly flow rate (vph)	0	1132	5	26	1684	0	21	0	11	5	0	5
Pedestrians		4			4			8			8	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		0			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		261			233							
pX, platoon unblocked	0.78			0.88			0.84	0.84	0.88	0.84	0.84	0.78
vC, conflicting volume	1684			1145			2046	2878	580	2317	2881	846
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1315			889			1217	2206	246	1539	2209	242
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			81	100	98	92	100	99
cM capacity (veh/h)	407			672			111	35	661	63	35	590

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	755	382	587	1123	32	10
Volume Left	0	0	26	0	21	5
Volume Right	0	5	0	0	11	5
cSH	1700	1700	672	1700	155	113
Volume to Capacity	0.44	0.22	0.04	0.66	0.21	0.09
Queue Length 95th (m)	0.0	0.0	0.0	0.9	5.6	2.2
Control Delay (s)	0.0	0.0	1.1	0.0	34.1	39.8
Lane LOS			A		D	E
Approach Delay (s)	0.0		0.4		34.1	39.8
Approach LOS			D		E	

Intersection Summary

Average Delay	0.7
Intersection Capacity Utilization	71.9%
ICU Level of Service	C
Analysis Period (min)	15

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

02/29/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	80	690	95	185	535	180	105	125	370	370	190	70
Future Volume (vph)	80	690	95	185	535	180	105	125	370	370	190	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	105.0		0.0	75.0		100.0	50.0		45.0	0.0		0.0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	1.00				0.94	0.96		0.93	0.95		0.98
Frt		0.982				0.850			0.850		0.959	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3469	0	1752	3539	1583	1787	1900	1599	1787	1787	0
Flt Permitted	0.423			0.207			0.591			0.546		
Satd. Flow (perm)	788	3469	0	382	3539	1485	1066	1900	1486	980	1787	0
Right Turn on Red			Yes			Yes		Yes			Yes	
Satd. Flow (RTOR)		13				189			241		18	
Link Speed (kh)		60			60			50			50	
Link Distance (m)		235.8			147.2			127.4			167.2	
Travel Time (s)		14.1			8.8			9.2			12.0	
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Adj. Flow (vph)	84	726	100	195	563	189	111	132	389	389	274	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	84	826	0	195	563	189	111	132	389	389	274	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	0.6	2.0	0.6	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

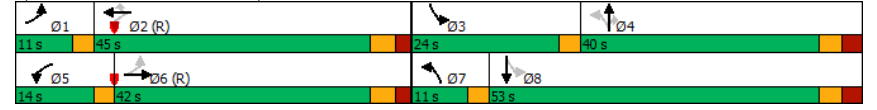
02/29/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2		2	4		4	8		
Detector Phase	1	6		5	2	2	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	7.0	25.0		7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0	
Minimum Split (s)	10.0	30.9		10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3	
Total Split (s)	11.0	42.0		14.0	45.0	45.0	11.0	40.0	40.0	24.0	53.0	
Total Split (%)	9.2%	35.0%		11.7%	37.5%	37.5%	9.2%	33.3%	33.3%	20.0%	44.2%	
Maximum Green (s)	8.0	36.1		11.0	39.1	39.1	8.0	33.7	33.7	21.0	46.7	
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	
All-Red Time (s)	0.0	2.2		0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	5.5		2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	
Walk Time (s)		7.0			7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		14.0			14.0	14.0		14.0	14.0		14.0	
Pedestrian Calls (#/hr)		15			15	15		35	35		35	
Act Effect Green (s)	58.7	48.1		65.6	54.0	54.0	32.5	21.1	21.1	48.4	34.1	
Actuated g/C Ratio	0.49	0.40		0.55	0.45	0.45	0.27	0.18	0.18	0.40	0.28	
v/c Ratio	0.19	0.59		0.57	0.35	0.24	0.33	0.40	0.85	0.72	0.53	
Control Delay	16.9	32.1		23.7	25.0	4.8	24.6	44.9	34.1	34.5	36.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0	
Total Delay	16.9	32.1		23.7	25.0	4.8	24.6	44.9	34.1	37.4	36.0	
LOS	B	C		C	C	A	C	D	C	D	D	
Approach Delay		30.7			20.7			34.7			36.8	
Approach LOS		C			C			C			D	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 43 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 29.8
 Intersection Capacity Utilization 84.4%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 1: Kerr Street & Speers Road



Timings
1: Kerr Street & Speers Road

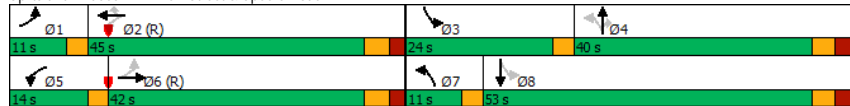
02/29/2024

	↖	→	↙	←	↘	↖	↙	↘	↖	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↘	↖	↘	↖	↖	↘	↖	↘	↘	↖
Traffic Volume (vph)	80	690	185	535	180	105	125	370	370	190
Future Volume (vph)	80	690	185	535	180	105	125	370	370	190
Turn Type	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	1	6	5	2		7	4		3	8
Permitted Phases	6	2	2	2	4	4	4	8		
Detector Phase	1	6	5	2	2	7	4	4	3	8
Switch Phase										
Minimum Initial (s)	7.0	25.0	7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0
Minimum Split (s)	10.0	30.9	10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3
Total Split (s)	11.0	42.0	14.0	45.0	45.0	11.0	40.0	40.0	24.0	53.0
Total Split (%)	9.2%	35.0%	11.7%	37.5%	37.5%	9.2%	33.3%	33.3%	20.0%	44.2%
Yellow Time (s)	3.0	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3
All-Red Time (s)	0.0	2.2	0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	None	C-Min	C-Min	None	None	None	None	None
Act Effect Green (s)	58.7	48.1	65.6	54.0	54.0	32.5	21.1	21.1	48.4	34.1
Actuated g/C Ratio	0.49	0.40	0.55	0.45	0.45	0.27	0.18	0.18	0.40	0.28
v/c Ratio	0.19	0.59	0.57	0.35	0.24	0.33	0.40	0.85	0.72	0.53
Control Delay	16.9	32.1	23.7	25.0	4.8	24.6	44.9	34.1	34.5	36.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0
Total Delay	16.9	32.1	23.7	25.0	4.8	24.6	44.9	34.1	37.4	36.0
LOS	B	C	C	C	A	C	D	C	D	D
Approach Delay		30.7		20.7			34.7			36.8
Approach LOS		C		C			C			D

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 43 (36%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 29.8 Intersection LOS: C
 Intersection Capacity Utilization 84.4% ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 1: Kerr Street & Speers Road



Queues
1: Kerr Street & Speers Road

02/29/2024

	↖	→	↙	←	↘	↖	↙	↘	↖	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	84	826	195	563	189	111	132	389	389	274
v/c Ratio	0.19	0.59	0.57	0.35	0.24	0.33	0.40	0.85	0.72	0.53
Control Delay	16.9	32.1	23.7	25.0	4.8	24.6	44.9	34.1	34.5	36.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0
Total Delay	16.9	32.1	23.7	25.0	4.8	24.6	44.9	34.1	37.4	36.0
Queue Length 50th (m)	9.1	80.3	22.8	46.5	0.0	16.2	27.9	35.2	68.2	50.8
Queue Length 95th (m)	21.1	116.1	44.6	72.5	15.7	23.1	40.5	64.8	80.0	65.3
Internal Link Dist (m)		211.8		123.2			103.4			143.2
Turn Bay Length (m)	105.0		75.0		100.0	50.0		45.0		
Base Capacity (vph)	457	1398	347	1591	772	339	533	590	539	706
Starvation Cap Reductn	0	0	0	0	0	0	0	0	73	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.59	0.56	0.35	0.24	0.33	0.25	0.66	0.83	0.39

Intersection Summary

HCM Signalized Intersection Capacity Analysis

1: Kerr Street & Speers Road

02/29/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	80	690	95	185	535	180	105	125	370	370	190	70
Future Volume (vph)	80	690	95	185	535	180	105	125	370	370	190	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frb, ped/bikes	1.00	1.00		1.00	1.00	0.94	1.00	1.00	0.93	1.00	0.98	
Flpb, ped/bikes	0.99	1.00		1.00	1.00	1.00	0.98	1.00	1.00	0.98	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	3469		1752	3539	1485	1745	1900	1486	1746	1788	
Flt Permitted	0.42	1.00		0.21	1.00	1.00	0.59	1.00	1.00	0.55	1.00	
Satd. Flow (perm)	796	3469		381	3539	1485	1086	1900	1486	1004	1788	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	84	726	100	195	563	189	111	132	389	389	200	74
RTOR Reduction (vph)	0	8	0	0	0	105	0	0	199	0	13	0
Lane Group Flow (vph)	84	818	0	195	563	84	111	132	190	389	261	0
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2		2	4		4	8		
Actuated Green, G (s)	54.3	48.0		62.6	53.3	53.3	29.2	21.1	21.1	45.2	34.1	
Effective Green, g (s)	54.3	48.0		62.6	53.3	53.3	29.2	21.1	21.1	45.2	34.1	
Actuated g/C Ratio	0.45	0.40		0.52	0.44	0.44	0.24	0.18	0.18	0.38	0.28	
Clearance Time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Vehicle Extension (s)	2.5	5.5		2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	
Lane Grp Cap (vph)	412	1387		331	1571	659	308	334	261	508	508	
v/s Ratio Prot	0.01	0.24		c0.06	0.16		0.02	0.07		c0.13	0.15	
v/s Ratio Perm	0.08			c0.25		0.06	0.06		0.13	c0.15		
v/c Ratio	0.20	0.59		0.59	0.36	0.13	0.36	0.40	0.73	0.77	0.51	
Uniform Delay, d1	18.9	28.3		17.9	22.0	19.6	36.7	43.8	46.8	30.2	36.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	1.8		2.2	0.6	0.4	0.5	1.1	10.4	6.5	1.2	
Delay (s)	19.1	30.1		20.1	22.7	20.0	37.2	44.9	57.2	36.7	37.2	
Level of Service	B	C		C	C	C	D	D	E	D	D	
Approach Delay (s)		29.1			21.6			51.1			36.9	
Approach LOS		C			C			D			D	

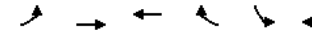
Intersection Summary		
HCM 2000 Control Delay	32.9	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.70	
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	84.4%	ICU Level of Service
Analysis Period (min)	15	

c Critical Lane Group

Lanes, Volumes, Timings

2: Speers Road & Cross Avenue

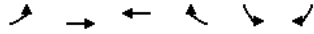
02/29/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	220	1260	640	20	5	245
Future Volume (vph)	220	1260	640	20	5	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	80.0			0.0	45.0	0.0
Storage Lanes	1			0	1	2
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	0.88
Ped Bike Factor	1.00		1.00			
Frt			0.995			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1703	3610	3554	0	1805	2733
Flt Permitted	0.358				0.950	
Satd. Flow (perm)	640	3610	3554	0	1805	2733
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			3			255
Link Speed (k/h)		60	60		48	
Link Distance (m)		233.1	101.5		84.0	
Travel Time (s)		14.0	6.1		6.3	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Adj. Flow (vph)	229	1313	667	21	5	255
Shared Lane Traffic (%)						
Lane Group Flow (vph)	229	1313	688	0	5	255
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
2: Speers Road & Cross Avenue

02/29/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Detector Phase	5	2	6		4	4
Switch Phase						
Minimum Initial (s)	6.0	38.0	38.0		10.0	10.0
Minimum Split (s)	12.0	47.6	47.6		15.8	15.8
Total Split (s)	35.0	109.0	74.0		31.0	31.0
Total Split (%)	25.0%	77.9%	52.9%		22.1%	22.1%
Maximum Green (s)	29.0	102.4	67.4		25.2	25.2
Yellow Time (s)	4.0	3.7	3.7		3.3	3.3
All-Red Time (s)	2.0	2.9	2.9		2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6		5.8	5.8
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Recall Mode	None	C-Min	C-Min		None	None
Walk Time (s)		10.0	10.0			
Flash Dont Walk (s)		31.0	31.0			
Pedestrian Calls (#/hr)		5	5			
Act Effect Green (s)	118.0	117.4	101.9		10.2	10.2
Actuated g/C Ratio	0.84	0.84	0.73		0.07	0.07
v/c Ratio	0.38	0.43	0.27		0.04	0.58
Control Delay	3.8	3.4	6.8		60.8	12.8
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	3.8	3.4	6.8		60.8	12.8
LOS	A	A	A		E	B
Approach Delay		3.5	6.8		13.7	
Approach LOS		A	A		B	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 99 (71%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 5.4 Intersection LOS: A
 Intersection Capacity Utilization 70.0% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: Speers Road & Cross Avenue



Timings
2: Speers Road & Cross Avenue

02/29/2024

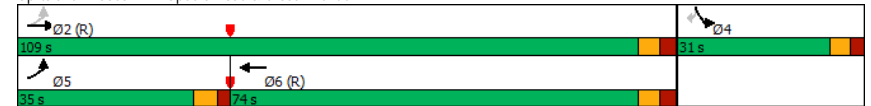


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↕↕	↕↕	↔	↕↕
Traffic Volume (vph)	220	1260	640	5	245
Future Volume (vph)	220	1260	640	5	245
Turn Type	pm+pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2				4
Detector Phase	5	2	6	4	4
Switch Phase					
Minimum Initial (s)	6.0	38.0	38.0	10.0	10.0
Minimum Split (s)	12.0	47.6	47.6	15.8	15.8
Total Split (s)	35.0	109.0	74.0	31.0	31.0
Total Split (%)	25.0%	77.9%	52.9%	22.1%	22.1%
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	None	None
Act Effect Green (s)	118.0	117.4	101.9	10.2	10.2
Actuated g/C Ratio	0.84	0.84	0.73	0.07	0.07
v/c Ratio	0.38	0.43	0.27	0.04	0.58
Control Delay	3.8	3.4	6.8	60.8	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.8	3.4	6.8	60.8	12.8
LOS	A	A	A	E	B
Approach Delay		3.5	6.8	13.7	
Approach LOS		A	A	B	

Intersection Summary

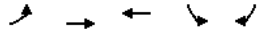
Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 99 (71%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 5.4 Intersection LOS: A
 Intersection Capacity Utilization 70.0% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 2: Speers Road & Cross Avenue



Queues
2: Speers Road & Cross Avenue

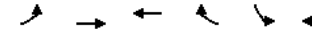
02/29/2024



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	229	1313	688	5	255
w/c Ratio	0.38	0.43	0.27	0.04	0.58
Control Delay	3.8	3.4	6.8	60.8	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	3.8	3.4	6.8	60.8	12.8
Queue Length 50th (m)	8.8	37.7	29.9	1.3	0.0
Queue Length 95th (m)	14.2	47.7	41.0	5.8	14.3
Internal Link Dist (m)		209.1	77.5	60.0	
Turn Bay Length (m)	80.0		45.0		
Base Capacity (vph)	759	3026	2588	324	701
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.30	0.43	0.27	0.02	0.36
Intersection Summary					

