



BA Group

UPPER KERR VILLAGE REVISED PART 2 TRANSPORTATION ASSESSMENT - OFFICIAL PLAN AMENDMENT

Transportation Considerations Report

Prepared For: Urban Strategies Inc.

February 2, 2022

Revised May 20 2022



**MOVEMENT
IN URBAN
ENVIRONMENTS**
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1.0 INTRODUCTION

1.1 Overview – Revised Transportation Impact Study (TIS) Report

BA Group has been retained by Urban Strategies Inc. to prepare a transportation impact assessment (TIA) on behalf of April Investments Limited (owner of 588 Kerr Street), 527079 Ontario Limited (owner of 530 Kerr Street), Trans County Development Corporation Limited (owner of 131 Speers Road), and Oakville Developments (2010) Inc. (owner of 550 Kerr Street) (together known as the “landowners”). BA Group prepared a report entitled “*Upper Kerr Village, Part 2 Transportation Assessment – Official Plan Amendment – Transportation Considerations Report*”, dated February 2 2022 (referred to herein as the February 2022 TIS Report). That report supported an Official Plan Amendment (OPA) to permit the redevelopment and intensification of lands municipally addressed 530, 550 and 580 Kerr Street, 131 and 171 Speers Road (together know as the “Subject Site” and that forms a portion of what is referred to as the Upper Kerr Village District) in the Town of Oakville (the “Town”), Halton Region (the “Region”).

The February 2022 TIS Report was submitted to the Town of Oakville and preliminary comments were recently received from Town staff. This included comments from the transportation staff, planning staff and emergency services staff.

In addition to the recent Town staff comments on the February 2022 TIS Report, an announcement by Metrolinx in March 2022 confirmed that the planned Kerr Street Underpass project that would create a grade-separated rail-road condition along Kerr Street, north of Speers Road would be indefinitely postponed; however, not cancelled. In response to the Metrolinx announcement, Town of Oakville staff requested additional analyses to investigate the implications of the underpass deferral on the above referenced OPA to permit redevelopment and intensification of the Subject Site.

In light of these two recent developments (preliminary Town comments on the February 2022 TIS Report and the Metrolinx announcement and Town request for additional analyses), the February 2022 TIS Report is being updated to address both. This May 2022 Revised TIS Report incorporates responses to the Town’s preliminary comments and the implications of the deferred Kerr Street Underpass project on the OPA Lands. Both the preliminary Town comments (April, 25 2022 email correspondence) and the request for additional analyses related to the deferral of the Kerr Street Underpass project (April 7 2022 email correspondence) are contained in **Appendix A**.

1.2 PROPOSED OPA CONTEXT

The portion of the Upper Kerr Village District that forms the subject OPA (referred to herein as the Subject Site) is bounded by Speers Road on the south, Kerr Street on the east, the CN Rail corridor on the north, and the west limit of the property known municipally as 171 Speers Road (See **Appendix B, Schedule O1**, the lands north of Speers Road and west of Kerr Street and **Figure 1, Site Context Plan**). The owners of the property at 171 Speers Road are not a direct party to the OPA submission; however, further to Official Plan policies, their lands have been considered in the Comprehensive Development Plan (Proposal) and its proposed future development structure. The involvement of the lands at 171 Speers Road is addressed in **Section 5.2.3, Phasing Implications Associated with 171 Speers Road** as well as in the traffic operations assessment portion of **Section 8.0, Network Capacity Analyses**.



The Proposal and its implementing OPA will permit the intensification of the Subject Site. The intensification characteristics are set out in the Draft OPA and associated Schedules prepared by Urban Strategies Inc. as resubmitted in May 2022. The Draft OPA provisions incorporate the goals, objectives and policies set out in Part E – Growth Areas, Special Policy Areas and Exceptions, Kerr Village (See **Appendix C**) when establishing the intensification parameters for the overall Block and individual properties. **Table 1** sets out what the Draft OPA will generally permit in terms of the overall intensification across the Subject Site and on individual properties.

TABLE 1 OVERALL DEVELOPMENT POTENTIAL ACROSS THE SUBJECT SITE

Site by Property	Area	Residential Units	Retail GFA (m ²)
588 Kerr St	Area A	428	923
550 Kerr St	Area B	428	1,941
530 Kerr St & 131 Speers Rd	Area C	516	4,071
171 Speers Rd	Area D	470	980
TOTAL		1,842 (rounded to 1,850 units)	7,915

Source: USI Land Use estimates based upon Draft OPA provisions, Revised May 2022

The Draft OPA and associated intensification levels take into consideration the approved grade separation of Kerr Street and the CN Rail corridor when establishing the resulting land areas associated with future intensification. The Kerr Street grade separation involves a realignment of Kerr Street that includes a shift in the horizontal alignment of Kerr Street to the west starting approximately half way between Speers Road and Shepherd Road and extending north beneath the CN Rail corridor where it rejoins the existing alignment of Kerr approximately half way between the CN Rail corridor and Wycroft Road. The effect of this Kerr Street grade separation is a reduction in the developable lands on a portion of the existing Subject Site.

The assessment also takes in to consideration the planned improvements to Speers Road within the study area as set out in the Environmental Study Report completed by Delcan in September 2009. Based upon the evaluation of the alternative solutions, the preferred planning solution for the Speers Road corridor was identified as follows: *Increase traffic capacity along Speers Road through the addition of through / turn lanes and help alleviate congestion through the accommodation of transit users, cyclists, and pedestrians and the implementation of non-structural improvements including better signage and traffic control.* In the subject study area, the effect of this preferred solution involved a shift of the north curb line of Speers Road to the north to accommodate the increased width of curb-to-curb dimension and the introduction of bicycle lanes along Speers Road, an eastbound right turn lane as well as dual southbound left turn lanes and a dedicated southbound right turn lane, and, bicycle lanes on Kerr Street, north of Speers Road.

The Draft OPA and associated intensification levels also take into account the introduction of the new public and private streets across the Subject Site as well as the introduction of a public park and public square within the Subject Site.

Shepherd Road is to be extended west of Kerr Street to a point where it would connect with the northerly extension of St. Augustine Drive. The resulting public street would be a continuous public street with signalized connections at Kerr Street and at Speers Road.

The public park is planned to be centrally located within the Subject Site and be 1 acre (4.037 square metres) in area. A public square is planned to be located at the northwest corner of Speers Road and Kerr Street.

A private street is planned to wrap around the public park on its east and south sides creating an opportunity to provide access to development parcels that would front onto Speers Road and Kerr Street and offer an opportunity for mid-block pedestrian connections between Speers Road and Kerr Street and the planned street network within the Subject Site. The planned park and the private street can be configured in such a way to support a phased introduction of both, in response to the timing of development on the 171 Speers Road lands. This ensures that the lands that front onto Kerr Street could proceed with development and support the mobility and functional design needs of development on those properties independent of the potential for intensification on the 171 Speers lands. This arrangement forms the “Ultimate” scenario in the assessment of the operational conditions along public streets within the Study Area as assessed in **Section 8.0** of this report.

A second scenario is also assessed in Section 8.0 of this report; it is referred to as the “Interim” scenario. This scenario assumes that the 171 Speers Road property does NOT redevelop. As a consequence, the north-south segment of the private street described above would be initially connected to Speers Road at a right-in/right-out unsignalized intersection offering a phased introduction of a street network that can respond to the collective needs of development (from both accessibility and circulation perspectives), prior to the 171 Speers Road property being redeveloped. The park configuration would be altered to achieve a larger park area during the Interim scenario.

These public and private streets and public park and squares are illustrated on the Schedules to the Draft OPA as resubmitted in May 2022.

This revised report is an update to the Part 2, February 2022 TIS of the complete set of transportation assessments that will provide support for the Comprehensive development Plan and Draft OPA provisions. The Part 1 report, submitted to the Town of Oakville in November of 2021, was a high-level overview of the transportation considerations relevant to the Subject Site. This revised Part 2 May 2022 TIS report of the transportation assessment goes on to consider the implications of the associated intensification of the Subject Site in detail and provide an analytical assessment of the travel demands, impacts, and mitigation measures, if any, required to support the Draft OPA provisions. It also addresses preliminary comments from the Town of Oakville staff and the implications of the Metrolinx deferral of the Kerr Street Underpass project per comments from Town of Oakville staff.

The following sections of the revised Part 2 May 2022 Transportation Assessment report incorporate the Part 1 sections for context and add sections that address the analytical assessment of traffic operations associated with the introduction of the Upper Kerr Village intensification outlined in the Draft OPA provisions and the review of the Metrolinx deferral of the Kerr Street Underpass project. The Part 2 May 2022 TIS report presents a summary of the following:

- A description of the Existing Site, Surrounding Area and Development Proposal;



- Area Transportation Context;
- Relevant Policies of Key Planning Documents;
- Transportation Justification for Intensification within the Upper Kerr Village Area;
- A review of the Draft OPA development characteristics from various Frames of Reference – the Site, Site Phasing, the Local Area, and Regional Level;
- A summary of the analysis parameters adopted herein;
- A summary of the public street network capacity analyses,
- Review of the Implications of the Metrolinx Deferral of the Kerr Street Underpass Project; and,
- Summary and Conclusions



2.0 SITE AND DEVELOPMENT PROPOSAL CONTEXT

2.1 EXISTING SITE

The Existing Subject Site currently exhibits a range of retail / entertainment uses across the existing properties. The 171 Speers Road property includes an existing cinema use and what was a mixture of retail businesses, personal service businesses and institutional uses (adult learning centre). The balance of the Subject Site, that portion that fronts onto Kerr Street and a portion of Speers Road, operates like a homogeneous retail plaza with what is configured as retail gross floor area (GFA) situated along the west side of the Subject Site, service areas on the west side of the retail GFA and a conventional shared parking area between the retail GFA and Kerr Street.

In total the existing GFA associated with each of the properties include:

- The 171 Speers Road property is approximately 4,700 square metres (50,600 square feet) of GFA.
- 131 Speers and 530 Kerr, 550 Kerr and 588 Kerr has approximately 11,724 square metres (126,200 square feet) of GFA.
- The total existing commercial GFA across the Subject Site is approximately 16,424 square metres (176,800 square feet) of GFA.

The existing 171 Speers Road property acts as a separate parcel in terms of vehicular access and circulation. The balance of the Subject Site (including 131 Speers and 530 Kerr, 550 Kerr and 588 Kerr) acts as a contiguous parcel of land with two (2) access driveways from Speers Road and two (2) access driveways from Kerr Street. None of the existing access driveways are signalized.

The lands inclusive of 131 Speers and 530 Kerr, 550 Kerr and 588 Kerr have mutual cross-easements on title of each individual property that afford each parcel equal rights of access and circulation. The easements are mutually binding and all property owners must agree to any modifications to the easements. This effectively ensures that there will always be the ability to navigate across each property and use any access point to access or egress any parcel of land within this portion of the Subject Site.

The approved grade separation of Kerr Street and the CN Rail corridor will have the effect of shifting the horizontal alignment of Kerr Street to the west starting approximately half way between Speers Road and Shepherd Road and extending north beneath the CN Rail corridor where it rejoins the existing alignment of Kerr approximately half way between the CN Rail corridor and Wycroft Road. This realignment will reduce the future developable lands on a portion of the Subject Site and eliminate approximately 4,350 square feet of GFA (an existing outparcel building at the north end of the Subject Site). It will also reconfigure access to the Subject Site (the portion including 131 Speers and 530 Kerr, 550 Kerr and 588 Kerr) in such a way that the existing northerly unsignalized access driveway would be eliminated and replaced with a signalized access opposite Shepherd Road. The reconfigured access will also result in a reconfiguration of the parking layout and circulation around the new signalized access given the grading required to match the new (lower) elevations along Kerr Street post grade-separation. **Appendix E** contains the 30% design plans for the Kerr Street Grade Separation Proposed Road Improvements.

The grade-separation also results in a reconfiguration of the property boundaries along Kerr Street, especially for lands associated with 550 Kerr and 588 Kerr.



Service vehicle access to the rear of the retail GFA on the lands associated with 131 Speers and 530 Kerr, 550 Kerr and 588 Kerr would not be affected by the Kerr Street realignment.