HCM Signalized Intersection Capacity Analysis
2: Speers Road & Cross Avenue

02/29/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↕↕	↕↕		↔	↕↕
Traffic Volume (vph)	220	1260	640	20	5	245
Future Volume (vph)	220	1260	640	20	5	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.6	6.6		5.8	5.8
Lane Util. Factor	1.00	0.95	0.95		1.00	0.88
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1701	3610	3556		1805	2733
Flt Permitted	0.36	1.00	1.00		0.95	1.00
Satd. Flow (perm)	640	3610	3556		1805	2733
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	229	1312	667	21	5	255
RTOR Reduction (vph)	0	0	1	0	0	236
Lane Group Flow (vph)	229	1313	687	0	5	19
Confl. Peds. (#/hr)	5			5		
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	117.4	117.4	102.0		10.2	10.2
Effective Green, g (s)	117.4	117.4	102.0		10.2	10.2
Actuated g/C Ratio	0.84	0.84	0.73		0.07	0.07
Clearance Time (s)	6.0	6.6	6.6		5.8	5.8
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Lane Grp Cap (vph)	607	3027	2590		131	199
v/s Ratio Prot	0.03	c0.36	0.19		0.00	
v/s Ratio Perm	0.29					c0.01
v/c Ratio	0.38	0.43	0.27		0.04	0.09
Uniform Delay, d1	2.5	2.9	6.4		60.3	60.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.5	0.5	0.3		0.1	0.2
Delay (s)	3.0	3.3	6.6		60.5	60.8
Level of Service	A	A	A		E	E
Approach Delay (s)		3.3	6.6		60.8	
Approach LOS		A	A		E	
Intersection Summary						
HCM 2000 Control Delay		10.2			HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio		0.43				
Actuated Cycle Length (s)		140.0			Sum of lost time (s)	18.4
Intersection Capacity Utilization		70.0%			ICU Level of Service	C
Analysis Period (min)		15				
c Critical Lane Group						

Lanes, Volumes, Timings
3: St. Augustine Drive & Speers Road

02/29/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕			↕				↕		↕	
Traffic Volume (vph)	5	795	15	0	785	20	5	0	50	0	0	0
Future Volume (vph)	5	795	15	0	785	20	5	0	50	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0			0			1			0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.997			0.996				0.865			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1805	3562	0	0	3561	0	0	0	1644	0	1900	0
Flt Permitted	0.950							0.950				
Satd. Flow (perm)	1805	3562	0	0	3561	0	0	0	1644	0	1900	0
Link Speed (k/h)		60			60				40			30
Link Distance (m)		248.1			235.8				188.1			117.6
Travel Time (s)		14.9			14.1				16.9			14.1
Confl. Peds. (#/hr)	8		5	5		8	1		1	1		1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	5	828	16	0	818	21	5	0	52	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	844	0	0	839	0	0	5	52	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6				0.0			0.0
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		1.6			1.6				1.6			1.6
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free				Stop			Stop

Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization Err%	ICU Level of Service H											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
3: St. Augustine Drive & Speers Road

02/29/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕			↕				↕		↕	
Traffic Volume (veh/h)	5	795	15	0	785	20	5	0	50	0	0	0
Future Volume (Veh/h)	5	795	15	0	785	20	5	0	50	0	0	0
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	828	16	0	818	21	5	0	52	0	0	0
Pedestrians	1			1			5			8		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	0			0			0			1		
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)	236											
pX, platoon unblocked	0.90						0.90			0.90		
vC, conflicting volume	847			849			1261			1698		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	609			849			1069			1554		
tC, single (s)	4.1			4.1			7.5			6.5		
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5			4.0		
p0 queue free %	99			100			97			100		
cM capacity (veh/h)	876			794			158			101		

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	5	552	292	545	294	57	0
Volume Left	5	0	0	0	0	5	0
Volume Right	0	0	16	0	21	52	0
cSH	876	1700	1700	1700	1700	468	1700
Volume to Capacity	0.01	0.32	0.17	0.32	0.17	0.12	0.00
Queue Length 95th (m)	0.1	0.0	0.0	0.0	0.0	3.1	0.0
Control Delay (s)	9.1	0.0	0.0	0.0	0.0	13.8	0.0
Lane LOS	A				B		A
Approach Delay (s)	0.1			0.0			13.8
Approach LOS				B			A

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	Err%	ICU Level of Service H	
Analysis Period (min)	15		

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

02/29/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Volume (vph)	55	10	35	75	5	165	55	275	60	95	530	20
Future Volume (vph)	55	10	35	75	5	165	55	275	60	95	530	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Ped Bike Factor												
Frt	0.953				0.909				0.977		0.995	
Flt Protected	0.973				0.985				0.993		0.993	
Satd. Flow (prot)	0	1727	0	0	1651	0	0	3443	0	0	3535	0
Flt Permitted	0.754				0.857				0.808		0.831	
Satd. Flow (perm)	0	1338	0	0	1430	0	0	2801	0	0	2957	0
Right Turn on Red			Yes				Yes				Yes	
Satd. Flow (RTOR)	32				126				29		6	
Link Speed (k/h)	40				50				50		50	
Link Distance (m)	89.6				265.3				167.2		26.5	
Travel Time (s)	8.1				19.1				12.0		1.9	
Confl. Peds. (#/hr)			13				6		4		4	
Peak Hour Factor	0.92	0.92	0.92	0.97	0.92	0.97	0.92	0.97	0.97	0.97	0.97	0.92
Heavy Vehicles (%)	2%	2%	2%	3%	2%	1%	2%	1%	2%	0%	1%	2%
Adj. Flow (vph)	60	11	38	77	5	170	60	284	62	98	546	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	109	0	0	252	0	0	406	0	0	666	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0				0.0				0.0		0.0	
Link Offset(m)	0.0				0.0				0.0		0.0	
Crosswalk Width(m)	1.6				1.6				1.6		1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	97		97	24		14	97		14	24		97
Number of Detectors	1	2			1	2		1	2		1	2
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases	4				8				2		6	
Permitted Phases	4				8				2		6	

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

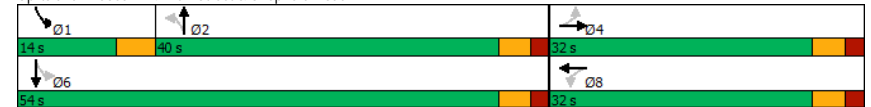
02/29/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4		4		8		8		2		2	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		18.0	18.0		7.0	18.0	
Minimum Split (s)	23.4	23.4		23.4	23.4		28.2	28.2		11.0	28.2	
Total Split (s)	32.0	32.0		32.0	32.0		40.0	40.0		14.0	54.0	
Total Split (%)	37.2%	37.2%		37.2%	37.2%		46.5%	46.5%		16.3%	62.8%	
Maximum Green (s)	26.6	26.6		26.6	26.6		34.8	34.8		10.0	48.8	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		4.0	3.3	
All-Red Time (s)	2.1	2.1		2.1	2.1		1.9	1.9		0.0	1.9	
Lost Time Adjust (s)												
Total Lost Time (s)	5.4				5.4				5.2		5.2	
Lead/Lag							Lag		Lag		Lead	
Lead-Lag Optimize?							Yes		Yes		Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.5	3.5		2.5	3.5	
Recall Mode	None	None		None	None		Min	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		10.0	10.0			10.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		13.0	13.0			13.0	
Pedestrian Calls (#/hr)	0		0		0		5		5		5	
Act Effect Green (s)	11.0				11.0		19.0		19.0		19.0	
Actuated g/C Ratio	0.27				0.27		0.47		0.47		0.47	
v/c Ratio	0.28				0.53		0.31		0.48		0.48	
Control Delay	11.4				11.4		7.2		9.0		9.0	
Queue Delay	0.0				0.0		0.0		0.0		0.0	
Total Delay	11.4				11.4		7.2		9.0		9.0	
LOS	B				B		A		A		A	
Approach Delay	11.4				11.4		7.2		9.0		9.0	
Approach LOS	B				B		A		A		A	

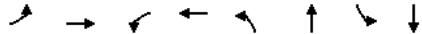
Intersection Summary	
Area Type:	Other
Cycle Length:	86
Actuated Cycle Length:	40.7
Natural Cycle:	65
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.53
Intersection Signal Delay:	9.1
Intersection Capacity Utilization:	62.7%
Analysis Period (min):	15
Intersection LOS:	A
ICU Level of Service:	B

Splits and Phases: 4: Kerr Street & Shepherd Road



Timings
4: Kerr Street & Shepherd Road

02/29/2024

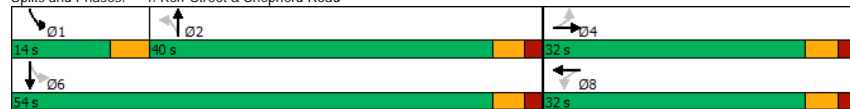


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔		↔		↕		↕
Traffic Volume (vph)	55	10	75	5	55	275	95	530
Future Volume (vph)	55	10	75	5	55	275	95	530
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	18.0	18.0	7.0	18.0
Minimum Split (s)	23.4	23.4	23.4	23.4	28.2	28.2	11.0	28.2
Total Split (s)	32.0	32.0	32.0	32.0	40.0	40.0	14.0	54.0
Total Split (%)	37.2%	37.2%	37.2%	37.2%	46.5%	46.5%	16.3%	62.8%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	4.0	3.3
All-Red Time (s)	2.1	2.1	2.1	2.1	1.9	1.9	0.0	1.9
Lost Time Adjust (s)		0.0		0.0		0.0		0.0
Total Lost Time (s)		5.4		5.4		5.2		5.2
Lead/Lag					Lag	Lag	Lead	Lead
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)	11.0		11.0		19.0		19.0	
Actuated g/C Ratio	0.27		0.27		0.47		0.47	
v/c Ratio	0.28		0.53		0.31		0.48	
Control Delay	11.4		11.4		7.2		9.0	
Queue Delay	0.0		0.0		0.0		0.0	
Total Delay	11.4		11.4		7.2		9.0	
LOS	B		B		A		A	
Approach Delay	11.4		11.4		7.2		9.0	
Approach LOS	B		B		A		A	

Intersection Summary

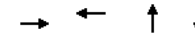
Cycle Length: 86
 Actuated Cycle Length: 40.7
 Natural Cycle: 65
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.53
 Intersection Signal Delay: 9.1
 Intersection Capacity Utilization 62.7%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 4: Kerr Street & Shepherd Road



Queues
4: Kerr Street & Shepherd Road

02/29/2024



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	109	252	406	666
v/c Ratio	0.28	0.53	0.31	0.48
Control Delay	11.4	11.4	7.2	9.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.4	11.4	7.2	9.0
Queue Length 50th (m)	3.9	6.6	7.0	13.8
Queue Length 95th (m)	13.6	23.0	16.1	28.9
Internal Link Dist (m)	65.6	241.3	143.2	2.5
Turn Bay Length (m)				
Base Capacity (vph)	891	984	2417	2957
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.12	0.26	0.17	0.23

Intersection Summary

HCM Signalized Intersection Capacity Analysis

4: Kerr Street & Shepherd Road

02/29/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	55	10	35	75	5	165	55	275	60	95	530	20
Future Volume (vph)	55	10	35	75	5	165	55	275	60	95	530	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4			5.4			5.2			5.2		
Lane Util. Factor	1.00			1.00			0.95			0.95		
Frb, ped/bikes	1.00			0.99			1.00			1.00		
Flpb, ped/bikes	1.00			1.00			1.00			1.00		
Frt	0.95			0.91			0.98			1.00		
Flt Protected	0.97			0.98			0.99			0.99		
Satd. Flow (prot)	1728			1652			3444			3534		
Flt Permitted	0.75			0.86			0.81			0.83		
Satd. Flow (perm)	1339			1438			2805			2956		
Peak-hour factor, PHF	0.92	0.92	0.92	0.97	0.92	0.92	0.97	0.97	0.97	0.97	0.97	0.92
Adj. Flow (vph)	60	11	38	77	5	170	60	284	62	98	546	22
RTOR Reduction (vph)	0	23	0	0	92	0	0	15	0	0	3	0
Lane Group Flow (vph)	0	86	0	0	160	0	0	391	0	0	663	0
Confl. Peds. (#/hr)				13			6			4		
Heavy Vehicles (%)	2%	2%	2%	3%	2%	1%	2%	1%	2%	0%	1%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases	4			8			2			1		
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	11.0			11.0			19.0			19.0		
Effective Green, g (s)	11.0			11.0			19.0			19.0		
Actuated g/C Ratio	0.27			0.27			0.47			0.47		
Clearance Time (s)	5.4			5.4			5.2			5.2		
Vehicle Extension (s)	3.0			3.0			3.5			3.5		
Lane Grp Cap (vph)	362			389			1312			1383		
v/s Ratio Prot												
v/s Ratio Perm	0.06			c0.11			0.14			c0.22		
v/c Ratio	0.24			0.41			0.30			0.48		
Uniform Delay, d1	11.5			12.1			6.7			7.4		
Progression Factor	1.00			1.00			1.00			1.00		
Incremental Delay, d2	0.3			0.7			0.2			0.3		
Delay (s)	11.9			12.9			6.8			7.7		
Level of Service	B			B			A			A		
Approach Delay (s)	11.9			12.9			6.8			7.7		
Approach LOS	B			B			A			A		

Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	40.6	Sum of lost time (s)	14.6
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

5: Kerr Street & Wycroft Road

02/29/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↔	↔	
Traffic Volume (vph)	5	100	230	260	545	125
Future Volume (vph)	5	100	230	260	545	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	75.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.975		
Frt	0.871			0.975		
Flt Protected	0.998		0.950			
Satd. Flow (prot)	1591	0	1703	1900	1839	0
Flt Permitted	0.998		0.950			
Satd. Flow (perm)	1591	0	1703	1900	1839	0
Link Speed (k/h)	50		50		50	
Link Distance (m)	561.6		442.6		98.1	
Travel Time (s)	40.4		31.9		7.1	
Confl. Peds. (#/hr)			5		5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	4%	6%	0%	0%	4%
Adj. Flow (vph)	5	106	245	277	580	133

Shared Lane Traffic (%)						
Lane Group Flow (vph)	111	0	245	277	713	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6		3.6	3.6		
Link Offset(m)	0.0		0.0	0.0		
Crosswalk Width(m)	1.6		1.6	1.6		
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop		Free		Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	65.6%
ICU Level of Service	C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

5: Kerr Street & Wycroft Road

02/29/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	5	100	230	260	545	125
Future Volume (Veh/h)	5	100	230	260	545	125
Sign Control	Stop		Free			
Grade	0%		0%			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	5	106	245	277	580	133
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1418	652	718			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1418	652	718			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	95	77	72			
cM capacity (veh/h)	108	463	861			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	111	245	277	713		
Volume Left	5	245	0	0		
Volume Right	106	0	0	133		
cSH	403	861	1700	1700		
Volume to Capacity	0.28	0.28	0.16	0.42		
Queue Length 95th (m)	8.4	8.9	0.0	0.0		
Control Delay (s)	17.3	10.8	0.0	0.0		
Lane LOS	C	B				
Approach Delay (s)	17.3	5.1	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			3.4			
Intersection Capacity Utilization			65.6%		ICU Level of Service C	
Analysis Period (min)	15					

Lanes, Volumes, Timings

6: Kerr Street & Prince Charles Drive

02/29/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	
Traffic Volume (vph)	5	0	5	5	0	75	5	520	5	40	425	5	
Future Volume (vph)	5	0	5	5	0	75	5	520	5	40	425	5	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor													
Frt	0.932		0.873				0.999			0.999			
Flt Protected	0.976		0.997				0.996						
Satd. Flow (prot)	0	1728	0	0	1654	0	0	1876	0	0	1848	0	
Flt Permitted	0.976		0.997				0.996						
Satd. Flow (perm)	0	1728	0	0	1654	0	0	1876	0	0	1848	0	
Link Speed (k/h)	40		40				50			50			
Link Distance (m)	57.8		56.0				134.8			127.4			
Travel Time (s)	5.2		5.0				9.7			9.2			
Confl. Peds. (#/hr)	4	1		1		4	21	31		31		21	
Confl. Bikes (#/hr)									1	1			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Heavy Vehicles (%)	0%	50%	0%	0%	0%	0%	20%	1%	0%	5%	2%	4%	
Adj. Flow (vph)	5	0	5	5	0	79	5	547	5	42	447	5	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	10	0	0	84	0	0	557	0	0	494	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(m)	0.0		0.0				0.0						
Link Offset(m)	0.0		0.0				0.0						
Crosswalk Width(m)	1.6		1.6				1.6			1.6			
Two way Left Turn Lane													
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (k/h)	24	14		24		14		24		14		24	
Sign Control	Stop		Stop				Free			Free			
Intersection Summary													
Area Type:	Other												
Control Type:	Unsignalized												
Intersection Capacity Utilization 62.1%							ICU Level of Service B						
Analysis Period (min)	15												

HCM Unsignalized Intersection Capacity Analysis

6: Kerr Street & Prince Charles Drive

02/29/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	5	0	5	5	0	75	5	520	5	40	425	5
Future Volume (Veh/h)	5	0	5	5	0	75	5	520	5	40	425	5
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	0	5	5	0	79	5	547	5	42	447	5
Pedestrians	21			31			1			4		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	2			3			0			0		
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (m)							238			127		
pX, platoon unblocked	0.87	0.87	0.84	0.87	0.87	0.93	0.84				0.93	
vC, conflicting volume	1197	1148	472	1130	1148	584	473				583	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	973	916	272	896	916	516	274				514	
tC, single (s)	7.1	7.0	6.2	7.1	6.5	6.2	4.3				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.5	3.3	3.5	4.0	3.3	2.4				2.2	
p0 queue free %	97	100	99	98	100	84	99				96	
cM capacity (veh/h)	156	180	633	205	217	507	980				937	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	10	84	557	494								
Volume Left	5	5	5	42								
Volume Right	5	79	5	5								
cSH	250	466	980	937								
Volume to Capacity	0.04	0.18	0.01	0.04								
Queue Length 95th (m)	0.9	4.9	0.1	1.1								
Control Delay (s)	20.0	14.4	0.1	1.3								
Lane LOS	C	B	A	A								
Approach Delay (s)	20.0	14.4	0.1	1.3								
Approach LOS	C	B										
Intersection Summary												
Average Delay	1.8											
Intersection Capacity Utilization	62.1%			ICU Level of Service	B							
Analysis Period (min)	15											

Lanes, Volumes, Timings

7: Kerr Street & Elmwood Road

02/29/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	30	10	5	500	390	45
Future Volume (vph)	30	10	5	500	390	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.965				0.986	
Fit Protected	0.964					
Satd. Flow (prot)	1723	0	0	1860	1827	0
Fit Permitted	0.964					
Satd. Flow (perm)	1723	0	0	1860	1827	0
Link Speed (k/h)	40				50	
Link Distance (m)	171.2				103.0 134.8	
Travel Time (s)	15.4				7.4 9.7	
Confl. Peds. (#/hr)	1	2	34			34
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	10%	20%	2%	2%	7%
Adj. Flow (vph)	32	11	5	526	411	47
Shared Lane Traffic (%)						
Lane Group Flow (vph)	43	0	0	531	458	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6				0.0	
Link Offset(m)	0.0				0.0	
Crosswalk Width(m)	1.6				1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24	14		
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	40.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

7: Kerr Street & Elmwood Road

02/29/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔		
Traffic Volume (veh/h)	30	10	5	500	390	45
Future Volume (Veh/h)	30	10	5	500	390	45
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	32	11	5	526	411	47
Pedestrians	34		2		1	
Lane Width (m)	3.6		3.6		3.6	
Walking Speed (m/s)	1.1		1.1		1.1	
Percent Blockage	3		0		0	
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)			103		262	
pX, platoon unblocked	0.94	0.93	0.93			
vC, conflicting volume	1006	470	492			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	796	389	412			
tC, single (s)	6.4	6.3	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.4			
p0 queue free %	90	98	99			
cM capacity (veh/h)	324	576	948			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	43	531	458			
Volume Left	32	5	0			
Volume Right	11	0	47			
cSH	365	948	1700			
Volume to Capacity	0.12	0.01	0.27			
Queue Length 95th (m)	3.0	0.1	0.0			
Control Delay (s)	16.2	0.1	0.0			
Lane LOS	C	A				
Approach Delay (s)	16.2	0.1	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			40.9%		ICU Level of Service A	
Analysis Period (min)			15			

Lanes, Volumes, Timings

8: Kerr Street & Stewart Street

02/29/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Volume (vph)	35	25	5	20	35	70	5	400	20	40	330	30
Future Volume (vph)	35	25	5	20	35	70	5	400	20	40	330	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98		0.97		1.00		1.00		0.99			
Frt	0.990		0.925		0.994		0.990					
Flt Protected	0.974		0.992		0.999		0.995					
Satd. Flow (prot)	0	1679	0	0	1616	0	0	1849	0	0	1829	0
Flt Permitted	0.796		0.941		0.996		0.930					
Satd. Flow (perm)	0	1353	0	0	1527	0	0	1843	0	0	1707	0
Right Turn on Red			Yes		Yes		Yes					
Satd. Flow (RTOR)	5		76		4		8					
Link Speed (k/h)	40		40		50		50					
Link Distance (m)	95.6		60.6		165.0		103.0					
Travel Time (s)	8.6		5.5		11.9		7.4					
Confl. Peds. (#/hr)	20		15	15		20	35		25	25		35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Adj. Flow (vph)	38	27	5	22	38	76	5	435	22	43	359	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	70	0	0	136	0	0	462	0	0	435	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0		0.0		0.0		0.0					
Link Offset(m)	0.0		0.0		0.0		0.0					
Crosswalk Width(m)	1.6		1.6		1.6		1.6					
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2			1	6
Permitted Phases		4			8			2			6	

Lanes, Volumes, Timings
8: Kerr Street & Stewart Street

02/29/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		24.0	24.0		6.0	24.0	
Minimum Split (s)	30.0	30.0		30.0	30.0		32.0	32.0		10.0	32.0	
Total Split (s)	30.0	30.0		30.0	30.0		35.0	35.0		10.0	45.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		46.7%	46.7%		13.3%	60.0%	
Maximum Green (s)	24.6	24.6		24.6	24.6		29.6	29.6		7.0	39.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.0	3.3	
All-Red Time (s)	2.1	2.1		2.1	2.1		2.1	2.1		0.0	2.1	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.4			5.4			5.4			5.4	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
Recall Mode	None	None		None	None		C-Min	C-Min		None	C-Min	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0		
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		14.0	14.0		14.0		
Pedestrian Calls (#/hr)	20	20		20	20		35	35		35		
Act Effect Green (s)		15.2			15.2			53.2			53.2	
Actuated g/C Ratio		0.20			0.20			0.71			0.71	
v/c Ratio		0.25			0.37			0.35			0.36	
Control Delay		23.5			14.0			7.9			8.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		23.5			14.0			7.9			8.0	
LOS		C			B			A			A	
Approach Delay		23.5			14.0			7.9			8.0	
Approach LOS		C			B			A			A	

Intersection Summary

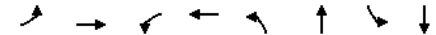
Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.37
 Intersection Signal Delay: 9.7 Intersection LOS: A
 Intersection Capacity Utilization 67.6% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 8: Kerr Street & Stewart Street



Timings
8: Kerr Street & Stewart Street

02/29/2024

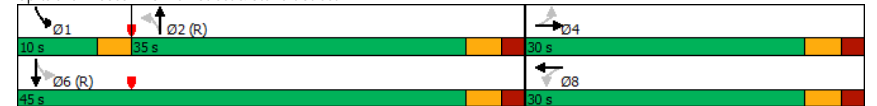


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔		↔		↔	↔		↔
Traffic Volume (vph)	35	25		20	35	5	400	40	330
Future Volume (vph)	35	25		20	35	5	400	40	330
Turn Type	Perm	NA		Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6	
Permitted Phases	4			8		2		6	
Detector Phase	4	4		8	8	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0		10.0	10.0	24.0	24.0	6.0	24.0
Minimum Split (s)	30.0	30.0		30.0	30.0	32.0	32.0	10.0	32.0
Total Split (s)	30.0	30.0		30.0	30.0	35.0	35.0	10.0	45.0
Total Split (%)	40.0%	40.0%		40.0%	40.0%	46.7%	46.7%	13.3%	60.0%
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	3.3	3.0	3.3
All-Red Time (s)	2.1	2.1		2.1	2.1	2.1	2.1	0.0	2.1
Lost Time Adjust (s)		0.0			0.0		0.0		0.0
Total Lost Time (s)		5.4			5.4		5.4		5.4
Lead/Lag						Lag	Lag	Lead	
Lead-Lag Optimize?						Yes	Yes	Yes	
Recall Mode	None	None		None	None	C-Min	C-Min	None	C-Min
Act Effect Green (s)		15.2			15.2		53.2		53.2
Actuated g/C Ratio		0.20			0.20		0.71		0.71
v/c Ratio		0.25			0.37		0.35		0.36
Control Delay		23.5			14.0		7.9		8.0
Queue Delay		0.0			0.0		0.0		0.0
Total Delay		23.5			14.0		7.9		8.0
LOS		C			B		A		A
Approach Delay		23.5			14.0		7.9		8.0
Approach LOS		C			B		A		A

Intersection Summary

Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.37
 Intersection Signal Delay: 9.7 Intersection LOS: A
 Intersection Capacity Utilization 67.6% ICU Level of Service C
 Analysis Period (min) 15

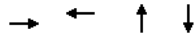
Splits and Phases: 8: Kerr Street & Stewart Street



Queues

8: Kerr Street & Stewart Street

02/29/2024



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	70	136	462	435
w/c Ratio	0.25	0.37	0.35	0.36
Control Delay	23.5	14.0	7.9	8.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.5	14.0	7.9	8.0
Queue Length 50th (m)	8.5	7.8	19.0	17.8
Queue Length 95th (m)	15.7	18.1	56.6	54.3
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)				
Base Capacity (vph)	447	551	1307	1212
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced w/c Ratio	0.16	0.25	0.35	0.36
Intersection Summary				

HCM Signalized Intersection Capacity Analysis

8: Kerr Street & Stewart Street

02/29/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	35	25	5	20	35	70	5	400	20	40	330	30
Future Volume (vph)	35	25	5	20	35	70	5	400	20	40	330	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.4			5.4			5.4			5.4	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		1.00			0.97			1.00			0.99	
Flpb, ped/bikes		0.99			1.00			1.00			1.00	
Frt		0.99			0.92			0.99			0.99	
Flt Protected		0.97			0.99			1.00			1.00	
Satd. Flow (prot)		1656			1609			1849			1825	
Flt Permitted		0.80			0.94			1.00			0.93	
Satd. Flow (perm)		1354			1526			1843			1705	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	27	5	22	38	76	5	435	22	43	359	33
RTOR Reduction (vph)	0	4	0	0	63	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	66	0	0	73	0	0	461	0	0	432	0
Confl. Peds. (#/hr)	20		15	15		20	35		25	25		35
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2			1	6
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.2			13.2			51.0			51.0	
Effective Green, g (s)		13.2			13.2			51.0			51.0	
Actuated g/C Ratio		0.18			0.18			0.68			0.68	
Clearance Time (s)		5.4			5.4			5.4			5.4	
Vehicle Extension (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		238			268			1253			1159	
v/s Ratio Prot												
v/s Ratio Perm		c0.05			0.05			0.25			c0.25	
v/c Ratio		0.28			0.27			0.37			0.37	
Uniform Delay, d1		26.8			26.8			5.1			5.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.9			0.8			0.8			0.2	
Delay (s)		27.6			27.5			6.0			5.3	
Level of Service		C			C			A			A	
Approach Delay (s)		27.6			27.5			6.0			5.3	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay				9.7				HCM 2000 Level of Service			A	
HCM 2000 Volume to Capacity ratio				0.37								
Actuated Cycle Length (s)				75.0				Sum of lost time (s)			13.8	
Intersection Capacity Utilization				67.6%				ICU Level of Service			C	
Analysis Period (min)				15								

c Critical Lane Group

Lanes, Volumes, Timings

9: Speers Internal Road 1 & Speers Road

02/29/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕		↕
Traffic Volume (vph)	1415	15	0	900	0	20
Future Volume (vph)	1415	15	0	900	0	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.998					0.865
Flt Protected						
Satd. Flow (prot)	3603	0	0	3610	0	1644
Flt Permitted						
Satd. Flow (perm)	3603	0	0	3610	0	1644
Link Speed (k/h)	60			60	20	
Link Distance (m)	147.2			113.4	44.5	
Travel Time (s)	8.8			6.8	8.0	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1444	15	0	918	0	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1459	0	0	918	0	20
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	49.6%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

9: Speers Internal Road 1 & Speers Road

02/29/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕		↕
Traffic Volume (veh/h)	1415	15	0	900	0	20
Future Volume (Veh/h)	1415	15	0	900	0	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	1444	15	0	918	0	20
Pedestrians	1			1		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	147			347		
pX, platoon unblocked			0.83		0.85	0.83
vC, conflicting volume			1459		1912	730
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1134		1497	251
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	97
cM capacity (veh/h)			515		98	622

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	963	496	459	459	20
Volume Left	0	0	0	0	0
Volume Right	0	15	0	0	20
cSH	1700	1700	1700	1700	622
Volume to Capacity	0.57	0.29	0.27	0.27	0.03
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.8
Control Delay (s)	0.0	0.0	0.0	0.0	11.0
Lane LOS					B
Approach Delay (s)	0.0		0.0		11.0
Approach LOS					B


Intersection Summary

Average Delay	0.1
Intersection Capacity Utilization	49.6%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/29/2024