The planned Speers Road improvements identified in the Speers Road Environmental Study Report would impact the 131 Speers Road property with the planned widening to accommodate the bicycle lanes and the introduction of the eastbound right turn lane on Speers Road at Kerr Street. Minor impacts to the south side of the existing Speers Road would also occur as a result of the planned full widening of Speers Road in this area.

2.2 SURROUNDING AREA

Generally speaking, the Subject Site is bounded by the following land use areas:

- to the **west** by Employment Area lands,
- to the **south** by Residential Area lands (generally single detached housing),
- on the **immediate south side of Speers Road, west of Kerr Street** by Main Street and Urban Centre lands,
- to the **east of Kerr Street** by Urban Core, Urban Centre and Main Street lands within the Upper Kerr Village area,
- to the **south, east of Kerr Street** and along the south side of Speers Road High Density lands and further to the south Residential Areas (generally single detached housing forms),
- to the **north** by the CN Rail corridor and Employment Areas further north,
- to the **northeast** by Natural Heritage System lands, and,
- lastly, to the **east beyond the Upper Kerr Village Growth Area**, by the Midtown Growth Area and the Oakville GO Station.

This is illustrated within the aerial photography presented in **Figure 1**.

From a mobility perspective, the surrounding areas offer a diverse set of destinations and relationships that would support intensification within the Subject Site:

- Employment areas offer opportunities to reduce the distance between home and work trips,
- Residential and main street uses offer mid-day destinations for residential land uses;
- Institutional uses within the residential areas offer school and local activity trips within convenience walking and cycling distances;
- Natural Heritage Systems offer recreational opportunities;
- Midtown Oakville offers both destinations unto itself for residents of the Subject Site, but more importantly it is a mobility hub; the Midtown Oakville area is a Major Transit Station Area (MTSA) offering a transit hub for both local and regional transit services.

The Subject Site is conveniently located proximate to the Queen Elizabeth Way (QEW) / Highway 403 corridor, linking the Upper Kerr Village Growth Area with destinations east (the Greater Toronto Area) and west (Greater Hamilton Area) of Oakville.





FIGURE 1: SITE CONTEXT PLAN – UPPER KERR VILLAGE SUBJECT SITE

2.3 DRAFT OPA AND COMPREHENSIVE DEVELOPMENT PLAN

As noted in **Table 1** above, the Draft OPA for the Subject Site will permit approximately 192,000 square metres of total GFA. This breaks down into approximately 171,300 square metres of residential GFA and 7,915 square metres of retail GFA, having taken into consideration floor area associated with above grade parking allowances. Net Floor Area (NFI) within the Draft OPA is 163,150 square metres or approximately 3.4 FSI. The Draft OPA as resubmitted in May 2022 for the Subject Site considered herein reflects input from the Town of Oakville staff and the general public relative to the November Draft OPA which formed the subject of the February 2022 TIS. This input has resulted in a shifting of the density (height of buildings) permitted in the Draft OPA across the Site to achieve a more desired urban design and set of planning related objectives. This is outlined in more detail in the supporting revised urban design brief prepared by Urban Strategies Inc. (USI).

For the purposes of the transportation assessment this translates into approximately 1,842 residential units. The Livable Oakville policies strongly recommend that a grocery store be retained within the Subject Site as the lands are redeveloped. The Comprehensive Development Plan for the Subject Site as contemplated within the Draft OPA makes provision for the retention of key retail uses towards the Speers Road/Kerr Street intersection. This would place the retail GFA strategically near transit services and the surrounding communities. The urban structure of the Draft OPA also allows for appropriate accessibility to such uses both from an Active Transportation perspective (pedestrian and cycling accessibility both from within the Subject Site but also from the adjacent Kerr Street and Speers Road frontages) and from a service vehicle perspective – providing important support for the retail viability.

The Draft OPA also includes important policies relevant to Streets and Parking in Section 1e. Subsections i., ii, and iv address the public street extensions of Shepherd and St. Augustine Drive, introduction of a private local street within the Subject Site, and the ability to park vehicles below-grade beneath the proposed public park and private street, respectively. These are addressed in more detail below.

The structure of the mobility elements of the Subject Site includes important internal and external linkages for all modes which are consistent with the Livable Oakville Policies and guidance contained in the supporting transportation (Kerr Village Transportation Assessment, 2009) and planning (The Plan for Kerr Village, 2009) documents originally conducted in support of intensification of Kerr Village.

The extension of Shepherd Road and St. Augustine Drive into the Subject Site provides strategic accessibility for both motor vehicles (private auto, service vehicle and emergency vehicles) and for pedestrian and cycling modes also. It also offers additional network flexibility (alternative connections to both Kerr Street and to Speers Road) to ensure that existing traffic patterns in the area are not unduly burdened by the planned intensification. The introduction of a private street within the Subject Site ensures that accessibility to resulting development parcels fronting along Kerr Street and along Speers Road can be accessed within introducing unnecessary driveway connections to the arterial streets.

The private street proposed internally to the Subject Site also serves to frame the public park proposed centrally located within the Subject Site.



The Draft OPA permits the ability to construct beneath the private street and the public park to provide flexibility when designing the Site Plans associated with individual development parcels. This will have the effect of providing the following benefits to the proposed intensification:

- **Public Easements** would be granted in favour of the Town of Oakville permitting the use of the private Local Street by the general motoring public. The private street would “appear” (at-grade) to be public given they would be designed to surface public street standards having appropriate operating design criteria (i.e., design and posted speeds and corresponding horizontal and vertical design criteria). Easements would also obligate the owners of the Private Streets to maintain them to a minimum standard that would equal public ownership conditions to ensure they retain their intended role in the overall Draft OPA street network;
- The Private Street ownership better facilitates the ability to **locate parking beneath the Private Local Street** ROW. There is significantly less complexity in the strata ownership arrangements that result from Private ownership. Similarly, the liability associated with the ability to locate parking beneath a Private Street is more manageable relative to the same arrangements beneath a Public Street;
- Being able to park beneath the private Local Street will enable a **more efficient and more cost effective below-grade parking garage layout** for development blocks, benefitting the overall costs associated with the developments;
- A Private Local Street will **better facilitate potential below-grade pedestrian and service connections** within the individual developments.
- **Phasing of development** can be more flexible given the planned introduction of the public park and the uncertainty associated with the timing of the 171 Speers Road property and the now deferral of the Kerr Street Underpass project by Metrolinx.
 - The private street could be initially connected to Speers Road offering a phased introduction of a street network that can respond to the collective needs of development (from both accessibility and circulation perspectives), prior to the 171 Speers Road property being redeveloped and in response to the deferral of the Kerr Street Underpass project by Metrolinx (however, there are corollary limiting factors as a result – see **Section 10.0** here for more detail).
 - Implementing segments of the Private Street – given an overall street network plan to work towards – would be more efficiently and cost effectively undertaken given flexibility of the private Local Street.
 - Ability to provide effective Emergency Vehicle access under early phases of development to meet the requirements of the Ontario Building Code and the requirements of the Emergency Services of the Town of Oakville (Fire Services) and the Region of Halton (Ambulance/Paramedic Services).
- **Cost effectiveness for the Municipality** – Long term maintenance of the Private Street would lessen the financial obligations of the Municipality and link them to the planned development;



- Private Local Street designation would **permit a more flexible design and construction of key civil and structural elements associated with the ROW** while maintaining appropriate engineering and urban design requirements; and,
- The private Local Street could also facilitate a **more flexible and higher standard of urban design and maintenance program to be implemented** along the Private Street ROW.

The combination of the public and private street network will also provide flexibility for individual development parcels to locate and coordinate placement of driveway accesses to parking garage elements (above or below grade), to service vehicle areas and to ensure emergency vehicle access is appropriately provided. The design of the public and private street rights-of-way at 20 metres and 18 metres, respectively, will facilitate on-street parking strategically located relative to intersections, driveways and building and park frontages.

Subsection iii of the Draft OPA addresses vehicular parking. A reduced parking ratio should be encouraged to support Provincial, Regional and Municipal policy objectives for increasing transit use and active transportation in Kerr Village, supporting intensification within the Growth Area, achieving environmental objectives and benefits, and supporting area transportation infrastructure investment. Reduced parking ratios will be established at the development application stage.

Reducing vehicular parking standards within the Upper Kerr Village area is a fundamental element of the Transportation Demand Management (TDM) measures that would be considered along with any development application within the Subject Site. It also goes hand in hand with the inclusion of such TDM measures as Car Share facilities and memberships, the concept of bike share facilities (whether public or privately implemented), enhanced cycling infrastructure on-site, enhanced connections between development and the public realm (walkways and pathways provide as direct a connection to public transit facilities and public sidewalks and cycling infrastructure as possible/practical), pick-up and drop-off facilities to support shared ride services (Uber and Lyft, etc.) and parcel delivery, and transit pass incentives.

Justification of parking reductions should be assessed at the Zoning development application stage and evaluated within the context of the supporting infrastructure, programs, and facilities that encourage non-auto travel modes, lower vehicular ownership patterns and support mobility infrastructure investment in the area.

3.0 AREA TRANSPORTATION CONTEXT

3.1 PUBLIC STREET NETWORK

The existing area public street network context is illustrated in **Figure 1**. **Figure 2** illustrates the existing lane configurations and traffic control within the study area assessed. **Figure 3** illustrates the planned lane configurations and traffic control within the study area based upon 2009 Kerr Village Transportation Assessment, the 2009 Speers Road Environmental Study Report, the Kerr Street Grade Separation Proposed Road Improvements and the proposed Draft OPA provisions.

A summary of the existing and planned street network follows:

- Both Speers Road and Kerr Street are Town of Oakville streets and both are 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.
- 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 Upper Kerr Village area were identified for implementation in conjunction with development (intensification) and regional rail service upgrades within the Kerr Village Growth Area:
 - Kerr Street - given the grade separation planned for Kerr Street, Kerr will have two through lanes in each direction plus left & right turn lanes at a new signalized intersection at Shepherd;
 - 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;
 - Speers Road was identified as requiring an eastbound right turn lane in addition to the current lane configurations; and,
 - Speers Road was identified as requiring bicycle lanes along its length –to east of Kerr Street.
- 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)

These improvements and designations were identified within the context of the planned intensification associated with the overall Kerr Village Growth Area. **Appendix D** illustrates the recommended public street improvements (Figure 5.6) per the 2009 Kerr Village Transportation Assessment conducted by Urban & Environmental Management Inc. on behalf of the Town of Oakville as well as the Preferred Design (Morden Road to Speers Road) from the 2009 Speers Road Environmental Study Report. **Appendix E** contains the 30% design plans for the Kerr Street Grade Separation Proposed Road Improvements.

The introduction of the Shepherd Road and St. Augustine Drive extensions – referred to earlier – will augment the existing public street system by linking Kerr Street and Speers Road and offering both intensification related vehicular traffic as well existing corridor related traffic volumes relief from existing busy junctions in the immediate area.

3.2 PUBLIC TRANSIT NETWORK

The existing public transit system within the vicinity of the Upper Kerr Village is illustrated in **Appendix F**.

Existing routes passing directly by the Subject Site include the following Oakville Transit routes:

- Route 4 – Speers – Cornwall – with 30 Minutes headways during peak periods
- Route 14 and 14A – Lakeshore West – each has 30 minute and 50 minute headways individually, combined they have the effect of 15 minute headways between the Subject Site and the Oakville GO stations during peak periods
- Route 15 – Bridge - with 30 Minutes headways during peak periods\
- Route 18 – Glen Abbey South – with 30 Minutes headways during peak periods
- Route 28 – Glen Abbey North – with 30 Minutes headways during peak periods
- Route 10 West Industrial – 30 Minutes headways during peak periods only

The Subject Site is in the enviable position of being at the convergence of 5 Oakville Transit routes that all lead to the Oakville GO Station. 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 900+/- m 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.