						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	0	20	0	0	15	0
Future Volume (vph)	0	20	0	0	15	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected						0.950
Satd. Flow (prot)	1644	0	1900	0	0	1805
Flt Permitted						0.950
Satd. Flow (perm)	1644	0	1900	0	0	1805
Link Speed (k/h)	20					
Link Distance (m)	67.5		49.5		44.5	
Travel Time (s)	12.2		8.9		8.0	
Confl. Peds. (#/hr)	8					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%					
Adj. Flow (vph)	0	25	0	0	19	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	25	0	0	0	0	19
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6					
Link Offset(m)	0.0					
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	14		24	
Sign Control	Stop		Free		Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	15.7%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/29/2024

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	0	20	0	0	15	0
Future Volume (Veh/h)	0	20	0	0	15	0
Sign Control	Stop		Free		Free	
Grade	0%					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	25	0	0	19	0
Pedestrians	2					
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage						1
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	40	8	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	40	8	0			
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			99	
cM capacity (veh/h)	964	1072			1636	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	25	0	19
Volume Left	0	0	19
Volume Right	25	0	0
cSH	1072	1700	1636
Volume to Capacity	0.02	0.00	0.01
Queue Length 95th (m)	0.5	0.0	0.3
Control Delay (s)	8.4	0.0	7.2
Lane LOS	A		A
Approach Delay (s)	8.4	0.0	7.2
Approach LOS	A		

Intersection Summary			
Average Delay	7.9		
Intersection Capacity Utilization	15.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
12: Underground & Speers Internal Road

02/29/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (vph)	10	10	10	0	20	30
Future Volume (vph)	10	10	10	0	20	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.932			0.919		
Flt Protected			0.950	0.981		
Satd. Flow (prot)	1771	0	0	1805	1713	0
Flt Permitted			0.950	0.981		
Satd. Flow (perm)	1771	0	0	1805	1713	0
Link Speed (k/h)	20		20	20		
Link Distance (m)	67.5		44.6	38.9		
Travel Time (s)	12.2		8.0	7.0		
Confl. Peds. (#/hr)				10		
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	13	13	13	0	25	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	26	0	0	13	63	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0		0.0	3.6		
Link Offset(m)	0.0		0.0	0.0		
Crosswalk Width(m)	1.6		1.6	1.6		
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	17.2%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
12: Underground & Speers Internal Road

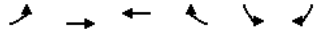
02/29/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (veh/h)	10	10	10	0	20	30
Future Volume (Veh/h)	10	10	10	0	20	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	13	13	13	0	25	38
Pedestrians	10			3		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	1			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			26		56	22
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			26		56	22
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	96
cM capacity (veh/h)			1601		941	1057
Direction, Lane #						
	EB 1	WB 1	NB 1			
Volume Total	26	13	63			
Volume Left	0	13	25			
Volume Right	13	0	38			
cSH	1700	1601	1008			
Volume to Capacity	0.02	0.01	0.06			
Queue Length 95th (m)	0.0	0.2	1.5			
Control Delay (s)	0.0	7.3	8.8			
Lane LOS		A	A			
Approach Delay (s)	0.0	7.3	8.8			
Approach LOS			A			
Intersection Summary						
Average Delay			6.4			
Intersection Capacity Utilization			17.2%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings

13: Speers Internal Road/30 Speers & Speers Internal Road 2

02/29/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑		↑	↑	
Traffic Volume (vph)	40	0	0	20	5	10
Future Volume (vph)	40	0	0	20	5	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.865	0.910	
Flt Protected		0.950			0.984	
Satd. Flow (prot)	0	1504	0	1644	1575	0
Flt Permitted		0.950			0.984	
Satd. Flow (perm)	0	1504	0	1644	1575	0
Link Speed (k/h)		20	20		20	
Link Distance (m)		44.6	43.4		49.2	
Travel Time (s)		8.0	7.8		8.9	
Confl. Peds. (#/hr)	2			2	7	
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63
Heavy Vehicles (%)	20%	0%	0%	0%	0%	12%
Adj. Flow (vph)	63	0	0	32	8	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	63	0	32	24	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		24		14	24	14
Sign Control		Stop	Stop		Free	

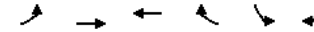
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.9%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

13: Speers Internal Road/30 Speers & Speers Internal Road 2

02/29/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑		↑	↑	
Traffic Volume (veh/h)	40	0	0	20	5	10
Future Volume (Veh/h)	40	0	0	20	5	10
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63
Hourly flow rate (vph)	63	0	0	32	8	16
Pedestrians		3	7		2	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.1	1.1		1.1	
Percent Blockage		0	1		0	
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	61	34	42	9	7	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	61	34	42	9	7	
tC, single (s)	7.3	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.7	4.0	4.0	3.3	2.2	
p0 queue free %	93	100	100	97	100	
cM capacity (veh/h)	852	850	842	1070	1616	

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	63	32	24
Volume Left	63	0	8
Volume Right	0	32	16
cSH	852	1070	1616
Volume to Capacity	0.07	0.03	0.00
Queue Length 95th (m)	1.8	0.7	0.1
Control Delay (s)	9.6	8.5	2.4
Lane LOS	A	A	A
Approach Delay (s)	9.6	8.5	2.4
Approach LOS	A	A	

Intersection Summary

Average Delay		7.8	
Intersection Capacity Utilization	18.9%		ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/29/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (vph)	0	1435	0	15	875	0	25	0	40	0	0	0
Future Volume (vph)	0	1435	0	15	875	0	25	0	40	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt												
Flt Protected												
Satd. Flow (prot)	0	3539	0	0	3537	0	0	1709	0	0	1863	0
Flt Permitted												
Satd. Flow (perm)	0	3539	0	0	3537	0	0	1709	0	0	1863	0
Link Speed (k/h)	60											
Link Distance (m)	113.4											
Travel Time (s)	6.8											
Confl. Peds. (#/hr)	8											
Confl. Bikes (#/hr)	1											
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Heavy Vehicles (%)	2%											
Adj. Flow (vph)	0	1511	0	16	921	0	26	0	42	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1511	0	0	937	0	0	68	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	3.6											
Link Offset(m)	0.0											
Crosswalk Width(m)	1.6											
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24											
Sign Control	Free											

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	50.2%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/29/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (veh/h)	0	1435	0	15	875	0	25	0	40	0	0	0
Future Volume (Veh/h)	0	1435	0	15	875	0	25	0	40	0	0	0
Sign Control	Free											
Grade	0%											
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Hourly flow rate (vph)	0	1511	0	16	921	0	26	0	42	0	0	0
Pedestrians	4											
Lane Width (m)	3.6											
Walking Speed (m/s)	1.1											
Percent Blockage	0											
Right turn flare (veh)	1											
Median type	None											
Median storage (veh)												
Upstream signal (m)	261											
pX, platoon unblocked	0.94											
vC, conflicting volume	921											
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	795											
tC, single (s)	4.1											
tC, 2 stage (s)												
tF (s)	2.2											
p0 queue free %	100											
cM capacity (veh/h)	775											

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1007	504	323	614	68	0
Volume Left	0	0	16	0	26	0
Volume Right	0	0	0	0	42	0
cSH	1700	1700	477	1700	141	1700
Volume to Capacity	0.59	0.30	0.03	0.36	0.48	0.00
Queue Length 95th (m)	0.0	0.0	0.8	0.0	17.1	0.0
Control Delay (s)	0.0	0.0	1.1	0.0	52.5	0.0
Lane LOS	A		F		A	
Approach Delay (s)	0.0		0.4		52.5	
Approach LOS	F		A		A	

Intersection Summary

Average Delay	1.6
Intersection Capacity Utilization	50.2%
ICU Level of Service	A
Analysis Period (min)	15

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

02/29/2024

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖		↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	160	600	140	300	880	505	150	175	235	305	295	40
Future Volume (vph)	160	600	140	300	880	505	150	175	235	305	295	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	105.0		0.0	75.0		100.0	50.0		45.0	0.0		0.0
Storage Lanes	1		0	1		1	1		1	1		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99		1.00		0.94	0.97		0.93	0.96	0.99	
Frt		0.972				0.850			0.850		0.982	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	3431	0	1752	3539	1583	1787	1900	1599	1787	1850	0
Flt Permitted	0.230			0.232			0.293			0.452		
Satd. Flow (perm)	434	3431	0	427	3539	1485	536	1900	1486	817	1850	0
Right Turn on Red			Yes			Yes		Yes			Yes	
Satd. Flow (RTOR)		28				467			247		6	
Link Speed (kh)		60			60			50			50	
Link Distance (m)		235.8			147.2			127.4			167.2	
Travel Time (s)		14.1			8.8			9.2			12.0	
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Adj. Flow (vph)	168	632	147	316	926	532	158	184	247	321	311	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	168	779	0	316	926	532	158	184	247	321	353	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

FTPM 2031 50 Speers Road 12:51 pm 02/29/2024 2031 Future Total PM
BA Group - SUK

Synchro 11 Report
Page 1

Lanes, Volumes, Timings
1: Kerr Street & Speers Road

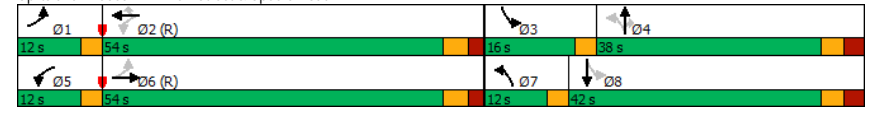
02/29/2024

	↖	→	↘	↙	←	↖	↙	↘	↙	↘	↙	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2		2	4		4	8		
Detector Phase	1	6		5	2	2	7	4	4	3	8	
Switch Phase												
Minimum Initial (s)	7.0	25.0		7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0	
Minimum Split (s)	10.0	30.9		10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3	
Total Split (s)	12.0	54.0		12.0	54.0	54.0	12.0	38.0	38.0	16.0	42.0	
Total Split (%)	10.0%	45.0%		10.0%	45.0%	45.0%	10.0%	31.7%	31.7%	13.3%	35.0%	
Maximum Green (s)	9.0	48.1		9.0	48.1	48.1	9.0	31.7	31.7	13.0	35.7	
Yellow Time (s)	3.0	3.7		3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3	
All-Red Time (s)	0.0	2.2		0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	2.5	5.5		2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	
Recall Mode	None	C-Min		None	C-Min	C-Min	None	None	None	None	None	
Walk Time (s)		7.0			7.0	7.0		7.0	7.0		7.0	
Flash Dont Walk (s)		14.0			14.0	14.0		14.0	14.0		14.0	
Pedestrian Calls (#/hr)		15			15	15		35	35		35	
Act Effect Green (s)	61.2	49.0		69.0	54.8	54.8	35.7	23.1	23.1	44.0	28.4	
Actuated g/C Ratio	0.51	0.41		0.58	0.46	0.46	0.30	0.19	0.19	0.37	0.24	
v/c Ratio	0.51	0.55		0.77	0.57	0.57	0.62	0.50	0.51	0.77	0.80	
Control Delay	18.9	28.1		30.9	26.9	6.6	37.1	46.7	8.3	43.0	55.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	18.9	28.1		30.9	26.9	6.6	37.1	46.7	8.3	43.0	55.7	
LOS	B	C		C	C	A	D	D	A	D	E	
Approach Delay		26.5			21.5			28.0			49.6	
Approach LOS		C			C			C			D	

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 49 (41%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 28.4
 Intersection Capacity Utilization 86.4%
 Analysis Period (min) 15
 Intersection LOS: C
 ICU Level of Service E

Splits and Phases: 1: Kerr Street & Speers Road



FTPM 2031 50 Speers Road 12:51 pm 02/29/2024 2031 Future Total PM
BA Group - SUK

Synchro 11 Report
Page 2

Timings
1: Kerr Street & Speers Road

02/29/2024

	↖	→	↙	←	↘	↖	↙	↘	↖	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	160	600	300	880	505	150	175	235	305	295
Future Volume (vph)	160	600	300	880	505	150	175	235	305	295
Turn Type	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	1	6	5	2		7	4		3	8
Permitted Phases	6	2		2	4		4	8		
Detector Phase	1	6	5	2	2	7	4	4	3	8
Switch Phase										
Minimum Initial (s)	7.0	25.0	7.0	25.0	25.0	7.0	10.0	10.0	7.0	10.0
Minimum Split (s)	10.0	30.9	10.0	30.9	30.9	10.0	34.3	34.3	10.0	34.3
Total Split (s)	12.0	54.0	12.0	54.0	54.0	12.0	38.0	38.0	16.0	42.0
Total Split (%)	10.0%	45.0%	10.0%	45.0%	45.0%	10.0%	31.7%	31.7%	13.3%	35.0%
Yellow Time (s)	3.0	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.0	3.3
All-Red Time (s)	0.0	2.2	0.0	2.2	2.2	0.0	3.0	3.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Min	None	C-Min	C-Min	None	None	None	None	None
Act Effect Green (s)	61.2	49.0	69.0	54.8	54.8	35.7	23.1	23.1	44.0	28.4
Actuated g/C Ratio	0.51	0.41	0.58	0.46	0.46	0.30	0.19	0.19	0.37	0.24
v/c Ratio	0.51	0.55	0.77	0.57	0.57	0.62	0.50	0.51	0.77	0.80
Control Delay	18.9	28.1	30.9	26.9	6.6	37.1	46.7	8.3	43.0	55.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	28.1	30.9	26.9	6.6	37.1	46.7	8.3	43.0	55.7
LOS	B	C	C	C	A	D	D	A	D	E
Approach Delay		26.5		21.5			28.0			49.6
Approach LOS		C		C			C			D

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 49 (41%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 28.4 Intersection LOS: C
 Intersection Capacity Utilization 86.4% ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 1: Kerr Street & Speers Road



Queues
1: Kerr Street & Speers Road

02/29/2024

	↖	→	↙	←	↘	↖	↙	↘	↖	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	168	779	316	926	532	158	184	247	321	353
v/c Ratio	0.51	0.55	0.77	0.57	0.57	0.62	0.50	0.51	0.77	0.80
Control Delay	18.9	28.1	30.9	26.9	6.6	37.1	46.7	8.3	43.0	55.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	28.1	30.9	26.9	6.6	37.1	46.7	8.3	43.0	55.7
Queue Length 50th (m)	17.2	70.9	35.9	83.5	8.6	25.6	38.4	0.0	57.9	77.1
Queue Length 95th (m)	32.3	90.0	#95.6	113.8	39.6	37.6	55.9	19.4	76.3	102.8
Internal Link Dist (m)		211.8		123.2		103.4			143.2	
Turn Bay Length (m)	105.0		75.0		100.0	50.0		45.0		
Base Capacity (vph)	334	1430	413	1616	932	257	501	574	417	554
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.54	0.77	0.57	0.57	0.61	0.37	0.43	0.77	0.64