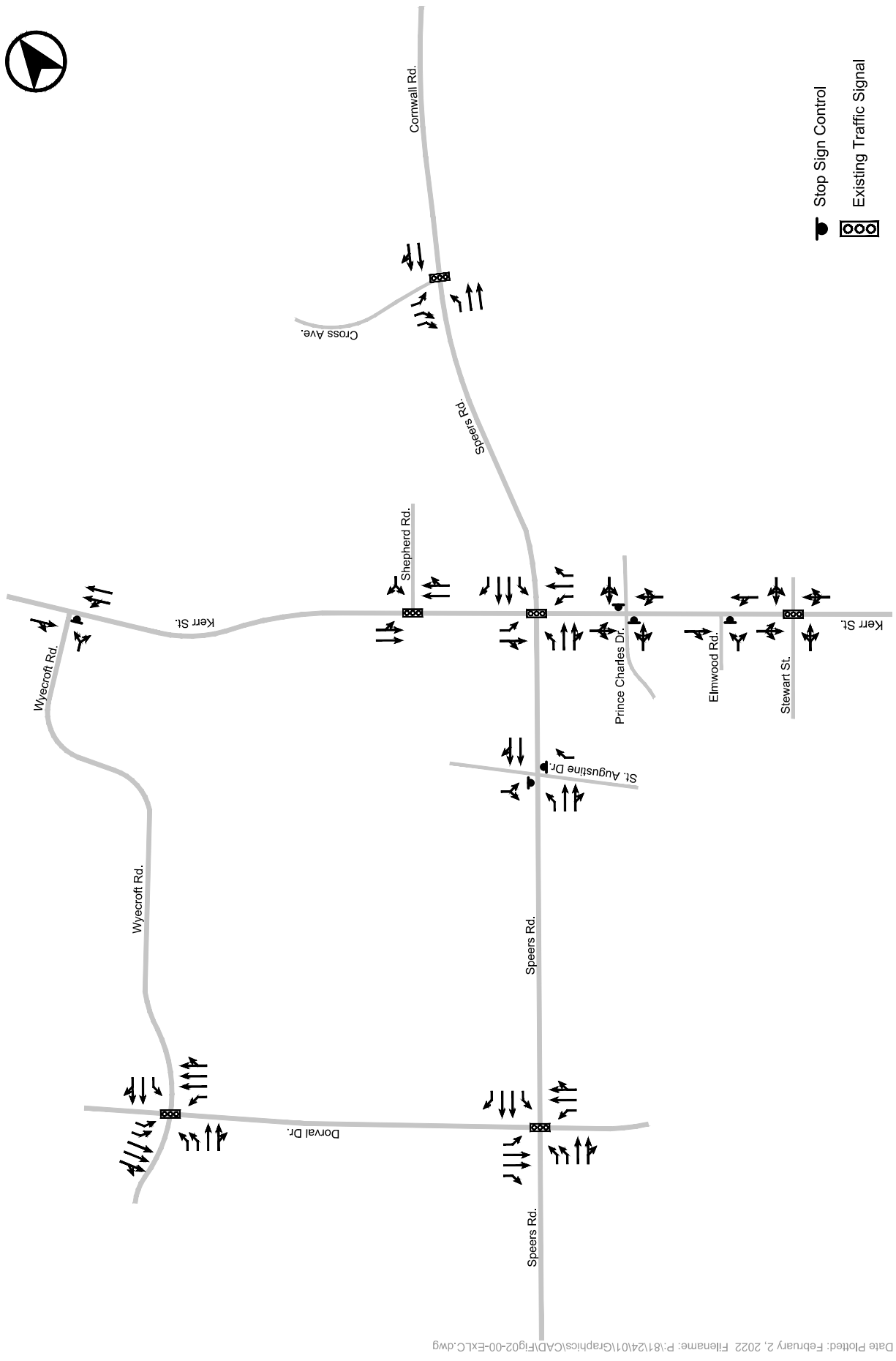
Existing transit stops are located on either side of Kerr Street at Shepherd Road, on the south side of Speers Road at Kerr Street, and the north side of Speers Road approximately 100m west of Kerr Street. The Kerr Street grade separation includes an improvement to the west side bus stop at Shepherd Road. Staff have indicated that the north side bus stop on Speers Road should be located further west to the future intersection of St. Augustine Drive. Furthermore, Oakville Transit staff advise that real estate should be reserved for transit stop and passenger amenities at these locations.

In addition to regular Oakville Transit conventional transit service, an accessible transit service called care-A-van provides door-to-door transportation for persons with disabilities. Anyone unable to use conventional transit service due to their disability is eligible to apply. The service operates within Oakville Transit's operation hours and is available 7 days a week.

Also offered in Oakville is the “on-Demand” transit service generally suited to areas where regular transit service is not the most efficient means of providing public transit service. Given the nature of On-Demand transit, and the concentrated ‘origins’ that an intensified Upper Kerr Village area will offer, On-Demand transit could link Upper Kerr with other “concentrated” destinations within the Town that could serve as a supplemental transit option for residents.

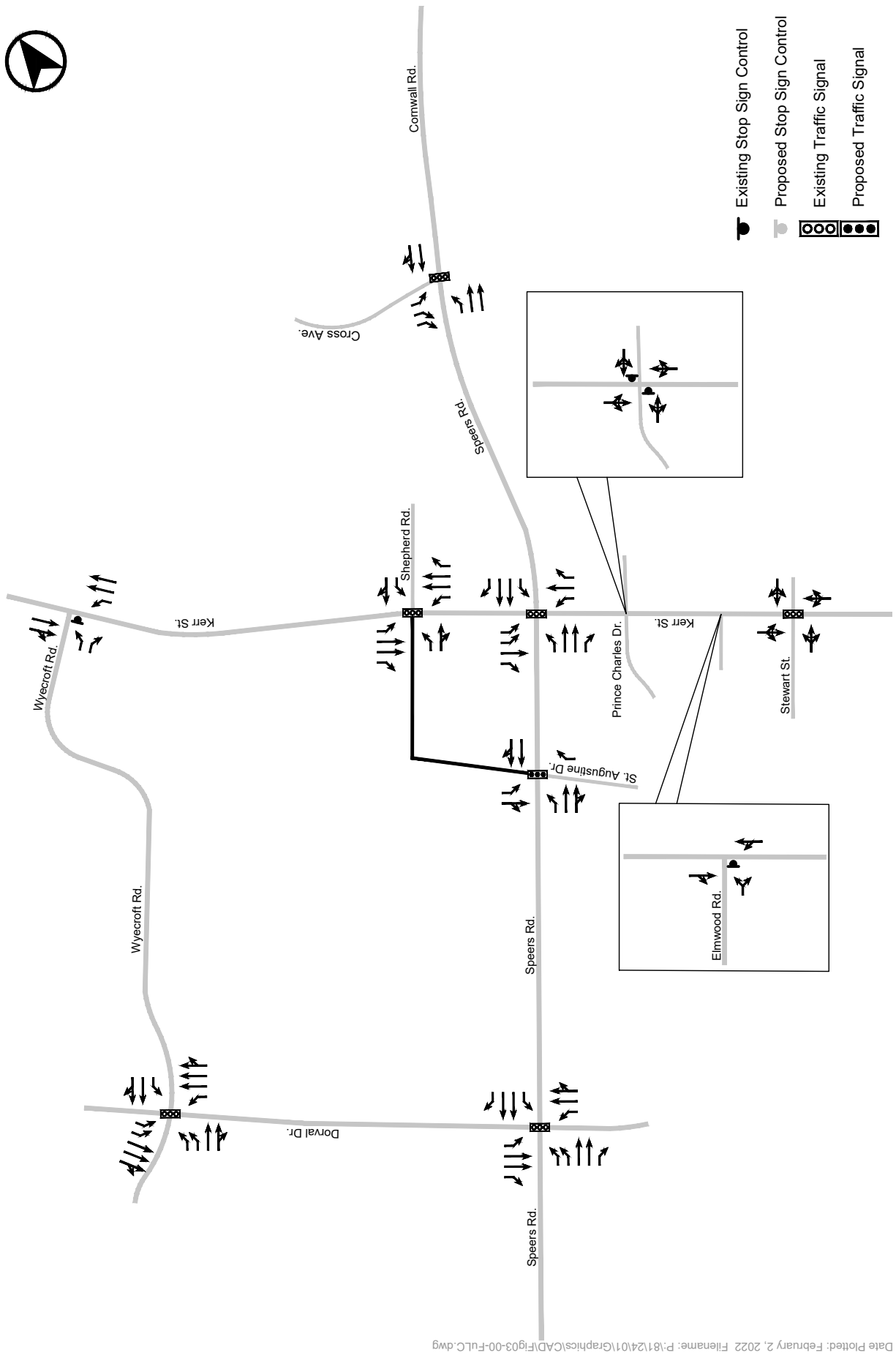
The Kerr Village Transportation Assessment (2009) and The Plan for Kerr Village (2009) both acknowledge that existing public transit and future enhanced public transit will play a significant role in meeting the travel needs of Kerr Village based upon the planned intensification.

As part of the Transportation Demand Management plans that will form part of the mobility strategy for development within Upper Kerr Village, enhanced connections between the development within Upper Kerr Village and the public street frontages should be mandated to provide high quality, convenient and safe pedestrian and cycling connections to public transit stops and municipal cycling facilities.



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FIGURE 2 EXISTING LANE CONFIGURATION AND TRAFFIC CONTROL



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FIGURE 3 PLANNED LANE CONFIGURATION AND TRAFFIC CONTROL

3.3 ACTIVE TRANSPORTATION NETWORK

Appendix G presents the Existing, Previously Proposed and Candidate Pedestrians and Cycling Routes within the Town of Oakville.

All public streets bordering the Subject Site have sidewalks provided on both sides of the streets. Where newer development (NE corner of Speers and Kerr) has already occurred improved pedestrian facilities have been implemented.

There are presently no existing dedicated cycling facilities along either Speers or Kerr corridors.

Both Speers (buffered Bike Lanes) and Kerr (Bike Lanes from Speers to the north) and Shepherd Road (Bike Lanes to the south) are identified to have dedicated cycling facilities along their lengths. Kerr Street is planned to have “super sharrows” from Speers Road to Lakeshore Road.

These facilities will offer connections through the Town and to key daily destinations. These types of facilities assist in providing the “first mile / last mile” facilities that support and encourage non-auto modes of travel for commuting and for daily trip making. This is especially true when a MTSA (Oakville GO Station) is situated some 900+ metres to the east and employment and community retail areas are approximately 1.5 km to the west and northwest, resulting in a cycling trips that is less than 5 minutes and between 5 and 10 minutes, respectively.

4.0 RELEVANT PLANNING DOCUMENTS

4.1 PROVINCIAL PLANNING DOCUMENTS

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, through policies in Section 3.2.2, 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.

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

4.2.1 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 that speak directly to 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 prepared by Urban Strategies Inc.

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.

Policy 23.6.2 states that:

Land Use policies

The maintenance of a food store in any redevelopment of lands within the Urban Core designation shall be encouraged.

Policy 23.8.1 states that:

Implementation Policies

Phasing / Transition

a) Development will likely occur gradually over the long-term and be co-ordinated with the provision of infrastructure, including:

- i) transit;
- ii) transportation improvements;
- v) pedestrian and cycling facilities;

4.3 RELEVANT TECHNICAL / PLANNING DOCUMENTS

4.3.1 Kerr Village Transportation Assessment (2009)

This technical document prepared by Urban & Environmental Management (UEM) provided the basis of the transportation support for the proposed development intensities found within *The Plan for Kerr Village (2009)*, the planning document that describes the selected development scenario for Kerr Village and the Upper Kerr Village component.

The purpose of the assessment was to evaluate the ability of the Town's Capital Forecast Program, the 5 Year Transit Service Plan and other studies that recommend infrastructure improvements for Kerr Village to determine the opportunities and constraints of achieving the three growth scenarios developed by Planning staff.

The Transportation Assessment was different from the other Traffic Study in its approach in defining

residential and commercial/retail/office uses allowing for more specific trip generation and assignment analysis. In addition, the assessment gave greater allowance in forecasting longer-term modal shares within the Village and evaluating critical road network improvements for automobile use and transit. The analysis was based on accommodating a development cap of approximately 2,100 new residential units and 24,000 square metres of commercial/retail/office space. The assessment concluded with recommendations regarding infrastructure improvements, suggested alternatives to mitigate impacts, corridor/EA studies, and what changes in travel mode patterns would be required to defer infrastructure improvements.

Approximately 78% of the planned residential intensification (approximately 1,765 units of a total of 2,265 units) was targeted for the Upper Kerr Village portion of Kerr Village. The 2009 Transportation Assessment also accounted for approximately 24,100 square metres of commercial leasable area within the Upper Kerr Village area.

Of note, relative to the intensification accounted for within the 2009 Transportation Assessment, the Draft OPA would result in an additional approximately 940 residential units and a reduction of some 13,700 square metres of commercial leasable area within the Upper Kerr Village area.