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

1: Kerr Street & Speers Road

02/29/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	160	600	140	300	880	505	150	175	235	305	295	40
Future Volume (vph)	160	600	140	300	880	505	150	175	235	305	295	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frb, ped/bikes	1.00	0.99		1.00	1.00	0.94	1.00	1.00	0.93	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00	1.00	0.98	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1802	3430		1751	3539	1485	1775	1900	1486	1758	1850	
Flt Permitted	0.23	1.00		0.23	1.00	1.00	0.29	1.00	1.00	0.45	1.00	
Satd. Flow (perm)	437	3430		429	3539	1485	547	1900	1486	837	1850	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	168	632	147	316	926	532	158	184	247	321	311	42
RTOR Reduction (vph)	0	17	0	0	0	254	0	0	199	0	5	0
Lane Group Flow (vph)	168	762	0	316	926	278	158	184	48	321	348	0
Confl. Peds. (#/hr)	30		5	5		30	35		35	35		35
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2		2	4		4	8		
Actuated Green, G (s)	58.2	48.9		67.1	54.8	54.8	32.5	23.2	23.2	40.7	28.4	
Effective Green, g (s)	58.2	48.9		67.1	54.8	54.8	32.5	23.2	23.2	40.7	28.4	
Actuated g/C Ratio	0.49	0.41		0.56	0.46	0.46	0.27	0.19	0.19	0.34	0.24	
Clearance Time (s)	3.0	5.9		3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	
Vehicle Extension (s)	2.5	5.5		2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	
Lane Grp Cap (vph)	317	1397		407	1616	678	243	367	287	395	437	
v/s Ratio Prot	0.04	0.22		c0.10	0.26		0.05	0.10		c0.10	0.19	
v/s Ratio Perm	0.22			c0.34		0.19	0.13		0.03	c0.18		
v/c Ratio	0.53	0.55		0.78	0.57	0.41	0.65	0.50	0.17	0.81	0.80	
Uniform Delay, d1	18.5	27.1		16.8	24.0	21.8	35.6	43.2	40.3	33.8	43.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	1.5		8.7	1.5	1.8	5.5	1.5	0.4	11.8	10.3	
Delay (s)	19.7	28.6		25.5	25.5	23.6	41.1	44.7	40.7	45.5	53.4	
Level of Service	B	C		C	C	C	D	D	D	D	D	
Approach Delay (s)		27.0			24.9			42.1			49.6	
Approach LOS		C			C			D			D	

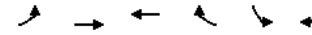
Intersection Summary			
HCM 2000 Control Delay	32.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	86.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

2: Speers Road & Cross Avenue

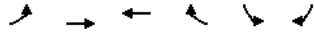
02/29/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	270	850	1260	15	10	420
Future Volume (vph)	270	850	1260	15	10	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	80.0			0.0	45.0	0.0
Storage Lanes	1			0	1	2
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	0.88
Ped Bike Factor	1.00		1.00			
Frt			0.998			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1703	3610	3566	0	1805	2733
Flt Permitted	0.124				0.950	
Satd. Flow (perm)	222	3610	3566	0	1805	2733
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			1			307
Link Speed (k/h)		60	60		48	
Link Distance (m)		233.1	101.5		84.0	
Travel Time (s)		14.0	6.1		6.3	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Adj. Flow (vph)	281	885	1313	16	10	438
Shared Lane Traffic (%)						
Lane Group Flow (vph)	281	885	1329	0	10	438
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.6	3.6		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24			14	24	14
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (m)	2.0	10.0	10.0		2.0	2.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	2.0	0.6	0.6		2.0	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(m)		9.4	9.4			
Detector 2 Size(m)		0.6	0.6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lanes, Volumes, Timings
2: Speers Road & Cross Avenue

02/29/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type	pm+pt	NA	NA	Prot	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Detector Phase	5	2	6		4	4
Switch Phase						
Minimum Initial (s)	6.0	38.0	38.0		10.0	10.0
Minimum Split (s)	12.0	47.6	47.6		15.8	15.8
Total Split (s)	17.0	102.0	85.0		38.0	38.0
Total Split (%)	12.1%	72.9%	60.7%		27.1%	27.1%
Maximum Green (s)	11.0	95.4	78.4		32.2	32.2
Yellow Time (s)	4.0	3.7	3.7		3.3	3.3
All-Red Time (s)	2.0	2.9	2.9		2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6		5.8	5.8
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Recall Mode	None	C-Min	C-Min		None	None
Walk Time (s)		10.0	10.0			
Flash Dont Walk (s)		31.0	31.0			
Pedestrian Calls (#/hr)		5	5			
Act Effect Green (s)	114.1	113.5	83.4		14.1	14.1
Actuated g/C Ratio	0.82	0.81	0.60		0.10	0.10
v/c Ratio	0.64	0.30	0.63		0.06	0.80
Control Delay	23.3	3.9	20.3		54.5	29.1
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	23.3	3.9	20.3		54.5	29.1
LOS	C	A	C		D	C
Approach Delay		8.6	20.3		29.7	
Approach LOS		A	C		C	

Intersection Summary

Area Type: Other
 Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 13 (9%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 17.1 Intersection LOS: B
 Intersection Capacity Utilization 73.9% ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 2: Speers Road & Cross Avenue



Timings
2: Speers Road & Cross Avenue

02/29/2024

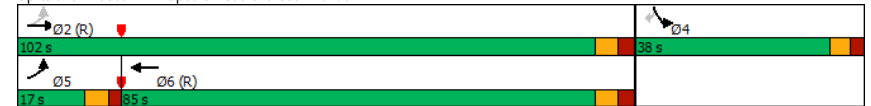


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↕↕	↕↕	↔	↕↕
Traffic Volume (vph)	270	850	1260	10	420
Future Volume (vph)	270	850	1260	10	420
Turn Type	pm+pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2				4
Detector Phase	5	2	6	4	4
Switch Phase					
Minimum Initial (s)	6.0	38.0	38.0	10.0	10.0
Minimum Split (s)	12.0	47.6	47.6	15.8	15.8
Total Split (s)	17.0	102.0	85.0	38.0	38.0
Total Split (%)	12.1%	72.9%	60.7%	27.1%	27.1%
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	None	None
Act Effect Green (s)	114.1	113.5	83.4	14.1	14.1
Actuated g/C Ratio	0.82	0.81	0.60	0.10	0.10
v/c Ratio	0.64	0.30	0.63	0.06	0.80
Control Delay	23.3	3.9	20.3	54.5	29.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	3.9	20.3	54.5	29.1
LOS	C	A	C	D	C
Approach Delay		8.6	20.3	29.7	
Approach LOS		A	C	C	

Intersection Summary

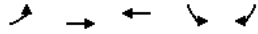
Cycle Length: 140
 Actuated Cycle Length: 140
 Offset: 13 (9%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
 Natural Cycle: 80
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.80
 Intersection Signal Delay: 17.1 Intersection LOS: B
 Intersection Capacity Utilization 73.9% ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 2: Speers Road & Cross Avenue



Queues
2: Speers Road & Cross Avenue

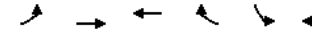
02/29/2024



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	281	885	1329	10	438
w/c Ratio	0.64	0.30	0.63	0.06	0.80
Control Delay	23.3	3.9	20.3	54.5	29.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.3	3.9	20.3	54.5	29.1
Queue Length 50th (m)	27.2	25.4	113.7	2.6	20.0
Queue Length 95th (m)	63.3	43.2	157.3	7.8	38.8
Internal Link Dist (m)		209.1	77.5	60.0	
Turn Bay Length (m)	80.0		45.0		
Base Capacity (vph)	436	2927	2129	415	864
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced w/c Ratio	0.64	0.30	0.62	0.02	0.51
Intersection Summary					

HCM Signalized Intersection Capacity Analysis
2: Speers Road & Cross Avenue

02/29/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗↗	↗↗		↘	↗↗
Traffic Volume (vph)	270	850	1260	15	10	420
Future Volume (vph)	270	850	1260	15	10	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.6	6.6		5.8	5.8
Lane Util. Factor	1.00	0.95	0.95		1.00	0.88
Frbp, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1703	3610	3567		1805	2733
Flt Permitted	0.12	1.00	1.00		0.95	1.00
Satd. Flow (perm)	223	3610	3567		1805	2733
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	281	885	1312	16	10	438
RTOR Reduction (vph)	0	0	0	0	0	276
Lane Group Flow (vph)	281	885	1329	0	10	162
Confl. Peds. (#/hr)	5			5		
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	113.5	113.5	83.3		14.1	14.1
Effective Green, g (s)	113.5	113.5	83.3		14.1	14.1
Actuated g/C Ratio	0.81	0.81	0.59		0.10	0.10
Clearance Time (s)	6.0	6.6	6.6		5.8	5.8
Vehicle Extension (s)	3.5	5.0	5.0		3.0	3.0
Lane Grp Cap (vph)	436	2926	2122		181	275
v/s Ratio Prot	c0.11	0.25	0.37		0.01	
v/s Ratio Perm	c0.41					c0.06
w/c Ratio	0.64	0.30	0.63		0.06	0.59
Uniform Delay, d1	22.3	3.3	18.3		56.9	60.2
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.4	0.3	1.4		0.1	3.2
Delay (s)	25.7	3.6	19.7		57.1	63.4
Level of Service	C	A	B		E	E
Approach Delay (s)		8.9	19.7		63.2	
Approach LOS		A	B		E	
Intersection Summary						
HCM 2000 Control Delay		22.1			HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio		0.65				
Actuated Cycle Length (s)		140.0			Sum of lost time (s)	18.4
Intersection Capacity Utilization		73.9%			ICU Level of Service	D
Analysis Period (min)		15				
c Critical Lane Group						

Lanes, Volumes, Timings
3: St. Augustine Drive & Speers Road

02/29/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔			↔				↔		↔	
Traffic Volume (vph)	10	810	25	0	1045	25	5	0	25	5	0	0
Future Volume (vph)	10	810	25	0	1045	25	5	0	25	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	50.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	1		0	0		0	0		1	0		0
Taper Length (m)	2.5			2.5			2.5			2.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.996			0.997				0.865			
Flt Protected	0.950						0.950				0.950	
Satd. Flow (prot)	1805	3557	0	0	3564	0	0	0	1644	0	1805	0
Flt Permitted	0.950						0.950				0.950	
Satd. Flow (perm)	1805	3557	0	0	3564	0	0	0	1644	0	1805	0
Link Speed (k/h)		60			60				40			30
Link Distance (m)		248.1			235.8				188.1			117.6
Travel Time (s)		14.9			14.1				16.9			14.1
Confl. Peds. (#/hr)	8		5	5		8	1		1	1		1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	10	844	26	0	1089	26	5	0	26	5	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	870	0	0	1115	0	0	5	26	0	5	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Right	Left	Left	Right	Right
Median Width(m)		3.6			3.6				0.0			0.0
Link Offset(m)		0.0			0.0				0.0			0.0
Crosswalk Width(m)		1.6			1.6				1.6			1.6
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free				Stop			Stop

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
3: St. Augustine Drive & Speers Road

02/29/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔			↔				↔		↔	
Traffic Volume (veh/h)	10	810	25	0	1045	25	5	0	25	5	0	0
Future Volume (Veh/h)	10	810	25	0	1045	25	5	0	25	5	0	0
Sign Control		Free			Free				Stop			Stop
Grade		0%			0%				0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	10	844	26	0	1089	26	5	0	26	5	0	0
Pedestrians		1			1				5			8
Lane Width (m)		3.6			3.6				3.6			3.6
Walking Speed (m/s)		1.1			1.1				1.1			1.1
Percent Blockage		0			0				0			1
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)					236							
pX, platoon unblocked	0.81						0.81	0.81		0.81	0.81	0.81
vC, conflicting volume	1123				875		1428	2005	441	1579	2005	566
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	673				875		1051	1767	441	1239	1767	0
tC, single (s)	4.1				4.1		7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2				2.2		3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99				100		97	100	95	95	100	100
cM capacity (veh/h)	742				776		145	67	566	100	67	873

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1
Volume Total	10	563	307	726	389	31	5
Volume Left	10	0	0	0	0	5	5
Volume Right	0	0	26	0	26	26	0
cSH	742	1700	1700	1700	1700	385	100
Volume to Capacity	0.01	0.33	0.18	0.43	0.23	0.08	0.05
Queue Length 95th (m)	0.3	0.0	0.0	0.0	0.0	2.0	1.2
Control Delay (s)	9.9	0.0	0.0	0.0	0.0	15.2	42.8
Lane LOS	A					C	E
Approach Delay (s)	0.1			0.0		15.2	42.8
Approach LOS						C	E

Intersection Summary	
Average Delay	0.4
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min)	15

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

02/29/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	35	5	30	90	10	150	120	595	110	170	550	50
Future Volume (vph)	35	5	30	90	10	150	120	595	110	170	550	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Ped Bike Factor					0.98			1.00			1.00	
Frt		0.941			0.919			0.980			0.990	
Flt Protected		0.976			0.982			0.992			0.989	
Satd. Flow (prot)	0	1711	0	0	1664	0	0	3453	0	0	3505	0
Flt Permitted		0.800			0.850			0.716			0.614	
Satd. Flow (perm)	0	1402	0	0	1432	0	0	2492	0	0	2175	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		33			90			24			14	
Link Speed (k/h)		40			50			50			50	
Link Distance (m)		89.6			265.3			167.2			26.5	
Travel Time (s)		8.1			19.1			12.0			1.9	
Confl. Peds. (#/hr)				13		6			4	4		
Peak Hour Factor	0.92	0.92	0.92	0.97	0.92	0.97	0.92	0.97	0.97	0.97	0.97	0.92
Heavy Vehicles (%)	2%	2%	2%	3%	2%	1%	2%	1%	2%	0%	1%	2%
Adj. Flow (vph)	38	5	33	93	11	155	130	613	113	175	567	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	76	0	0	259	0	0	856	0	0	796	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2			1	6
Permitted Phases		4			8			2			6	

Lanes, Volumes, Timings
4: Kerr Street & Shepherd Road

02/29/2024

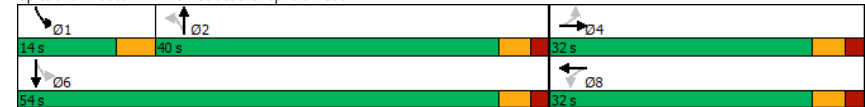


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		18.0	18.0		7.0	18.0	
Minimum Split (s)	23.4	23.4		23.4	23.4		28.2	28.2		11.0	28.2	
Total Split (s)	32.0	32.0		32.0	32.0		40.0	40.0		14.0	54.0	
Total Split (%)	37.2%	37.2%		37.2%	37.2%		46.5%	46.5%		16.3%	62.8%	
Maximum Green (s)	26.6	26.6		26.6	26.6		34.8	34.8		10.0	48.8	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		4.0	3.3	
All-Red Time (s)	2.1	2.1		2.1	2.1		1.9	1.9		0.0	1.9	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.4			5.4			5.2			5.2	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.5	3.5		2.5	3.5	
Recall Mode	None	None		None	None		Min	Min		None	Min	
Walk Time (s)	7.0	7.0		7.0	7.0		10.0	10.0			10.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		13.0	13.0			13.0	
Pedestrian Calls (#/hr)	0	0		0	0		5	5			5	
Act Effct Green (s)		14.2			14.2			28.9			28.9	
Actuated g/C Ratio		0.26			0.26			0.53			0.53	
v/c Ratio		0.20			0.59			0.64			0.69	
Control Delay		13.8			19.5			11.4			12.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		13.8			19.5			11.4			12.9	
LOS		B			B			B			B	
Approach Delay		13.8			19.5			11.4			12.9	
Approach LOS		B			B			B			B	

Intersection Summary

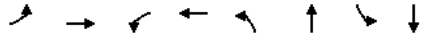
Area Type:	Other
Cycle Length:	86
Actuated Cycle Length:	54.5
Natural Cycle:	65
Control Type:	Semi Act-Uncoord
Maximum v/c Ratio:	0.69
Intersection Signal Delay:	13.2
Intersection Capacity Utilization:	75.5%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	D

Splits and Phases: 4: Kerr Street & Shepherd Road



Timings
4: Kerr Street & Shepherd Road

02/29/2024

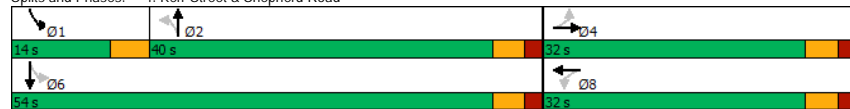


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔		↔		↕		↕
Traffic Volume (vph)	35	5	90	10	120	595	170	550
Future Volume (vph)	35	5	90	10	120	595	170	550
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	18.0	18.0	7.0	18.0
Minimum Split (s)	23.4	23.4	23.4	23.4	28.2	28.2	11.0	28.2
Total Split (s)	32.0	32.0	32.0	32.0	40.0	40.0	14.0	54.0
Total Split (%)	37.2%	37.2%	37.2%	37.2%	46.5%	46.5%	16.3%	62.8%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	4.0	3.3
All-Red Time (s)	2.1	2.1	2.1	2.1	1.9	1.9	0.0	1.9
Lost Time Adjust (s)		0.0		0.0		0.0		0.0
Total Lost Time (s)		5.4		5.4		5.2		5.2
Lead/Lag					Lag	Lag	Lead	
Lead-Lag Optimize?					Yes	Yes	Yes	
Recall Mode	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)		14.2		14.2		28.9		28.9
Actuated g/C Ratio		0.26		0.26		0.53		0.53
v/c Ratio		0.20		0.59		0.64		0.69
Control Delay		13.8		19.5		11.4		12.9
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		13.8		19.5		11.4		12.9
LOS		B		B		B		B
Approach Delay		13.8		19.5		11.4		12.9
Approach LOS		B		B		B		B

Intersection Summary

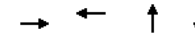
Cycle Length: 86
 Actuated Cycle Length: 54.5
 Natural Cycle: 65
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 0.69
 Intersection Signal Delay: 13.2
 Intersection LOS: B
 Intersection Capacity Utilization 75.5%
 ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 4: Kerr Street & Shepherd Road



Queues
4: Kerr Street & Shepherd Road

02/29/2024



Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	76	259	856	796
v/c Ratio	0.20	0.59	0.64	0.69
Control Delay	13.8	19.5	11.4	12.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	13.8	19.5	11.4	12.9
Queue Length 50th (m)	2.9	12.4	23.5	23.0
Queue Length 95th (m)	14.9	45.1	55.4	55.6
Internal Link Dist (m)	65.6	241.3	143.2	2.5
Turn Bay Length (m)				
Base Capacity (vph)	754	797	1808	1909
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.10	0.32	0.47	0.42

Intersection Summary

HCM Signalized Intersection Capacity Analysis

4: Kerr Street & Shepherd Road

02/29/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	35	5	30	90	10	150	120	595	110	170	550	50
Future Volume (vph)	35	5	30	90	10	150	120	595	110	170	550	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4			5.4			5.2			5.2		
Lane Util. Factor	1.00			1.00			0.95			0.95		
Frb, ped/bikes	1.00			0.99			1.00			1.00		
Flpb, ped/bikes	1.00			1.00			1.00			1.00		
Frt	0.94			0.92			0.98			0.99		
Flt Protected	0.98			0.98			0.99			0.99		
Satd. Flow (prot)	1711			1662			3456			3504		
Flt Permitted	0.80			0.85			0.72			0.61		
Satd. Flow (perm)	1402			1438			2492			2175		
Peak-hour factor, PHF	0.92	0.92	0.92	0.97	0.92	0.97	0.92	0.97	0.97	0.97	0.97	0.92
Adj. Flow (vph)	38	5	33	93	11	155	130	613	113	175	567	54
RTOR Reduction (vph)	0	24	0	0	66	0	0	11	0	0	6	0
Lane Group Flow (vph)	0	52	0	0	193	0	0	845	0	0	790	0
Confl. Peds. (#/hr)				13			6			4		
Heavy Vehicles (%)	2%	2%	2%	3%	2%	1%	2%	1%	2%	0%	1%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases	4			8			2			1		
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	14.2			14.2			28.9			28.9		
Effective Green, g (s)	14.2			14.2			28.9			28.9		
Actuated g/C Ratio	0.26			0.26			0.54			0.54		
Clearance Time (s)	5.4			5.4			5.2			5.2		
Vehicle Extension (s)	3.0			3.0			3.5			3.5		
Lane Grp Cap (vph)	370			380			1341			1170		
v/s Ratio Prot												
v/s Ratio Perm	0.04			c0.13			0.34			c0.36		
v/c Ratio	0.14			0.51			0.63			0.67		
Uniform Delay, d1	15.1			16.8			8.7			9.0		
Progression Factor	1.00			1.00			1.00			1.00		
Incremental Delay, d2	0.2			1.1			1.0			1.6		
Delay (s)	15.3			17.8			9.7			10.6		
Level of Service	B			B			A			B		
Approach Delay (s)	15.3			17.8			9.7			10.6		
Approach LOS	B			B			A			B		

Intersection Summary			
HCM 2000 Control Delay	11.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	53.7	Sum of lost time (s)	14.6
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

5: Kerr Street & Wycroft Road

02/29/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↔	↔	
Traffic Volume (vph)	25	165	135	645	605	110
Future Volume (vph)	25	165	135	645	605	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	75.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	2.5		2.5			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor				0.979		
Frt	0.883			0.979		
Flt Protected	0.993		0.950			
Satd. Flow (prot)	1610		1703		1849	
Flt Permitted	0.993		0.950			
Satd. Flow (perm)	1610		1703		1849	
Link Speed (k/h)	50		50		50	
Link Distance (m)	561.6		442.6		98.1	
Travel Time (s)	40.4		31.9		7.1	
Confl. Peds. (#/hr)			5		5	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	4%	6%	0%	0%	4%
Adj. Flow (vph)	27	176	144	686	644	117

Shared Lane Traffic (%)						
Lane Group Flow (vph)	203	0	144	686	761	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6		3.6	3.6		
Link Offset(m)	0.0		0.0	0.0		
Crosswalk Width(m)	1.6		1.6	1.6		
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24			14
Sign Control	Stop		Free		Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	67.7%
ICU Level of Service	C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

5: Kerr Street & Wyecroft Road

02/29/2024

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔		↔	
Traffic Volume (veh/h)	25	165	135	645	605	110
Future Volume (Veh/h)	25	165	135	645	605	110
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	27	176	144	686	644	117
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1682	708	766			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1682	708	766			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	69	59	83			
cM capacity (veh/h)	86	430	826			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	203	144	686	761		
Volume Left	27	144	0	0		
Volume Right	176	0	0	117		
cSH	281	826	1700	1700		
Volume to Capacity	0.72	0.17	0.40	0.45		
Queue Length 95th (m)	38.9	4.8	0.0	0.0		
Control Delay (s)	45.1	10.3	0.0	0.0		
Lane LOS	E	B				
Approach Delay (s)	45.1	1.8	0.0			
Approach LOS	E					
Intersection Summary						
Average Delay			5.9			
Intersection Capacity Utilization			67.7%		ICU Level of Service C	
Analysis Period (min)	15					

Lanes, Volumes, Timings

6: Kerr Street & Prince Charles Drive

02/29/2024

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔		↔		↔		↔		↔	
Traffic Volume (vph)	10	0	10	10	0	30	5	520	10	20	690	25
Future Volume (vph)	10	0	10	10	0	30	5	520	10	20	690	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt	0.932		0.900		0.997		0.995					
Flt Protected	0.976		0.987		0.999							
Satd. Flow (prot)	0	1728	0	0	1688	0	0	1873	0	0	1849	0
Flt Permitted	0.976		0.987		0.999							
Satd. Flow (perm)	0	1728	0	0	1688	0	0	1873	0	0	1849	0
Link Speed (k/h)	40		40		50		50					
Link Distance (m)	57.8		56.0		134.8		127.4					
Travel Time (s)	5.2		5.0		9.7		9.2					
Confl. Peds. (#/hr)	4	1		1	4	21	31		31			
Confl. Bikes (#/hr)							1					
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	50%	0%	0%	0%	0%	20%	1%	0%	5%	2%	4%
Adj. Flow (vph)	11	0	11	11	0	32	5	547	11	21	726	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	22	0	0	43	0	0	563	0	0	773	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0		0.0		0.0		0.0		3.6			
Link Offset(m)	0.0		0.0		0.0		0.0		0.0			
Crosswalk Width(m)	1.6		1.6		1.6		1.6		1.6			
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14		24	14		24	14		24	14	
Sign Control	Stop		Stop		Free		Free		Free			
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	61.9%						ICU Level of Service B					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

6: Kerr Street & Prince Charles Drive

02/29/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	10	0	10	10	0	30	5	520	10	20	690	25
Future Volume (Veh/h)	10	0	10	10	0	30	5	520	10	20	690	25
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	0	11	11	0	32	5	547	11	21	726	26
Pedestrians	21			31			1			4		
Lane Width (m)	3.6			3.6			3.6			3.6		
Walking Speed (m/s)	1.1			1.1			1.1			1.1		
Percent Blockage	2			3			0			0		
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (m)							238			127		
pX, platoon unblocked	0.75	0.75	0.71	0.75	0.75	0.93	0.71				0.93	
vC, conflicting volume	1400	1401	761	1386	1408	588	773				589	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1155	1156	461	1137	1166	519	478				520	
tC, single (s)	7.1	7.0	6.2	7.1	6.5	6.2	4.3				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.5	3.3	3.5	4.0	3.3	2.4				2.2	
p0 queue free %	90	100	97	91	100	94	99				98	
cM capacity (veh/h)	113	111	421	120	135	505	696				931	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	22	43	563	773								
Volume Left	11	11	5	21								
Volume Right	11	32	11	26								
cSH	178	278	696	931								
Volume to Capacity	0.12	0.15	0.01	0.02								
Queue Length 95th (m)	3.1	4.1	0.2	0.5								
Control Delay (s)	28.0	20.3	0.2	0.6								
Lane LOS	D	C	A	A								
Approach Delay (s)	28.0	20.3	0.2	0.6								
Approach LOS	D	C										
Intersection Summary												
Average Delay	1.5											
Intersection Capacity Utilization	61.9%			ICU Level of Service			B					
Analysis Period (min)	15											

Lanes, Volumes, Timings

7: Kerr Street & Elmwood Road

02/29/2024



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Volume (vph)	15	10	5	520	670	40
Future Volume (vph)	15	10	5	520	670	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.945				0.992	
Fit Protected	0.971					
Satd. Flow (prot)	1675	0	0	1860	1843	0
Fit Permitted	0.971					
Satd. Flow (perm)	1675	0	0	1860	1843	0
Link Speed (k/h)	40		50		50	
Link Distance (m)	171.2		103.0		134.8	
Travel Time (s)	15.4		7.4		9.7	
Confl. Peds. (#/hr)	1	2	34			34
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	10%	20%	2%	2%	7%
Adj. Flow (vph)	16	11	5	547	705	42
Shared Lane Traffic (%)						
Lane Group Flow (vph)	27	0	0	552	747	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	24	14		
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	48.5%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

7: Kerr Street & Elmwood Road

02/29/2024



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔		
Traffic Volume (veh/h)	15	10	5	520	670	40
Future Volume (Veh/h)	15	10	5	520	670	40
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	11	5	547	705	42
Pedestrians	34		2		1	
Lane Width (m)	3.6		3.6		3.6	
Walking Speed (m/s)	1.1		1.1		1.1	
Percent Blockage	3		0		0	
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (m)			103		262	
pX, platoon unblocked	0.80	0.75	0.75			
vC, conflicting volume	1318	762	781			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	989	512	537			
tC, single (s)	6.4	6.3	4.3			
tC, 2 stage (s)						
tF (s)	3.5	3.4	2.4			
p0 queue free %	92	97	99			
cM capacity (veh/h)	211	395	685			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	27	552	747			
Volume Left	16	5	0			
Volume Right	11	0	42			
cSH	261	685	1700			
Volume to Capacity	0.10	0.01	0.44			
Queue Length 95th (m)	2.6	0.2	0.0			
Control Delay (s)	20.4	0.2	0.0			
Lane LOS	C	A				
Approach Delay (s)	20.4	0.2	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			48.5%		ICU Level of Service A	
Analysis Period (min)			15			

Lanes, Volumes, Timings

8: Kerr Street & Stewart Street

02/29/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Volume (vph)	50	10	15	10	15	75	10	400	15	55	575	50
Future Volume (vph)	50	10	15	10	15	75	10	400	15	55	575	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.97		0.96		1.00		1.00		0.99			
Frt	0.973		0.898		0.995		0.990					
Flt Protected	0.968		0.995		0.999		0.996					
Satd. Flow (prot)	0	1705	0	0	1577	0	0	1856	0	0	1831	0
Flt Permitted	0.771		0.967		0.983		0.934					
Satd. Flow (perm)	0	1333	0	0	1530	0	0	1826	0	0	1715	0
Right Turn on Red	Yes						Yes		Yes			
Satd. Flow (RTOR)	16		82		3		8					
Link Speed (k/h)	40		40		50		50					
Link Distance (m)	95.6		60.6		165.0		103.0					
Travel Time (s)	8.6		5.5		11.9		7.4					
Confl. Peds. (#/hr)	20		15	15		20	35		25	25		35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Adj. Flow (vph)	54	11	16	11	16	82	11	435	16	60	625	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	81	0	0	109	0	0	462	0	0	739	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0		0.0		0.0		0.0					
Link Offset(m)	0.0		0.0		0.0		0.0					
Crosswalk Width(m)	1.6		1.6		1.6		1.6					
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0		2.0	10.0		2.0	10.0		2.0	10.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2			1	6
Permitted Phases		4			8			2			6	