As noted in the Introduction of this report, the current Draft OPA transportation assessment considers the implications the intensification, as permitted in the current Draft OPA within the Subject Site, and provides an analytical assessment of the travel demands, impacts, and mitigation measures, if any, required to support the current Draft OPA provisions.

4.3.2 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.

Based upon stakeholder input, planning principles and technical analyses, a development scenario was established that included the following parameters:

- Existing development levels (2009) – 2,600 residential units and 19,900 square metres of commercial space
- Approved but not yet built development (2009) – 352 residential units and 417 square metres of commercial development;

- Proposed New (additional) Development (from 2009) – 2,100 residential units and 24,000 square metres of commercial development;
- With Bonusing (additional) New Unit threshold (from 2009) - 2,300 residential units

This development intensification was supported by the 2009 Transportation Assessment and its recommended transportation improvements/conditions.

5.0 HIGH-LEVEL JUSTIFICATION FOR INTENSIFICATION WITHIN UPPER KERR VILLAGE

The Upper Kerr Village is an excellent location to support intensification within the Town of Oakville. The following high-level bullet points summarize the key rationale for the proposed Draft OPA development levels:

- **Upper Kerr Village is a designated secondary Growth Area within the Town of Oakville** – mandate is to promote their development as mixed use centres with viable main streets. Livable Oakville notes that Kerr Village has been the subject of detailed, comprehensive land use studies which have resulted in objectives and policies to provide for growth opportunities.
- **Substantial Municipal/Regional/Provincial mobility infrastructure investment within general vicinity of Upper Kerr Village and within nearby Mid-Town**
 - Speers Road and Kerr Street public street network improvements – substantially improved multi-modal connectivity;
 - Municipal investments along Speers Road/Cornwall corridors and in near-by Mid-Town (Trafalgar BRT corridor) – establishing foundational network elements of higher order transit systems
 - Trafalgar Road - identified as Transit Priority Corridor –Mid-town to Georgetown;
 - Speers Road 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)
 - Provincial (Metrolinx) investment in Mid-Town referred to as an Anchor Hub or Mobility Hub providing a nearby enhanced Transit Hub:
 - Regional Express Rail (RER) service / Regional Rail service;
 - GO Bus service;
 - Integration with Local Oakville Transit (Mid-Town is the busiest Transit Hub in Oakville)
- **Proximity of Upper Kerr Village to existing and planned multi-modal infrastructure**
 - Upper Kerr Village’s compact area and supporting (existing and proposed) public street network provides a dense, urban street grid well suited for both pedestrian and cycling modes of travel.
 - This proposed street grid will facilitate mobility and will prioritize non-auto travel within the area;
 - The mixed-use “complete community” within the Upper Kerr Village is an excellent basis for intensification serving day-to-day needs of residents, employees, visitors, and commuters.
 - Internalization /efficiency of trip making is maximized.
- **Intensifying the residential population of Upper Kerr Village will increase and encourage non-auto trip making for commuters and internalized O-D trips.**
 - The level of transit service serving trips destined TO and through Upper Kerr Village from elsewhere in the Town of Oakville serves as an excellent “built-in” contra-flow transit capacity for trips FROM and through Upper Kerr Village to other areas of the Town. No additional transit capacity is required to deliver this contra-flow capacity.

- Existing 'On-demand' transit services could be further enhanced given the concentrated "origins" within Upper Kerr Village when paired with "popular destinations" in the Town of Oakville.
- Micro-mobility provides an excellent option to exploit short-travel distances within Upper Kerr Village, the balance of Kerr Village and Mid-Town.
- **Upper Kerr Village is an Excellent location to incorporate Reduced Vehicular Parking Rates to reduce auto-based travel:**
 - Consistent with Provincial, Regional, and Municipal mobility policies and investments;
 - One of the best Transportation Demand Management (TDM) tools to implement;
 - Reduces overall project costs for initial construction and on-going life-cycle costs of housing ownership; and,
 - Excellent opportunity to incorporate Car Sharing/Bike Sharing and micro-mobility as a mobility alternative.

6.0 REVIEW OF DRAFT OPA DEVELOPMENT CONTEXT

A review of the Draft OPA development potential within the context of the proposed Comprehensive Development Plan and the relevant sections of policy and planning documents identified above is provided below. The review is carried out within four different perspectives or frames of reference; from the “Site Plan” scale, from a “Phasing” perspective, from the “Local Area” perspective, and from the “Regional” perspective.

The Draft OPA seeks to further intensify the Subject Site with higher density forms and building heights within the Upper Kerr Village District (requiring an Official Plan Amendment), incorporating non-residential land uses that are currently encouraged by the Livable Oakville document and existing Official Plan designations.

6.1 “SITE PLAN” SCALE PERSPECTIVE

At the “Site Plan” scale, the Draft OPA policies and its schedules permit flexibility to achieve development options within the Comprehensive Development Plan.

6.1.1 Pedestrian and Cycling Accessibility

Accessibility for pedestrian and cycling (active transportation) modes will be afforded significant flexibility to approach and depart the various development parcels and navigate within the Upper Kerr Village District. Short block lengths and mid-block connections (see Schedule D of the Draft OPA resubmitted in May 2022) to travel between development parcels will ensure that active transportation modes are supported and encouraged at this scale. Pedestrian facilities will be provided on both sides of all streets (public and private) within the ROW’s planned (20 m ROW for the Public Street and 18 m ROW for the Private Street).

Cycling facilities will occur within shared on-street lanes within the block. The proximity of the development parcels will require only short distances be travelled before reaching dedicated cycling facilities on the busier arterial streets that frame the Upper Kerr Village District.

Bicycle parking will be encouraged to exceed the minimum number of spaces (as part of comprehensive Transportation Demand Management plan measures) and be located in a secure weather protected location for resident or long-term bike parking spaces ideally at-grade, but also below or above grade with reasonable access opportunities (e.g., elevator access, use of an appropriately design vehicular ramp, stairs with bike rails) and at-grade in a convenient and safe (ideally weather sheltered) location for visitors or short term bike parking spaces.

6.1.2 Vehicular Parking / Loading / Access & Circulation, Emergency Vehicle Access

Vehicular access will occur from the aforementioned public and private streets. All development related vehicular access will occur from internal streets; no access will be permitted to development parcels from either Speers Road or from Kerr Street.

On-street parking is contemplated within the public and private streets, taking into consideration proximity to intersections, driveways and front door conditions associated with individual developments.

Urban design guidelines and technical analyses associated with vehicular access operations will refine the precise positions of vehicular driveways. This will take into account the provision of service vehicle access and egress as it relates to individual development parcels. Parcels with basic residential uses and a small amount of commercial floor space will likely be able to consolidate access for service vehicles and passenger vehicles (residents and visitors) while managing on-site vehicle manoeuvring so as not to negatively impact on-site circulation, the pedestrian boulevards and on-street cycling and vehicular activity and safety.

Development parcels with greater commercial concentrations will need to rationalize on-site operations more carefully to ensure manoeuvring operations are incorporated safely and efficiently. This will likely involve some form of enclosed or segregated service vehicle loading areas for both operational, visual and noise sensitivity reasons.

Vehicular parking will be situated primarily below-grade, but above-grade parking will also be permitted provided it is screened from external view. Parking will also be permitted to occur beneath the private street and the public park. The advantages to such provision are discussed in Section 2.3 above.

The parking supply ratios associated provided for individual development parcels will be permitted to be reduced, relative to the prevailing Town of Oakville Zoning Bylaw requirements, in order to support public transit and active transportation modes. The various locational and travel attributes associated with the Upper Kerr Village District are implicitly supportive of such reductions as are the various objectives and goals as set out in the Livable Oakville – Growth Plan Area – Kerr Village policies. Furthermore, with supportive TDM plan measures, reductions in parking would be further supported.

Emergency vehicle access and circulation is essential at all phases of development. The planned public and private street network, under all phases, will be capable of providing emergency vehicle access that meets or exceeds the Ontario Building Code requirements. Phased development across the lands east of the 171 Speers Road site would initially be accessed from the Shepherd Road extension and the private N-S street that would initially connect with Speers Road. This provides a continuous set of connections to all of the buildings within the initial phases of development. Subsequent phases of development involving 171 Speers Road would see the implementation of the St. Augustine extension, connecting to the Shepherd Road extension completing the public street network, while being augmented by the private street sections that would in turn connect to both legs of the public streets (Shepherd Road and St. Augustine extensions). The initial Private Street connection to Speers would be terminated in favour of active transportation connections to Speers Road corridor. The implications on Emergency vehicle access to development phasing in light of the Metrolinx Kerr Street Underpass deferral are addressed in **Section 9.0** of this revised TIS report.

6.1.3 Broader Mixed-Use Benefits

The Draft OPA policies will require a supportive amount of non-residential floor space within the District. These levels are will assist in offsetting some travel demand by internalizing trip-making and causing trips to be made by more efficient and less impactful travel modes; i.e., walking trips. By locating the commercial floor space towards the Speers and Kerr intersection, this will further reduce the walking and cycling distances for trips that are made from outside of the immediate Upper Kerr Village District boundaries.

Mixed use development will also provide for more efficient use (i.e., maximization) of on-site infrastructure including:

- Shared general amenity space for employees, residents, and visitors of individual parcels and the District in general;
- Shared parking supply between residential visitors and some commercial uses, particularly during evening and weekend periods;
- Vehicle servicing requirements – i.e., refuse collection, general delivery, and moving needs;
- Pedestrian facilities / connections to public rights-of-way and public transit facilities.

6.1.4 Transportation Demand Management (TDM) Programs and Measures

The location of the Site and surrounding land uses greatly influences the success of a mobility plan. The purpose of the Mobility Choice Travel Plan is to guide the provision of viable alternative personal transportation options beyond the single-occupant, private automobile. This plan intends to support the proposed development by outlining Transportation Demand Management (TDM) measures and the suite of strategies under consideration to promote the use of more active and sustainable transportation modes; respond to the mobility needs of residents, employees and patrons to the Site; and to reduce the overall dependence on the private automobile.

The existing and future Site context provides for frequent public transit services along with planned cyclist and pedestrian connectivity. While strong opportunities exist in the area infrastructure to accommodate sustainable transportation practices, the ability to fully leverage these opportunities is granted by the success of the implementation of the Mobility Plan.

Four specific objectives define the policy framework for the Mobility Choice Travel Plan:

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

A detailed Mobility Choice Travel Plan will be developed and secured through the development approvals for individual development parcels in consultation with the Town of Oakville.

6.1.4.1 Organizational Framework

The four broader objectives can be organized within the following categories:



- Encourage Transit Use;
- Encourage and Facilitate Bicycle Use;
- Enhance Pedestrian Access and Walkability;
- Facilitation of Reduced Car Ownership and Usage;
- Vehicular Parking Supply and Management;
- Land Use and Building Infrastructure; and
- Coordination, Communication and Promotion.



Measures from the Mobility Choice Travel Plan would be incorporated into individual development applications to minimize the need to own a personal vehicle or use an automobile when travelling to and from




the District. It is important to encourage and facilitate the use of non-automobile travel modes on a daily basis.

A summary of the Mobility Choice Travel Plan Strategies are discussed in **Table 2**. Further refinement of the TDM Plan would occur at the individual development application stage of the development review process. The key elements of the TDM plan are consistent with or provide what is set out in Livable Oakville and the Draft OPA.

TABLE 2 POTENTIAL MOBILITY TRAVEL PLAN STRATEGIES

LAND USE INTEGRATION		<p>Intent: A mixed-use development and surrounding area provides uses that allow people to meet a variety of their daily needs on and close to the Site. These locally accessible land uses provide a level of convenience and mobility choices that reduces the need to travel by private automobile.</p>	<p>Implementation:</p> <ul style="list-style-type: none"> • To the extent possible, mixed use developments should maximize the non-residential floor space within the development applications. • There are a variety of retail, employment, entertainment, institutional, and recreational opportunities within the surrounding area.
TRANSIT USE		<p>Intent: Support for and the promotion of the use of area transit services for both short and long-distance travel by residents, visitors and employees will reduce the overall use of a vehicle and the need to own one.</p>	<p>Implementation:</p> <ul style="list-style-type: none"> • The Site is within 900+ metres of the Oakville GO Station; • The Site is within immediate proximity of five (6) existing Oakville transit routes; • The Site is immediately adjacent to Oakville Transit bus stops that service the surface routes that run along Speers Road and Kerr Street. • Consideration should be given to providing each new dwelling unit with a pre-paid PRESTO card for use on both Oakville Transit and GO Transit services. • Existing On-Demand Transit Services should be considered as a routine extension to the fixed transit routes for this intensification area to serve key O-D relationships within the Town of Oakville to further reduce the reliance on the private automobile for daily trip making. • Consider density Bonusing/CBC may be considered in exchange for transit benefits – discussions would be ratified through development application process and discussions with Town of Oakville staff.