Lanes, Volumes, Timings
8: Kerr Street & Stewart Street

02/29/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2		1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		24.0	24.0		6.0	24.0	
Minimum Split (s)	30.0	30.0		30.0	30.0		32.0	32.0		10.0	32.0	
Total Split (s)	30.0	30.0		30.0	30.0		35.0	35.0		10.0	45.0	
Total Split (%)	40.0%	40.0%		40.0%	40.0%		46.7%	46.7%		13.3%	60.0%	
Maximum Green (s)	24.6	24.6		24.6	24.6		29.6	29.6		7.0	39.6	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.0	3.3	
All-Red Time (s)	2.1	2.1		2.1	2.1		2.1	2.1		0.0	2.1	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.4			5.4			5.4			5.4	
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.0	4.0	
Recall Mode	None	None		None	None		C-Min	C-Min		None	C-Min	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Flash Dont Walk (s)	13.0	13.0		13.0	13.0		14.0	14.0		14.0	14.0	
Pedestrian Calls (#/hr)	20	20		20	20		35	35		35	35	
Act Effect Green (s)		15.2			15.2			53.2			53.2	
Actuated g/C Ratio		0.20			0.20			0.71			0.71	
v/c Ratio		0.29			0.29			0.36			0.61	
Control Delay		21.5			9.9			8.0			12.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		21.5			9.9			8.0			12.2	
LOS		C			A			A			B	
Approach Delay		21.5			9.9			8.0			12.2	
Approach LOS		C			A			A			B	

Intersection Summary

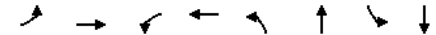
Area Type: Other
 Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 11.2 Intersection LOS: B
 Intersection Capacity Utilization 84.7% ICU Level of Service E
 Analysis Period (min) 15

Splits and Phases: 8: Kerr Street & Stewart Street



Timings
8: Kerr Street & Stewart Street

02/29/2024

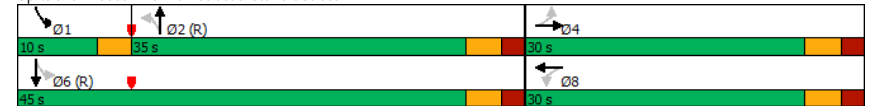


Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		↔		↔		↔	↔		↔
Traffic Volume (vph)	50	10		10	15	10	400	55	575
Future Volume (vph)	50	10		10	15	10	400	55	575
Turn Type	Perm	NA		Perm	NA	Perm	NA	pm+pt	NA
Protected Phases		4		8		2	2	1	6
Permitted Phases	4			8		2		6	
Detector Phase	4	4		8	8	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0		10.0	10.0	24.0	24.0	6.0	24.0
Minimum Split (s)	30.0	30.0		30.0	30.0	32.0	32.0	10.0	32.0
Total Split (s)	30.0	30.0		30.0	30.0	35.0	35.0	10.0	45.0
Total Split (%)	40.0%	40.0%		40.0%	40.0%	46.7%	46.7%	13.3%	60.0%
Yellow Time (s)	3.3	3.3		3.3	3.3	3.3	3.3	3.0	3.3
All-Red Time (s)	2.1	2.1		2.1	2.1	2.1	2.1	0.0	2.1
Lost Time Adjust (s)		0.0			0.0		0.0		0.0
Total Lost Time (s)		5.4			5.4		5.4		5.4
Lead/Lag						Lag	Lag	Lead	
Lead-Lag Optimize?						Yes	Yes	Yes	
Recall Mode	None	None		None	None	C-Min	C-Min	None	C-Min
Act Effect Green (s)		15.2			15.2		53.2		53.2
Actuated g/C Ratio		0.20			0.20		0.71		0.71
v/c Ratio		0.29			0.29		0.36		0.61
Control Delay		21.5			9.9		8.0		12.2
Queue Delay		0.0			0.0		0.0		0.0
Total Delay		21.5			9.9		8.0		12.2
LOS		C			A		A		B
Approach Delay		21.5			9.9		8.0		12.2
Approach LOS		C			A		A		B

Intersection Summary

Cycle Length: 75
 Actuated Cycle Length: 75
 Offset: 13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 11.2 Intersection LOS: B
 Intersection Capacity Utilization 84.7% ICU Level of Service E
 Analysis Period (min) 15

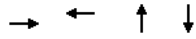
Splits and Phases: 8: Kerr Street & Stewart Street



Queues

8: Kerr Street & Stewart Street

02/29/2024



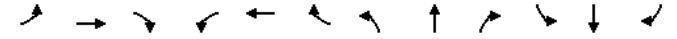
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	81	109	462	739
w/c Ratio	0.29	0.29	0.36	0.61
Control Delay	21.5	9.9	8.0	12.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.5	9.9	8.0	12.2
Queue Length 50th (m)	8.5	3.4	19.2	40.1
Queue Length 95th (m)	16.4	13.0	56.9	122.1
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)				
Base Capacity (vph)	447	556	1295	1217
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced w/c Ratio	0.18	0.20	0.36	0.61

Intersection Summary

HCM Signalized Intersection Capacity Analysis

8: Kerr Street & Stewart Street

02/29/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	50	10	15	10	15	75	10	400	15	55	575	50
Future Volume (vph)	50	10	15	10	15	75	10	400	15	55	575	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.4			5.4			5.4			5.4	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.99			0.96			1.00			0.99	
Flpb, ped/bikes		0.98			1.00			1.00			1.00	
Frt		0.97			0.90			1.00			0.99	
Flt Protected		0.97			0.99			1.00			1.00	
Satd. Flow (prot)		1675			1575			1856			1828	
Flt Permitted		0.77			0.97			0.98			0.93	
Satd. Flow (perm)		1334			1530			1826			1715	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	11	16	11	16	82	11	435	16	60	625	54
RTOR Reduction (vph)	0	13	0	0	68	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	68	0	0	41	0	0	461	0	0	736	0
Confl. Peds. (#/hr)	20		15	15		20	35		25	25		35
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.2			13.2			51.0			51.0	
Effective Green, g (s)		13.2			13.2			51.0			51.0	
Actuated g/C Ratio		0.18			0.18			0.68			0.68	
Clearance Time (s)		5.4			5.4			5.4			5.4	
Vehicle Extension (s)		4.0			4.0			4.0			4.0	
Lane Grp Cap (vph)		234			269			1241			1166	
v/s Ratio Prot												
v/s Ratio Perm		c0.05			0.03			0.25			c0.43	
v/c Ratio		0.29			0.15			0.37			0.63	
Uniform Delay, d1		26.8			26.2			5.1			6.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.9			0.4			0.9			1.1	
Delay (s)		27.8			26.5			6.0			7.9	
Level of Service		C			C			A			A	
Approach Delay (s)		27.8			26.5			6.0			7.9	
Approach LOS		C			C			A			A	

Intersection Summary

HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	13.8
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings

9: Speers Internal Road 1 & Speers Road

02/29/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕		↕
Traffic Volume (vph)	1085	60	0	1685	0	20
Future Volume (vph)	1085	60	0	1685	0	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.992					0.865
Flt Protected						
Satd. Flow (prot)	3581	0	0	3610	0	1644
Flt Permitted						
Satd. Flow (perm)	3581	0	0	3610	0	1644
Link Speed (k/h)	60			60	20	
Link Distance (m)	147.2			113.4	44.5	
Travel Time (s)	8.8			6.8	8.0	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	1107	61	0	1719	0	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1168	0	0	1719	0	20
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	1.6			1.6	1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		14	24		24	14
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	49.9%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

9: Speers Internal Road 1 & Speers Road

02/29/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕			↕↕		↕
Traffic Volume (veh/h)	1085	60	0	1685	0	20
Future Volume (Veh/h)	1085	60	0	1685	0	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	1107	61	0	1719	0	20
Pedestrians	1			1		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	147			347		
pX, platoon unblocked			0.85		0.83	0.85
vC, conflicting volume			1168		1998	585
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			838		965	149
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	97
cM capacity (veh/h)			682		213	742

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	738	430	860	860	20
Volume Left	0	0	0	0	0
Volume Right	0	61	0	0	20
cSH	1700	1700	1700	1700	742
Volume to Capacity	0.43	0.25	0.51	0.51	0.03
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.6
Control Delay (s)	0.0	0.0	0.0	0.0	10.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		10.0
Approach LOS					A

Intersection Summary

Average Delay	0.1
Intersection Capacity Utilization	49.9%
Analysis Period (min)	15
	ICU Level of Service A

Lanes, Volumes, Timings

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/29/2024

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	20	0	0	55	5
Future Volume (vph)	0	20	0	0	55	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected						0.956
Satd. Flow (prot)	1644	0	1900	0	0	1816
Flt Permitted						0.956
Satd. Flow (perm)	1644	0	1900	0	0	1816
Link Speed (k/h)	20		20		20	
Link Distance (m)	67.5		49.5		44.5	
Travel Time (s)	12.2		8.9		8.0	
Confl. Peds. (#/hr)	8					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	0	25	0	0	70	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	25	0	0	0	0	76
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	1.6		1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24	14	14		24	
Sign Control	Stop		Free		Free	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	15.7% ICU Level of Service A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

10: 80 Speers/Speers Internal Road 1 & Speers Internal Road

02/29/2024

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	20	0	0	55	5
Future Volume (Veh/h)	0	20	0	0	55	5
Sign Control	Stop		Free		Free	
Grade	0%					
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	25	0	0	70	6
Pedestrians	2					
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	0					1
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	148	8	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	148	8	0			
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			96	
cM capacity (veh/h)	811	1072			1636	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	25	0	76
Volume Left	0	0	70
Volume Right	25	0	0
cSH	1072	1700	1636
Volume to Capacity	0.02	0.00	0.04
Queue Length 95th (m)	0.5	0.0	1.0
Control Delay (s)	8.4	0.0	6.7
Lane LOS	A		A
Approach Delay (s)	8.4	0.0	6.7
Approach LOS	A		

Intersection Summary			
Average Delay	7.2		
Intersection Capacity Utilization	15.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
12: Underground & Speers Internal Road

02/29/2024

	→	↖	↗	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (vph)	25	25	20	10	15	10
Future Volume (vph)	25	25	20	10	15	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.932			0.945		
Flt Protected			0.968	0.971		
Satd. Flow (prot)	1771	0	0	1839	1743	0
Flt Permitted			0.968	0.971		
Satd. Flow (perm)	1771	0	0	1839	1743	0
Link Speed (k/h)	20		20	20		
Link Distance (m)	67.5		44.6	38.9		
Travel Time (s)	12.2		8.0	7.0		
Confl. Peds. (#/hr)				10		
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	32	32	25	13	19	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	64	0	0	38	32	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0		0.0	3.6		
Link Offset(m)	0.0		0.0	0.0		
Crosswalk Width(m)	1.6		1.6	1.6		
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		14	24	24	24	14
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	18.3%		ICU Level of Service A			
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
12: Underground & Speers Internal Road

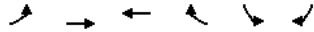
02/29/2024

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↖	↗	↗
Traffic Volume (veh/h)	25	25	20	10	15	10
Future Volume (Veh/h)	25	25	20	10	15	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	32	32	25	13	19	13
Pedestrians	10			3		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	1			0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			64		121	51
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			64		121	51
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		98	99
cM capacity (veh/h)			1551		857	1020
Direction, Lane #						
	EB 1	WB 1	NB 1			
Volume Total	64	38	32			
Volume Left	0	25	19			
Volume Right	32	0	13			
cSH	1700	1551	917			
Volume to Capacity	0.04	0.02	0.03			
Queue Length 95th (m)	0.0	0.4	0.8			
Control Delay (s)	0.0	4.9	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	4.9	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			3.6			
Intersection Capacity Utilization	18.3%		ICU Level of Service A			
Analysis Period (min)	15					

Lanes, Volumes, Timings

13: Speers Internal Road/30 Speers & Speers Internal Road 2

02/29/2024



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑		↑	↑	
Traffic Volume (vph)	15	20	0	10	0	30
Future Volume (vph)	15	20	0	10	0	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.865	0.865		
Flt Protected		0.979				
Satd. Flow (prot)	0	1713	0	1644	1467	0
Flt Permitted		0.979				
Satd. Flow (perm)	0	1713	0	1644	1467	0
Link Speed (k/h)		20	20		20	
Link Distance (m)		44.6	43.4		49.2	
Travel Time (s)		8.0	7.8		8.9	
Confl. Peds. (#/hr)	2			2	7	
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63
Heavy Vehicles (%)	20%	0%	0%	0%	0%	12%
Adj. Flow (vph)	24	32	0	16	0	48
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	56	0	16	48	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.6	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		24		14	24	14
Sign Control		Stop	Stop		Free	

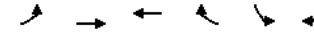
Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	18.5%
Analysis Period (min)	15
	ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis

13: Speers Internal Road/30 Speers & Speers Internal Road 2

02/29/2024



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑		↑	↑	
Traffic Volume (veh/h)	15	20	0	10	0	30
Future Volume (Veh/h)	15	20	0	10	0	30
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63
Hourly flow rate (vph)	24	32	0	16	0	48
Pedestrians		3	7		2	
Lane Width (m)		3.6	3.6		3.6	
Walking Speed (m/s)		1.1	1.1		1.1	
Percent Blockage		0	1		0	
Right turn flare (veh)						
Median type					None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	45	34	58	9	7	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	45	34	58	9	7	
tC, single (s)	7.3	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.7	4.0	4.0	3.3	2.2	
p0 queue free %	97	96	100	99	100	
cM capacity (veh/h)	890	855	829	1070	1616	

Direction, Lane #

	EB 1	WB 1	SB 1
Volume Total	56	16	48
Volume Left	24	0	0
Volume Right	0	16	48
cSH	869	1070	1616
Volume to Capacity	0.06	0.01	0.00
Queue Length 95th (m)	1.6	0.3	0.0
Control Delay (s)	9.4	8.4	0.0
Lane LOS	A	A	
Approach Delay (s)	9.4	8.4	0.0
Approach LOS	A	A	

Intersection Summary

Average Delay		5.5	
Intersection Capacity Utilization	18.5%		ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/29/2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (vph)	0	1105	5	25	1660	0	20	0	10	5	0	5
Future Volume (vph)	0	1105	5	25	1660	0	20	0	10	5	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999						0.954			0.932	
Flt Protected					0.999			0.968			0.976	
Satd. Flow (prot)	0	3536	0	0	3537	0	0	1755	0	0	1694	0
Flt Permitted					0.999			0.968			0.976	
Satd. Flow (perm)	0	3536	0	0	3537	0	0	1755	0	0	1694	0
Link Speed (k/h)		60			60			20			20	
Link Distance (m)		113.4			233.1			49.2			39.0	
Travel Time (s)		6.8			14.0			8.9			7.0	
Confl. Peds. (#/hr)			8	8								
Confl. Bikes (#/hr)				1								
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	0%	0%	2%	2%	0%	2%	0%	2%	2%	2%
Adj. Flow (vph)	0	1163	5	26	1747	0	21	0	11	5	0	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1168	0	0	1773	0	0	32	0	0	10	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	73.6%
ICU Level of Service	D
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

14: Speers Internal Road 2/41 Speers Driveways & Speers Road

02/29/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Traffic Volume (veh/h)	0	1105	5	25	1660	0	20	0	10	5	0	5
Future Volume (Veh/h)	0	1105	5	25	1660	0	20	0	10	5	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Hourly flow rate (vph)	0	1163	5	26	1747	0	21	0	11	5	0	5
Pedestrians		4			4			8			8	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.1			1.1			1.1			1.1	
Percent Blockage		0			0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)		261			233							
pX, platoon unblocked	0.75			0.87			0.81	0.81	0.87	0.81	0.81	0.75
vC, conflicting volume	1747			1176			2108	2972	596	2396	2975	878
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1329			905			1190	2251	239	1543	2254	169
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			81	100	98	92	100	99
cM capacity (veh/h)	386			657			112	32	662	60	32	632