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">BICYCLE FACILITIES</p>		<p>Intent: Provide cycling infrastructure that supports and promotes cycling as a convenient and viable travel alternative to the personal automobile.</p>	<p>Implementation:</p> <ul style="list-style-type: none"> • The Site will be located in proximity to a future bike lanes along Speers Road (dedicated buffered bike lanes) and along Kerr Street (bike lanes) and Shepherd Road (bike lanes). • Bike parking should exceed minimum requirements as part of a comprehensive TDM multi-modal plan. • Consideration should be given to providing locally placed Bike Share stations (either through public or private arrangements) to further enhance the area cycling facilities for the District and the area in general. • Bike support facilities on-site – bike repair stations – should be considered for each development to further enhance the cycling infrastructure and encourage cycling activity on a daily basis. • Consider also E-bikes or E-scooters as alternative modes to be accommodated at individual developments.
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">PEDESTRIAN CONNECTIVITY</p>		<p>Intent: A high-quality connection between the Site and transit stops, cycling network, and public street system encourages residents, employees and visitors to travel around the Site area without a vehicle.</p>	<p>Implementation:</p> <ul style="list-style-type: none"> • The District gives residents, visitors and employees direct access from most development parcels and a very short walk/cycle from others to the adjacent arterial streets where transit services operate. • These connections should be enhanced to create a better walking / cycling experience. • As part of the development of individual development parcels, the public sidewalks along the public and private streets should reflect – at a minimum – the minimum Town of Oakville pedestrian clearway dimensions/design standards.

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">PARKING MANAGEMENT</p>		<p>Intent: Reduced parking standards within the District to encourage residents, visitors and employees to re-consider the use or ownership of a vehicle and encourage the use of public Transit and active transportation modes.</p>	<p>Implementation:</p> <ul style="list-style-type: none"> • Shared parking principles should be taken advantage of to the fullest extent within mixed-use developments. • Provide reduced resident and non-residential (i.e., shared visitor /retail) parking rates appropriate for the District circumstances – to be justified on a development application basis. • To the extent possible, consider charging for visitor or non-residential parking spaces. This should be evaluated on a development application basis relative to viability and off-site impacts.
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">CAR-SHARE</p>		<p>Intent: Car-share programs provide “on-demand” access to a fleet of vehicles located within the District’s vicinity. The convenience and easy access reduces the need to own a personal vehicle, and also encourages the use of other non-automobile commuting methods.</p>	<p>Implementation:</p> <ul style="list-style-type: none"> • Information should be provided to residents and employees related to the availability of area car-share options when purchasing a unit. • Consideration should be given to providing each dwelling with 2-year car share membership. • Provide Car-Share parking spaces (to be determined based upon individual applications) within the visitor portion of developments ideally at-grade but within the below-grade parking garage also is acceptable, to support Project mobility choices.
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">COORDINATION, COMMUNICATION, PROMOTION</p>		<p>Intent: Inform, raise awareness, and actively promote non-automobile travel options for the Site.</p>	<p>Implementation:</p> <ul style="list-style-type: none"> • An information package should be distributed to residents and employees of the Site at the time of occupancy, informing them of the variety of mobility choices available to them; highlighting the non-private automobile travel services available to the individual developments.

6.2 DEVELOPMENT PHASING PERSPECTIVE

6.2.1 Key Infrastructure Elements

The key to the development phasing is ensuring that the public (extension of Shepherd and St. Augustine) and private street infrastructure is delivered coincident with the individual development parcels that 1) rely upon its presence to facilitate access and egress and 2) facilitate its introduction to contribute towards the fulsome public and private street network as set out in the Draft OPA Schedules. This also includes the

public park (or portions thereof) planned as part of the District. This is also essential for the provision of Emergency Services accessibility at all phases of development.

6.2.2 Development Parcel Phasing Considerations

Given the integrated nature of the existing retail operations that are located across the combination of the 131 Speers and 530 Kerr property, the 550 Kerr property and the 588 Kerr property, phasing individual development applications will be a challenge.

Existing access and circulation easements in favour of all properties across all the aforementioned properties will require careful consideration of adjacent parcel access, circulation, and parking whenever a development application is brought forward.

Given the complexity of such phasing, it would be necessary for each individual development application to assess the relative needs of the subject development application and the needs of the adjacent parcels and provide a phasing plan that:

- 1) Demonstrates no adverse impact occurs on the continued operation of remaining existing uses;
- 2) Demonstrates how the subject development application can be realized without precluding the implementation of the overall development potential outlined in the Comprehensive Development Plan; and,
- 3) Demonstrates the manner in which infrastructure and parkland will be provided.

6.2.3 Phasing Implications Associated with 171 Speers Road

The 171 Speers Road development parcel is not a direct party to the Draft OPA process, but will nevertheless be integral in delivering the fulsome set of infrastructure necessary to achieve the Comprehensive Development Plan.

As such, the phased implementation of the public and private streets as well as the public park have been considered such that an interim arrangement could be achieved that permits those portions of the Upper Kerr Village district that are located on the 131 Speers and 530 Kerr property, the 550 Kerr property and the 588 Kerr property to move forward with development.

The north-south portion of the planned private street would be extended south to intersect with Speers Road. The east-west portion of the private street would be constructed as park space in the interim, thereby maximizing the available park space and providing a “looped” street (part public and part private) to facilitate pedestrian, cycling and vehicular and Emergency vehicle circulation.

At the time 171 Speers Road move forward with a development application, the balance of the public street (the north-south portion and a short section of the east-west portion) would be realized as would the east-west portion of the Private Street. This would also have the effect of completing the public park in the shape and size set out in the Draft OPA and completion of the private street. The segment of the private street from Speers Road to the east-west segment of the private street would be closed to vehicular traffic and accessibility would be dedicated to active transportation modes.

6.3 LOCAL AREA PERSPECTIVE

6.3.1 Preliminary Development Travel Characteristics

Assessment of the travel characteristics from an analytical perspective are assessed later in this report.

The analyses herein summarizes the recommended public street network configuration needed to support the Draft OPA level of intensification relative to the recommendations made in the 2009 Kerr Village Transportation Assessment and the 2009 Speers Road Environmental Study Report. The purpose of this exercise is to determine if any further or different set of transportation improvements are required to support the proposed Draft OPA levels of intensity. This assessment is found in **Section 9.0** of this report.

An assessment of the implications of the Metrolinx deferral of the Kerr Street Underpass project is assessed in **Section 9.0** of this report.

6.3.2 Public Accessibility – Connectivity to Public Transit, Bicycle and Pedestrian Networks

As noted in the Section 3.2 and 3.3 above as well as in Section 5.1, the level of accessibility afforded the Upper Kerr Village District by public transit and future cycling network elements, will be significant.

The District lies at the convergence of several Oakville Transit routes that ultimately are destined for the Oakville GO Station. This makes the District particularly accessible relative to GO Transit commuting as well for connecting to other Oakville Transit routes that provide connectivity across the Town.

The future cycling network will be well connected to support and encourage cycling as an option for both the first mile/last mile connections, but also for day-to-day trip making for residents, visitors, and employees of the commercial uses planned.

All of these accessibility features are consistent with and supportive of policies that various levels of governance (noted herein).

6.3.3 Improved Local Public Street Network Perspective

The planned public and private streets that form the framework of the Comprehensive Development Plan will facilitate the accessibility of the planned intensification within the Upper Kerr Village District. It will provide appropriate connectivity for pedestrians, cyclists, motorists and delivery and emergency services to circulate within the Subject Site as well as connect to the surrounding public rights of way and surrounding transportation systems. It will also provide a small measure of relief to certain minor movements within the existing public street network; however, it is not anticipated to negatively impact upon the subject development area.

6.4 REGIONAL AREA PERSPECTIVE

Notwithstanding the potential for the Draft OPA development potential to offer good alternatives to automobile travel through site design, existing and potential area transit improvements, and comprehensive TDM

programs and measures, the site is also well positioned to benefit from the adjacent and nearby regional road and highway network system.

This aspect of the Draft OPA development potential offers a balanced set of access opportunities. This will assist in ensuring that goods movements/deliveries and other servicing requirements, along with employees and residents who, given the choice elect to drive to and from the site, can still reasonably and safely access the site.

Eventual enhancements to the public transit system, contemplated as part of The Plan for Kerr Village and the previous transportation assessments (2009 Kerr Village Transportation Assessment and the 2009 Speers Road Environmental Study Report), and consistent with the Town's Livable Oakville Plan, will also contribute to the regional travel benefits that could be realized in the vicinity of the District.

From a regional area perspective, the Draft OPA development potential is consistent with the aforementioned planning documents since it maintains a balance between various modes of transportation accessibility – a balance that, as transit initiatives in the area are enhanced, can be shifted in favour of non-auto modes of travel.

7.0 UPPER KERR VILLAGE SITE MULTI-MODAL TRAVEL DEMAND FORECASTS

In response to comments received from the Town of Oakville Transportation staff, the trip generation calculations applied to the Subject Site have been expanded to illustrate the pre- and the post-adjusted trip generation parameters, discussed in the following sections.

7.1 BASELINE PARAMETERS

BA Group has forecast travel demand for each of the proposed land use components (residential and retail) considering the following:

- **Gross Person Trip Forecasting** – Adopted person trip rate back-calculated based on vehicular trip generation and mode split information from 2016 TTS data;
- **Interaction and Pass-by Considerations** – Account for interaction effects for each land use pairing based upon interaction rates documented within the ITE Trip Generation Handbook 3rd Edition and pass-by rates from the ITE Trip Generation Manual 9th Edition for retail uses; and
- **Application of Mode Share Assumptions** – Application of future mode split to the resultant net person trips for each land use to determine site travel demand by mode.

The following sections discuss the steps outlined above for each of the land uses proposed for the Site. References are made in regard to four types of trip making throughout the following sections. The terminology for these trip types is described below.

- **Gross Person Trip** – refers to all person trips to/from the Site, inclusive of trips both internal and external to the Site.
- **Internal Interaction Trip** – refers to trips made between the component land uses internal to the Site and would use the internal site facilities mostly as pedestrians; and
- **External Primary Trip** – refers to new trips directly generated by the Subject Site where the other end of the trip is external to the site and not within the site vicinity; and
- **External Pass-by Trip** – refers to existing trips along the travel corridor, where both ends of the trip are external to the Site, that are attracted to the site by some new land use (typically retail) provided by the Subject Site while these trip makers are on route for their existing trip

7.2 FORECAST APPROACH

Travel demand forecasts have been prepared, as part of this study, for the build-out of the proposed development based on the development statistics outlined in **Section 1.2**.

Trip generation for the proposed site has been conducted using the “back calculation” method by first deriving an appropriate vehicle trip rate to generate vehicle trips for each proposed land use. The resultant vehicle trips are then used to back calculate the associated person trips based on the existing (unadjusted) area auto mode share.

The internal person trip captures (interactions) have been determined according to the methodology described in Chapter 6 of the ITE Trip Generation Handbook, 3rd Edition. External site person trips for each land use are calculated by subtracting internal person trips from the total site person trips.

Travel demand of each mode for each use on the site has been established by applying the corresponding mode split parameters to the external site person trips.

Travel demand forecasts for the site reflect a higher level of non-auto use (i.e. transit and pedestrian trips) than existing today. This is reflective of the significant mix of uses in the site vicinity and various TDM measures proposed on-site, which are supportive of non-auto-based travel to and from the Site.

The following sections outline key technical assumptions used in establishing travel demand forecasts for the mix of uses on the site.

The adopted trip generation methodology was used to develop:

1. **Gross person trips** – number of gross person trips generated by each land use;
2. **Interaction person trips** – the degree to which different land uses interact with each other, thus decreasing the total number of external person trips;
3. **Net external trips** – number of external trips, after netting off interaction person trips from gross person trips;
4. **Mode split** – adopted future mode splits by land use;
5. **Multi-modal travel demand** – application of mode split to the net external trips to determine auto, transit, walking and cycling-based person trips; and
6. **Vehicle travel demand** – application of auto occupancy to the total auto-based person trips.

7.3 GROSS PERSON TRIPS FORECASTING

7.3.1 Base Residential Vehicle Trip Generation

'Base' residential vehicle trip generation were established based upon a review of trip generation rates from ITE Trip Generation Manual (11th Edition) for General Urban/Suburban settings as well as proxy trip generation counts of residential developments in similar contexts within the GTA and Oakville. Weekday morning and afternoon base residential site vehicle traffic volumes are summarized in **Table 3**.

TABLE 3 BASE RESIDENTIAL VEHICLE TRIP GENERATION

Proxy Site Location	Survey Date	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 McMurchy Ave S Brampton	Thu, Aug 29, 2019	271	0.04	0.15	0.18	0.12	0.10	0.22
440 McMurchy 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	0.16	0.24	0.16	0.13	0.28
Average Vehicle Trip Rate (Including ITE)			0.06	0.17	0.23	0.17	0.10	0.27
Adopted Vehicle Trip Rate (Unadjusted)			0.06	0.17	0.23	0.17	0.10	0.27
Base Residential Site Vehicle Trips (1,842 units)			115	310	425	315	190	505

Notes:

1. Proxy trip surveys conducted by BA Group at the aforementioned sites.
2. Vehicle trips have been rounded to the nearest 5.

The current development proposal features a total of approximately 1850 residential units across the entire Subject Site based upon the intensities developed in the Draft OPA. Under the ultimate condition (i.e., full building out of the Subject Site), the “base” residential vehicle trips, before applying the mode split reduction, generated by the proposed development is expected to be in the order of **425 and 505 two-way vehicle trips** during the weekday morning and afternoon peak hours, respectively,

7.3.2 Base Retail Vehicle Trip Generation

The retail traffic of the proposed development was generated based on application of the average rate of ITE820 (Shopping Centre) from the ITE Trip Generation Manual 11th Edition. The trip generation rates in the ITE Trip Generation Manual 11th Edition for Land Use 820 – Shopping Centre are derived based on a wide range of retail uses, including boutique and ancillary sized retail stores, medium-sized strip malls and large retail outlets. Although the occupant of the retail land use on the site is unknown at this stage, the retail uses

on-site are expected to consist of both a grocery store and small ancillary stores. Thus, BA Group is in the opinion that it is appropriate to use the LU820 – Shopping Centre to determine the retail trip generation for the proposed development.

In addition, and in response to comments provided by the Town of Oakville staff, the trip generation rates in the ITE Trip Generation Manual 11th Edition for Land Use 232 – High-Rise Residential with Ground-Floor Retail are derived based on a very limited number of sample points (2 samples for the AM Peak hour and 3 samples for the PM Peak hour). Thus, this analysis has projected the travel demand for the residential and retail land uses separately, based on the methodology outlined in the ITE Trip Generation Handbook (3rd Edition).

The current development proposal features a total of 7,915 m² of retail GFA. The proposed retail uses within the 588 Kerr Street and 171 Speers Road developments are expected to operate ancillary to the overall development (i.e., a relatively small amount of retail GFA spread amongst several buildings and primarily serving residents of the building and the immediate area). In this regard, vehicle trip generation associated with retail uses in these blocks is expected to be minimal. Vehicle trip generation associated with retail uses in 550 Kerr Street, 530 Kerr Street and 131 Speers Road developments (approximately 6,012 m² or 64,715 ft² GFA in total) is summarized in **Table 4**.

TABLE 4 BASE RETAIL VEHICLE TRIP GENERATION

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
ITE820 – Shopping Centre ¹	0.52	0.32	0.84	1.63	1.77	3.40
Retail Site Vehicle Trips (64,715 ft² GFA)	30	20	50	95	105	200

Notes:

1. Trip rates calculated in trips per 1,000 ft² GLA.
2. The retail GLA is assumed to be 90% of the GFA.

Under the ultimate condition (i.e., full building out of the Subject Site), the “base” retail vehicle trips, before applying the mode split reduction, generated by the proposed development is expected to be in the order of **50 and 200 two-way vehicle trips** during the weekday morning and afternoon peak hours, respectively.

7.3.3 Base Multi-Modal Trip Generation

A review of modal split values for the Town of Oakville from TTS 2016 data sets reveals that the Upper Kerr Village area of the Town is performing significantly better than the Town of Oakville as a whole. Multi-modal trip generation for the residential and retail uses on the site before applying mode split adjustment to reflect the Site’s location and transportation characteristics are provided in **Table 5**.

TABLE 5 SITE MULTI-MODAL TRIP GENERATION (UNADJUSTED)

Mode	Residential						Retail					
	AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
	In	Out	2Way	In	Out	2Way	In	Out	2Way	In	Out	2Way
Driver	57%	57%		67%	67%		83%	83%		71%	71%	
Passenger	13%	13%		13%	13%		9%	9%		21%	21%	
Transit	22%	22%		16%	16%		3%	3%		3%	3%	
Walk	7%	7%		4%	4%		1%	1%		5%	5%	
Cycle	1%	1%		0%	0%		4%	4%		0%	0%	
Total	100%	100%		100%	100%		100%	100%		100%	100%	
Driver	94	252	346	264	159	423	27	18	45	73	81	154
Passenger	21	58	79	51	31	82	3	2	5	22	24	46
Transit	36	97	133	63	38	101	1	1	2	3	3	6
Walk	12	31	43	16	10	26	0	0	0	5	5	10
Cycle	2	4	6	0	0	0	1	1	2	0	0	0
Total	165	442	607	394	238	632	32	22	54	103	113	216

Notes:

1. AM residential mode splits based on morning peak period residential outbound trips; PM residential mode-splits based on afternoon peak period residential inbound trips
2. Retail mode splits based on peak period two-way retail trips
3. Based on trips to/from TTS zones 4009 and 4011-4013.

Weekday morning and afternoon peak hour gross person trips are summarized in **Table 6**.

TABLE 6 SITE GROSS PERSON TRIP GENERATION

Proxy Survey Location	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Total Residential Person Trips	165	442	607	394	238	632
Total Retail Person Trips	32	22	54	103	113	216
Total Site Gross Person Trips	197	464	661	497	351	848

Under the ultimate condition (i.e., full building out of the Subject Site), the proposed Upper Kerr Village master plan development is expected to generate in the order of 661 and 848 person trips during the weekday morning and afternoon peak hours, respectively.

7.4 INTERACTION CONSIDERATIONS

The presence of multiple land uses (residential and retail) on-site supports the potential for internal trips between these uses. These trips are not considered to be external to the site but will be made primarily by walking between the uses within the proposed development. As a result, the total external trip generation may be less than the sum of the trips that are generated by each discrete land use. The methodology for internal trip capture is described in detail in Chapter 6 of the ITE Trip Generation Handbook, 3rd Edition.

These internal trips are removed from the trip generation potential of both the origin land use and the destination land use (or from both ends of the origin-destination, or “O-D”, pairing). For example, one internal trip that originates from the residential component and ends in the retail component of the site is equivalent to one outbound internal trip for the residential component and one inbound internal trip for the retail component. If the residential component is forecasted to generate 10 total outbound trips in an hour, 1 of those outbound trips would be internal, while the remaining 9 outbound trips would be external. It can also be stated as *total trip generation potential of each land use = internal trips + external trips*.

Consequently, external site trips for each specific land use are equal to the total site trips for each land use subtracted by the internal site trips. The external site trips represent the trips that would ultimately be experienced on the area transportation network. In order to estimate the number of internal trips to and from each land use to another, the methodology outlined in Chapter 6 of the ITE Trip Generation Handbook was adopted. A summary of the external and internal site trips during the peak hours is provided in **Table 7**.

TABLE 7 EXTERNAL AND INTERNAL PERSON TRIP GENERATION SUMMARY

Land Use	Trip Type	AM Peak Hour			PM Peak Hour		
		In	Out	2Way	In	Out	2Way
Residential	Total	165	442	607	394	238	632
	Internal	3	4	7	29	10	39
	External	162	438	600	365	228	593
Retail	Total	32	22	54	103	113	216
	Internal	4	3	7	10	29	39
	External	28	19	47	93	84	177
Total	Total	197	464	661	497	351	848
	Internal	7	7	14	39	39	78
	External	190	457	647	458	312	770

7.5 SITE MULTI-MODAL TRAVEL DEMAND

The mode split summarized in **Table 5** reflects area travel characteristics under existing conditions. Under future conditions, the auto mode share is expected to further diminish as a result of: 1) improved transit services both in the site vicinity and further away in the city make transit a more appealing option of travel; 2) improved cycling and pedestrian facilities that increase comfort for pedestrians and cyclists and thus allow people to shift towards active transportation options; 3) intensification anticipated in the area enhances mixing of different uses, which improves interactions between them and reduces the need for longer-distance travel by driving; 4) TDM measures provided on the site and in the site vicinity that promotes travelling using non-auto mode.

The target mode share indicated in the Town of Oakville's Transportation Master Plan *Switching Gears* is 20% by 2031. It is noted that under existing conditions, the residential mode split in the Upper Kerr Village area has already reached this target during the weekday morning peak hour and is just below the target during the weekday afternoon peak hour.

This analysis assumes a 5% increase in transit mode share in the future for the residential land use. For the retail land use, the target transit mode share of 20% is assumed for the future condition. An additional 5% mode share increase in active transportation modes (walking and cycling) are also assumed, reflecting improved active transportation facilities that are planned in the area. The auto driver mode share has been reduced and offset by the modal shares of transit, walking and cycling. The resulting mode split adjustments are summarized in **Table 8**.

TABLE 8 FUTURE TRAVEL MODE SPLIT ADJUSTMENT

Mode	Residential			Retail		
	Existing	Future	Difference	Existing	Future	Difference
Driver	57% (67%)	47% (57%)	-10% (-10%)	83% (71%)	61% (49%)	-22% (-22%)
Passenger	13% (13%)	13% (13%)	0% (0%)	9% (21%)	9% (21%)	0% (0%)
Transit	22% (16%)	27% (21%)	+5% (+5%)	3% (3%)	20% (20%)	+17% (+17%)
Walk	7% (4%)	9% (6%)	+2% (+2%)	1% (5%)	3% (7%)	+2% (+2%)
Cycle	1% (0%)	4% (3%)	+3% (+3%)	4% (0%)	7% (3%)	+3% (+3%)
Total	100% (100%)	100% (100%)		100% (100%)	100% (100%)	

The resulting site multi-modal trip generation, after the mode split adjustments, are summarized in **Table 9**.

TABLE 9 SITE MULTI-MODAL TRIP GENERATION (ADJUSTED)

Mode	Residential						Retail					
	AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
	In	Out	2Way	In	Out	2Way	In	Out	2Way	In	Out	2Way
Driver	47%	47%		57%	57%		61%	61%		49%	49%	
Passenger	13%	13%		13%	13%		9%	9%		21%	21%	
Transit	27%	27%		21%	21%		20%	20%		20%	20%	
Walk	9%	9%		6%	6%		3%	3%		7%	7%	
Cycle	4%	4%		3%	3%		7%	7%		3%	3%	
Total	100%	100%		100%	100%		100%	100%		100%	100%	
Driver	76	206	282	208	130	338	17	11	28	45	41	86
Passenger	21	57	78	47	29	76	2	2	4	20	17	37
Transit	44	118	162	77	48	125	6	4	10	19	17	36
Walk	15	39	54	22	14	36	1	1	2	6	6	12
Cycle	6	18	24	11	7	18	2	1	3	3	3	6
Total	162	438	600	365	228	593	28	19	47	93	84	177

The residential component of the proposed development is expected to generate in the order of **360 and 414 two-way auto trips** during the weekday morning and afternoon peak hours, respectively.

The residential component of the proposed development is expected to generate in the order of **240 and 179 non-auto person trips** during the weekday morning and afternoon peak hours, respectively.

The retail component of the proposed development is expected to generate in the order of **32 and 123 two-way auto trips** during the weekday morning and afternoon peak hours, respectively.

The retail component of the proposed development is expected to generate in the order of **15 and 54 non-auto person trips** during the weekday morning and afternoon peak hours, respectively.