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	775	393	608	1165	32	10
Volume Left	0	0	26	0	21	5
Volume Right	0	5	0	0	11	5
cSH	1700	1700	657	1700	157	110
Volume to Capacity	0.46	0.23	0.04	0.69	0.20	0.09
Queue Length 95th (m)	0.0	0.0	0.0	0.9	5.6	2.2
Control Delay (s)	0.0	0.0	1.1	0.0	33.7	41.0
Lane LOS			A		D	E
Approach Delay (s)	0.0		0.4		33.7	41.0
Approach LOS			D		E	

Intersection Summary

Average Delay	0.7
Intersection Capacity Utilization	73.6%
ICU Level of Service	D
Analysis Period (min)	15

Appendix I

OTM Book 12 Excerpts



OTM BOOK 12 - JUSTIFICATION 7 - SPEERS ROAD / SPEERS SERVICE ROAD (EAST ACCESS)

STEP 1

	All Approaches	Minor Streets	Major Street	Combined Vehicle and Pedestrian Crossing Artery from Minor Streets	
amPHV	2390	65	2325	45	(25+0 +20 peds) Lefts + peds
pmPHV	2835	40	2795	40	(20+0 + 20 peds) Lefts + peds
AHV	1306	26	1280	23	AHV = (amPHV+pmPHV)/4
		1B		2B	

STEP 2

JUSTIFICATION 7

Justification	Description	Minimum Requirement 1 Lane Highways		Minimum Requirement 2 or more lanes		Compliance		
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Sectional		ENTIRE
						Numerical	%	%
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)				900	1306	145%	15%
	B. Vehicle volume, along minor streets (average hour)				170	26	15%	
2. Delay to cross traffic	A. Vehicle volume, major street (average hour)				900	1280	142%	31%
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)				75	23	31%	

**Note: For "T" intersections, these values should be increased by 50%. (The intersection is a "T" configuration thus values are increased in the above table.)*

Analysis Using Average Hour Volume

For traffic signals to be considered, Justification 7 as per Table 21 is used but with a 20% increase over the required volumes for an existing intersection and a 50% increase for a future intersection or roadway.

Result:	31%
Required:	150%
	NOT WARRANTED

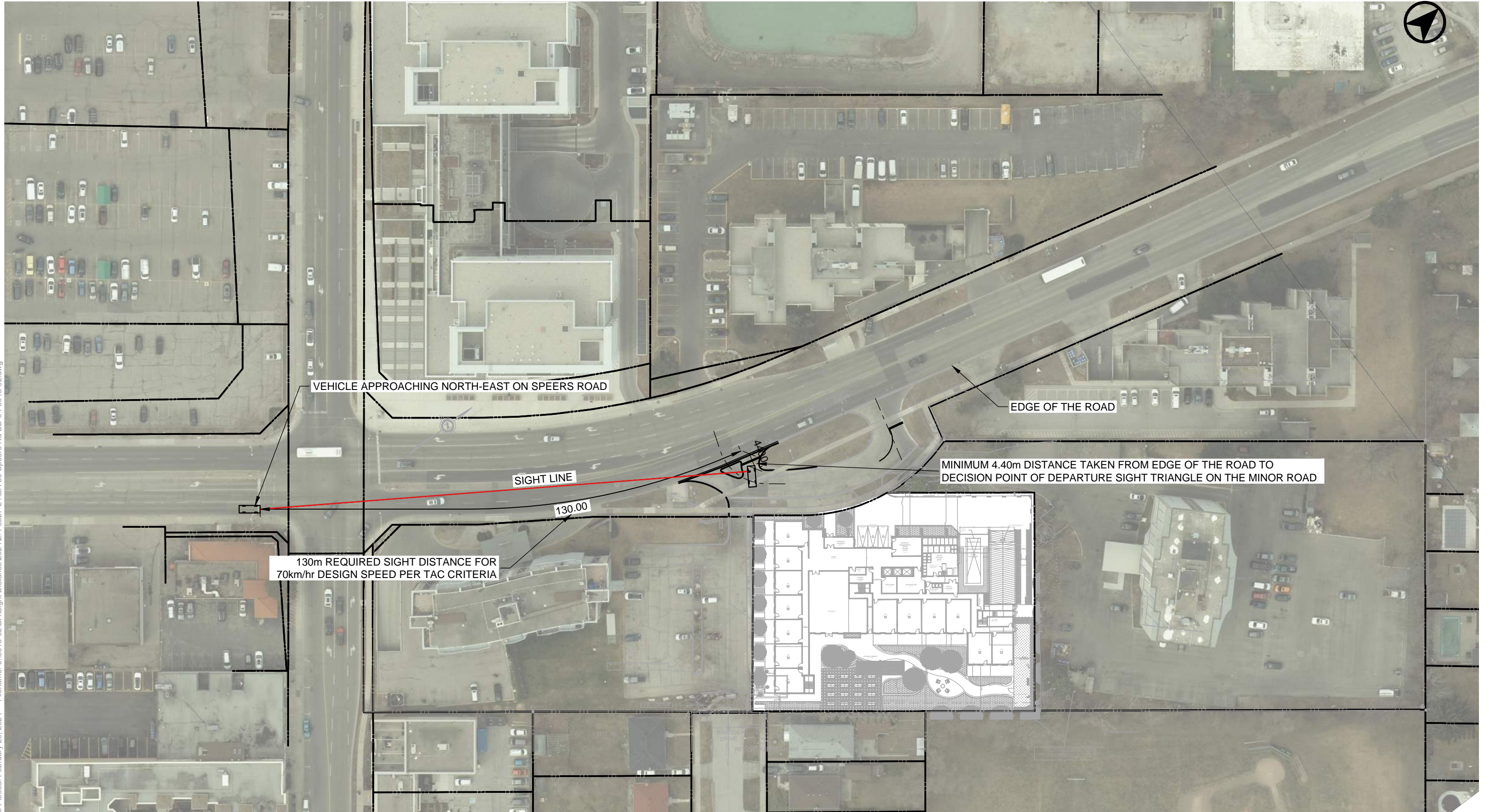
	am	pm	peds
EBT	1435		1105
EBR	0		5
WBL	15		25
WBT	875		1660
NBL	25		20
NBR	40		10
SBL	0		5
SBR	0		5
	2390		2835
1A	1306.25		
1B	65		26.25
2A	2325		1280
2B	22.5		

Appendix J

Sight Distance Assessment



Date Plotted: February 29, 2024 File: J:\8013-02\BA\Sight Distance\2024\2. Feb27-24\BA-50 Speers Rd-SD-04-8013-02.dwg



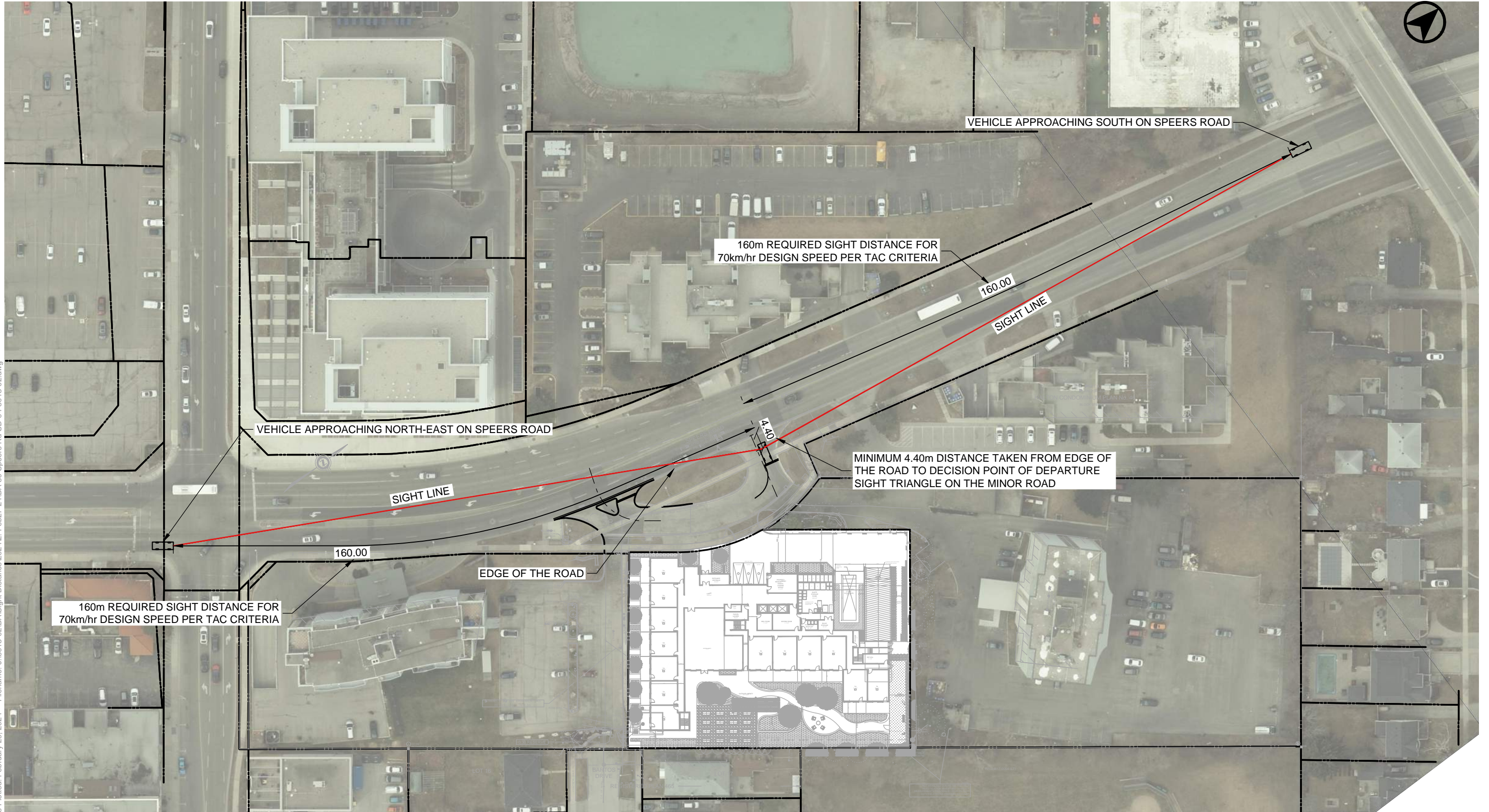
50 SPEERS ROAD
 RIGHT-IN RIGHT-OUT ACCESS
 TAC MINIMUM SIGHT LINE REVIEW
 CASE B2 - RIGHT TURN FROM THE MINOR ROAD

Project: 50 SPEERS ROAD
 Project No. 8013-02
 Date: OCTOBER 3, 2022
 Revised: FEBRUARY 27, 2024



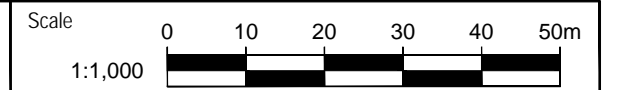
Drawing No. **SD-01**

Date Plotted: February 29, 2024 File: J:\8013-02\BA\Sight Distance\2024\2. Feb27-24\BA-50 Speers Rd-SD-04-3013-02.dwg



50 SPEERS ROAD
 ALL MANOEUVRE ACCESS
 TAC MINIMUM SIGHT LINE REVIEW
 CASE B1 - LEFT TURN FROM THE MINOR ROAD

Project: 50 SPEERS ROAD
 Project No: 8013-02
 Date: OCTOBER 3, 2022
 Revised: FEBRUARY 27, 2024



Drawing No. **SD-02**

Appendix K

Functional Design and Pavement Marking & Signage Plan






GENERAL NOTES

1. ARCHITECTURAL PLAN DATED JANUARY XX, PREPARED BY XX.
2. SURVEY DATED XX, PREPARED BY XX.

05	02-27-24	TC	ISSUED FOR SUBMISSION
04	02-06-24	MA	ISSUED TO CLIENT FOR PRELIMINARY REVIEW
03	01-16-24	MA	ISSUED TO CLIENT FOR PRELIMINARY REVIEW
02	11-29-23	TC	ISSUED FOR INTERNAL COORDINATION
01	04-3-23	MA	ISSUED FOR INTERNAL COORDINATION
00	MM-DD-YR	INT	REVISION NOTE


 BA Consulting Group Ltd.
 300 - 45 St. Clair Ave. W.
 Toronto ON M4V 1K9
 TEL: 416 961 7110
 EMAIL: bagroup@bagroup.com

**MOVEMENT
IN URBAN
ENVIRONMENTS**
 BAGROUP.COM

50 SPEERS ROAD

FUNCTIONAL PLAN

ACCESS IMPROVEMENTS

CHANNELIZED ACCESS

Date: February 27, 2024

Project No.: 8013-02



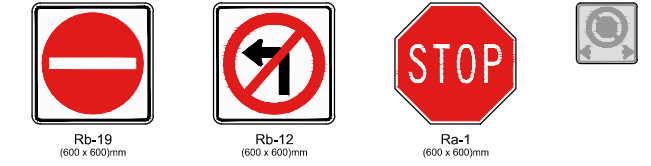
FD-01



GENERAL NOTES

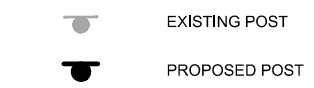
1. ARCHITECTURAL PLAN DATED JANUARY XX, PREPARED BY XX.
2. SURVEY DATED XX, PREPARED BY XX.

SIGN LEGEND



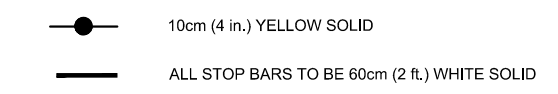
SIGN MOUNT LEGEND

ALL SIGNS ARE SHOWN IN APPROXIMATE LOCATIONS AND TO BE DETERMINED ON SITE. SIGNS MUST BE VISIBLE TO DRIVER AND NOT OBSTRUCTED BY LANDSCAPE.



PAVEMENT MARKING:

(NOTE-ALL MARKINGS MUST CONFORM TO THE ONTARIO TRAFFIC MANUAL (OTM) BOOK 11



01	02-27-24	TC	ISSUED FOR SUBMISSION
00	MM-DD-YR	INT	REVISION NOTE



BA Consulting Group Ltd.
300 - 45 St. Clair Ave. W.
Toronto ON M4V 1K9
TEL: 416 961 7110
EMAIL: bagroup@bagroup.com

**MOVEMENT
IN URBAN
ENVIRONMENTS**
BAGROUP.COM

50 SPEERS ROAD

**SIGNAGE AND PAVEMENT
MARKING PLAN**

ACCESS IMPROVEMENTS

Date: February 27, 2024

Project No.: 8013-02

Scale: 1:500

SN-01