7.6 SITE VEHICLE TRAVEL DEMAND

Site auto trip generation for the residential and retail land uses associated with the Subject Site are summarized in **Table 10**.

It is important to note that not all retail traffic volumes entering or exiting the site driveways are new traffic added to the street system. A pass-by trip is made as an intermediate stop on the way from an origin to a primary trip destination without a route diversion and therefore not a new trip to the overall roadway network. A primary trip is made for the specific purpose of visiting the generator and is a new trip that will be added to the overall road network.

For the purpose of this analysis, a 0% and 30% pass-by rate was assumed for the weekday morning and afternoon peak hour periods, respectively, based on provisions from the *ITE Trip Generation Manual 3rd Edition*.

TABLE 10 SITE VEHICLE TRIP GENERATION

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Residential Vehicle Trips	95	265	360	255	160	415
Residential Vehicle Trip Rate ¹	0.05	0.14	0.20	0.14	0.09	0.23
Retail Vehicle Trips	20	15	35	65	60	125
Retail Vehicle Trip Rate ²	0.34	0.26	0.60	1.12	1.03	2.15
<i>Pass-by Trips (30%)</i>	5	5	10	20	20	40
<i>Primary Trips (70%)</i>	15	10	25	45	40	85
Total New Site Traffic	115	280	395	320	220	540

Notes:

1. Residential trip rates calculated in trips per unit.
2. Retail trip rates calculated in trips per 1,000 ft² GLA.

The proposed development is anticipated to generate in the order of **395 and 540 two-way vehicle trips** during the weekday morning and afternoon peak hours, respectively.

Site auto trip generation for each phase are established by applying the residential and retail trip rates from **Table 10** to the proposed number of units and retail GLA under each phase, as summarized in **Table 11**.

TABLE 11 SITE VEHICLE TRIP GENERATION BY PHASE

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Phase 1 Vehicle Trips						
Residential Vehicle Trips (687 units)	35	95	130	95	60	155
Retail Vehicle Trips (2,339 m ² GFA)	5	5	10	15	15	30
<i>Pass-by Trips (30%)</i>	0	0	0	5	5	10
<i>Primary Trips (70%)</i>	5	5	10	10	10	20
Total New Site Traffic (Phase 1)	40	100	140	110	75	185
Phase 2 Vehicle Trips						
Residential Vehicle Trips (1,157 units)	60	165	225	160	100	260
Retail Vehicle Trips (3,319 m ² GFA)	5	5	10	15	15	30
<i>Pass-by Trips (30%)</i>	0	0	0	5	5	10
<i>Primary Trips (70%)</i>	5	5	10	10	10	20
Total New Site Traffic (Phase 2)	65	170	235	175	115	290
Ultimate Condition Vehicle Trips						
Residential Vehicle Trips (1,842 units)	95	265	360	255	160	415
Retail Vehicle Trips (7,915 m ² GFA)	20	15	35	65	60	125
<i>Pass-by Trips (30%)</i>	5	5	10	20	20	40
<i>Primary Trips (70%)</i>	15	10	25	45	40	85
Total New Site Traffic (Ultimate)	115	280	395	320	220	540

8.0 SUMMARY OF TRANSPORTATION ANALYSES PARAMETERS

8.1 STUDY AREA

The study area adopted for the transportation assessment is depicted in **Figure 2** along with the existing public street lane configurations at corresponding key intersections assessed.

This study area was premised upon the 2009 Kerr Village Transportation Assessment recognizing that changes being proposed as part of the Draft OPA and associated lands only affected the lands north of Speers Road while also recognizing that the principal directions of vehicular travel for lands north of Speers will be east/west along Speers with a relatively strong orientation towards and from the Highway 403/QEW corridor.

Traffic operations analyses were undertaken at the following intersections in the site vicinity:

Signalized Intersections:

- Speers Road / Kerr Street
- Speers Road / Cross Avenue
- Speers Road / Dorval Road
- Kerr Street / Stewart Street
- Dorval Road / Wyecroft Road
- Kerr Street / Shepherd Road (future condition)
- Speers Road / St. Augustine Drive (future condition)

Unsignalized Intersections:

- Speers Road / St. Augustine Drive (existing condition)
- Kerr Street / Shepherd Road (existing condition)
- Kerr Street / Wyecroft Road
- Kerr Street / Prince Charles Drive
- Kerr Street / Elmwood Road
- Speers Road / Interim Private Street Connection (future condition)

8.2 HORIZON YEARS

Transportation analyses have been completed for existing conditions (year 2021) and horizon years 2031 (Interim conditions) and 2036 (Ultimate conditions).

8.3 ANALYSIS PERIODS

Traffic operations analyses were undertaken for the weekday morning and afternoon peak hours.

8.4 EXISTING TRAFFIC VOLUME CONDITIONS

BA Group prepared a composite existing traffic volume base that included the following considerations:

- November 2021 base traffic volumes for all study area intersection being assessed;
- Adjustments to November 2021 base volumes to reflect traffic volume magnitudes that ensured non-Covid-19 conditions were taken into consideration and appropriate volumes are used for base conditions;
- April 2019 traffic counts along the study area network were compared to the November 2021 counts and where the April 2019 volumes were higher, they were adopted for analyse purposes.
- The assumption has been that since the start of Covid-19 in March of 2020 growth in traffic volumes has obviously not occurred and the resulting 2019 adjustments to 2021 volumes serves as a base 2021 condition.

Figure 4 illustrates the existing traffic volumes adopted for analysis purposes.

8.5 FUTURE BACKGROUND TRAFFIC VOLUME CONDITIONS

BA Group forecast future traffic volume unrelated to the intensification of the Subject Site by way of two methods:

- Area development projects that would be generating traffic in the study area that would materially add traffic to the subject streets being assessed.
 - This “development related” traffic included the following developments listed in **Table 12**.
- Corridor growth along major corridors in the study area on the through movements at a compounded rate of 1.3% per annum up to 2031 and one half of that rate to 2036.

TABLE 12 BACKGROUND DEVELOPMENTS CONSIDERED

Development	Development Statistics	Source	Date
North Service Road With QEW Ramp Hotel	114 hotel rooms	LMM Engineering Inc.	Aug 2018
224-234 Kerr St 10, 118, 120 & 124 Deane Ave	126 residential units	No TIS	
58 & 62 Shepherd Rd	192 residential units 9 live-work units	No TIS	
271 Cornwall Rd 485 Trafalgar Rd	292 residential units 4,065 sm retail GFA	R.J. Burnside	Jul 2019
157 Cross Ave	252 residential units 289 sm retail GFA 579 sm office GFA	Trans-Plan	Jan 2019
50 Speers Rd	334 residential units	BA Group	To be submitted

Figure 5 illustrates the Background Development traffic assignment. Figure 6 illustrates the Future Background traffic volumes including the background development related allowances and corridor growth percentage allowances. Figure 6 forms the basis for adding Draft OPA traffic volumes forecasts which are explained below.

8.6 SITE TRAFFIC VOLUMES

8.6.1 Existing Site Traffic

No existing traffic data is available for the existing retail plaza that the Site is currently located on. Therefore, BA Group consulted the *ITE Trip Generation Manual 11th Edition* to estimate the number of trips currently generated by the retail plaza. Assignment of existing retail plaza trips to the road network is based on the existing local area traffic patterns. A 30% pass-by rate was assumed based on provisions from the *ITE Trip Generation Manual 3^d Edition*. Site traffic of the existing cinema was established based on turning movement count information collected by BA Group at existing cinema driveways. Trip generations of the existing plaza and cinema are summarized in **Table 13**.

TABLE 13 EXISTING SITE TRAFFIC GENERATION

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Existing Retail Plaza Site Traffic						
ITE820 – Shopping Centre <i>(General Urban/Suburban)</i> ¹	0.52	0.32	0.84	1.63	1.77	3.40
Existing Retail Plaza Trips (126,000 ft ² GFA)	60	35	95	185	200	385
<i>Pass-by Trips (30%)</i>	15	15	30	60	60	120
<i>Primary Trips (70%)</i>	45	20	65	125	140	265
Existing Cinema Site Traffic						
Existing Cinema Site Traffic	20	0	20	20	15	35
Total Existing Site Traffic						
Total Existing Site Traffic	80	35	115	205	215	420

Notes:

1. Rate specified in trips per 1,000 ft² GLA.
2. The retail GLA is assumed to be 90% of the GFA.

The existing retail plaza generates in the order of **95 and 385 two-way trips** during the weekday morning and afternoon peak hours, respectively.

With the build-out of 588 Kerr Street, 550 Kerr Street, 530 Kerr Street and 131 Speers Road, the existing retail plaza will be demolished. For this analysis, the existing primary site traffic was removed from the area road network. The existing pass-by trips were removed from the relevant existing site driveways and reassigned back onto adjacent corridors.

The existing cinema is expected to generate in the order of **20 and 35 two-way trips** during the weekday morning and afternoon peak hours, respectively.

With the build-out of 171 Speers Road, the existing cinema will be demolished. Trips generated by the existing cinema were removed from the area road network for the analysis of Phase 2 and Ultimate Build-Out conditions when 171 Speers Road is developed.

8.6.2 Trip Generation

An outline of the net new vehicular trips expected as a result of each phase of the proposed development is provided in **Table 14**.

TABLE 14 SITE TRAFFIC GENERATION SUMMARY

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Phase 1 Trip Generation						
Total Site Trips	40	100	140	110	75	185
Existing Site Trips Removal	-60	-35	-95	-185	-200	-385
Net New Site Trips	-20	65	45	-75	-125	-200
Phase 2 Trip Generation						
Total Site Trips	65	170	235	175	115	290
Existing Site Trips Removal	-80	-35	-115	-205	-215	-420
Net New Site Trips	-15	135	120	-30	-100	-130
Ultimate Condition Trip Generation						
Total Site Trips	115	280	395	320	220	540
Existing Site Trips Removal	-80	-35	-115	-205	-215	-420
Net New Site Trips	35	245	280	115	5	120

The proposed development is anticipated to generate in the order of **395 and 540 two-way trips** during the weekday morning and afternoon peak hours, respectively. The existing site uses generate in the order of **115 and 420 two-way trips** during the weekday morning and afternoon peak hours, respectively. Thus, the Project will result in a net reduction of **280 and 120 two-way trips** during the weekday morning and afternoon peak hours, respectively.

8.6.3 Trip Distribution and Assignment

Vehicular distribution was estimated based upon a review of the 2016 TTS origin and destination (OD) data sets for the Upper Kerr Village area. A further review of general traffic patterns and land use distribution within Kerr Village and surrounding areas was also included to estimate the likely travel patterns of residential land uses situated in this area of the Town of Oakville. **Table 15** summarizes the vehicular distribution adopted for analyses purposes.

TABLE 15 UPPER KERR VILLAGE SITE TRAFFIC DISTRIBUTION

Directions	Residential		Retail	
	Outbound ¹	Inbound ²	Outbound ³	Inbound ⁴
To/From East on Highway 403	38%	31%	13%	21%
To/From West on Highway 403	21%	10%	10%	4%
To/From North on Kerr St	7%	9%	13%	7%
To/From South on Kerr St	8%	10%	13%	6%
To/From South on Dorval Dr	6%	2%	19%	1%
To/From East on Speers Rd	8%	16%	15%	26%
To/From West on Speers Rd	4%	12%	5%	15%
To/From West on Wycroft Rd	4%	5%	1%	14%
To/From South on Queen Mary Dr	4%	5%	11%	6%
Total	100%	100%	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.

8.6.4 Subject Site Traffic Assignments

8.6.4.1 Development Phasing Characteristics

Vehicular traffic assignments have been prepared to represent two future conditions:

- An Interim Condition (2031) – where 171 Speers Road lands are assumed to NOT redevelop; and,
- An Ultimate Condition (2036) – where all of the Subject Site are assumed to redevelop.

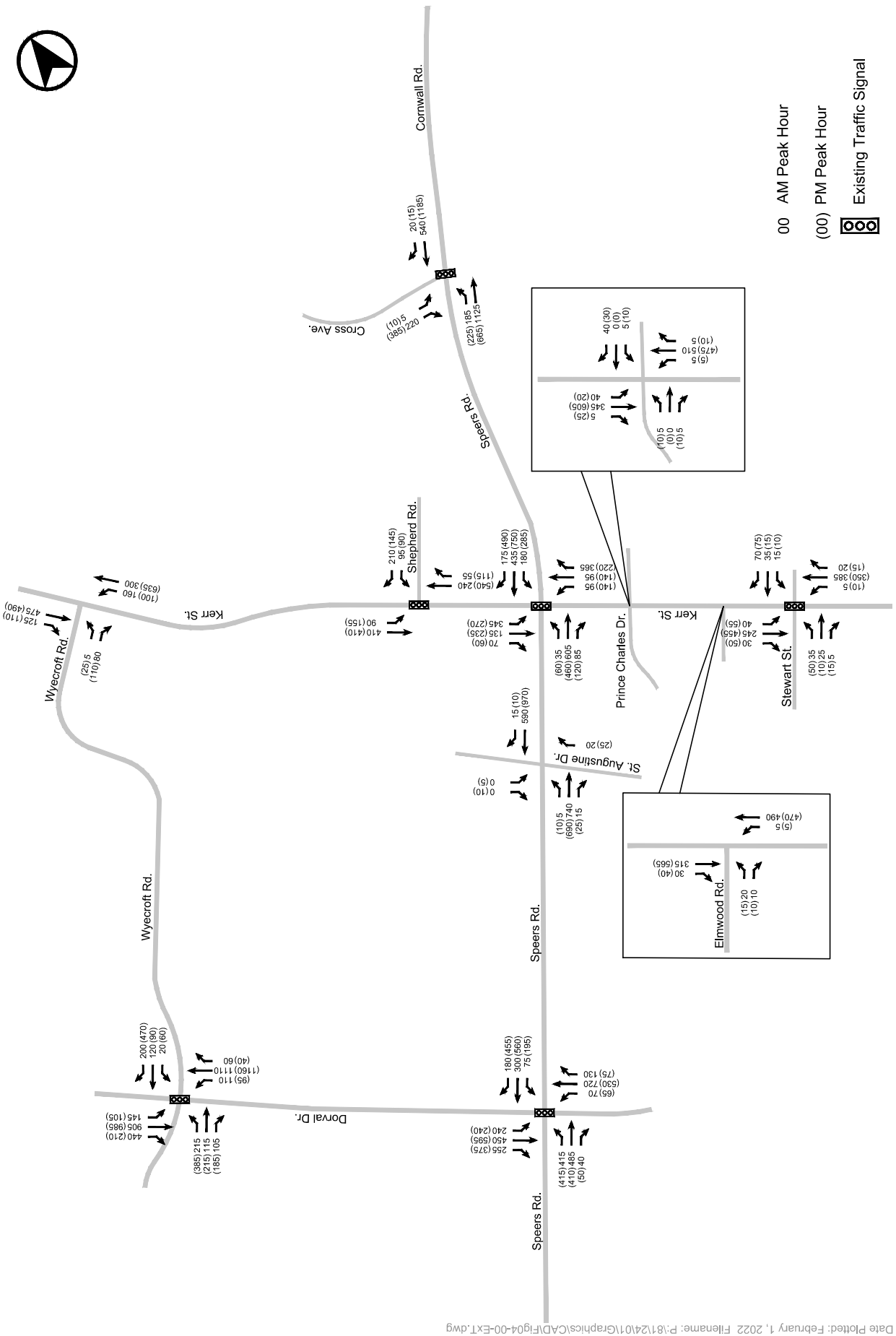
These two conditions examine the resulting operating conditions in response to potential redevelopment decisions associated with 171 Speers Road. We note that the Subject Site can be configured in response to this condition given the “private street” proposed within the Subject Site. The private street provides flexibility through an interim public park configuration. The private street on the east side of the public park could be initially connected to Speers Road offering a phased introduction of a street network that can respond to the collective needs of development (from both accessibility and circulation perspectives), prior to the 171 Speers Road property being redeveloped. Implementing segments of the Private Street – given an overall street network plan to work towards – would be more efficiently and cost effectively undertaken given the flexibility of the private Local Street.

These conditions are carried through the analyses.

The following figures illustrate the various scenarios analyzed herein:

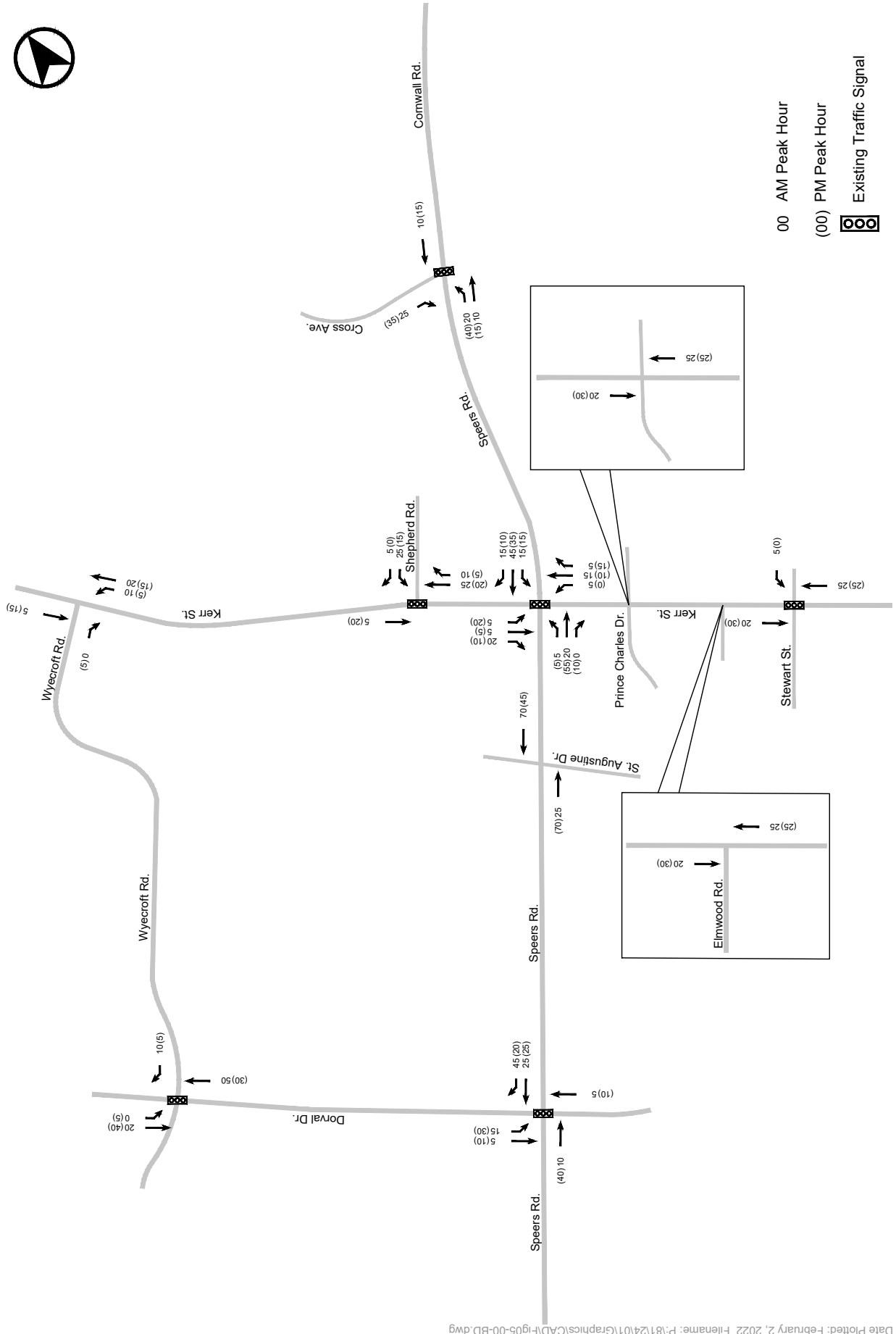
- **Figure 7** – illustrates the Existing Subject Site Traffic volume Removal (Interim Condition)

- **Figure 8** – illustrates the Existing Subject Site Traffic volume Removal (Ultimate Condition)
- **Figure 9** – illustrates the New Subject Site Traffic Volume (Interim Condition)
- **Figure 10** – illustrates the New Subject Site Traffic Volume (Ultimate Condition)
- **Figure 11** – Net New Subject Site Traffic Volume (Interim Condition)
- **Figure 12** – Net New Subject Site Traffic Volume (Ultimate Condition)
- **Figure 13** – Future Total Traffic Volumes (Interim)
- **Figure 14** – Future Total Traffic Volumes (Ultimate)



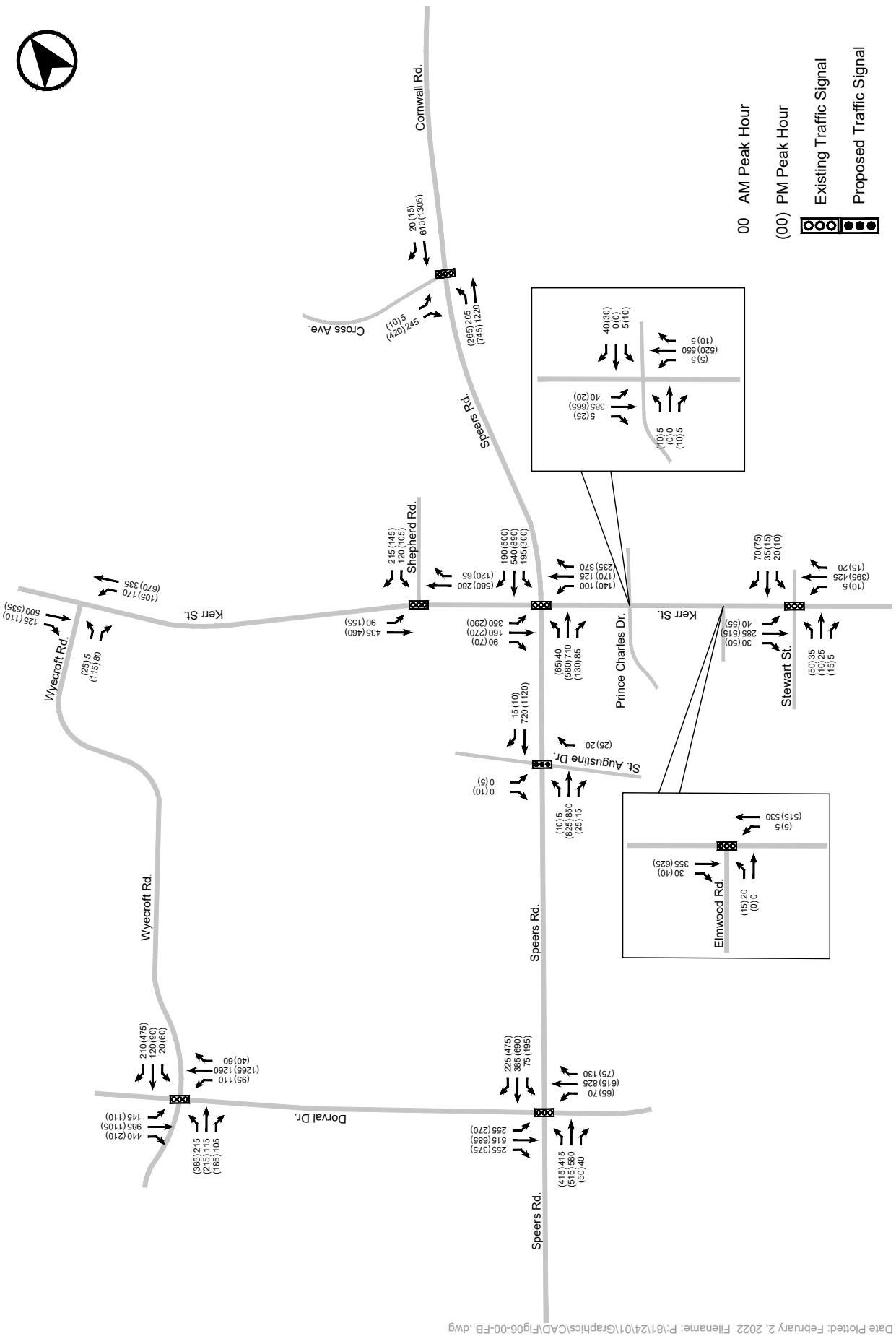
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FIGURE 4 EXISTING TRAFFIC VOLUMES



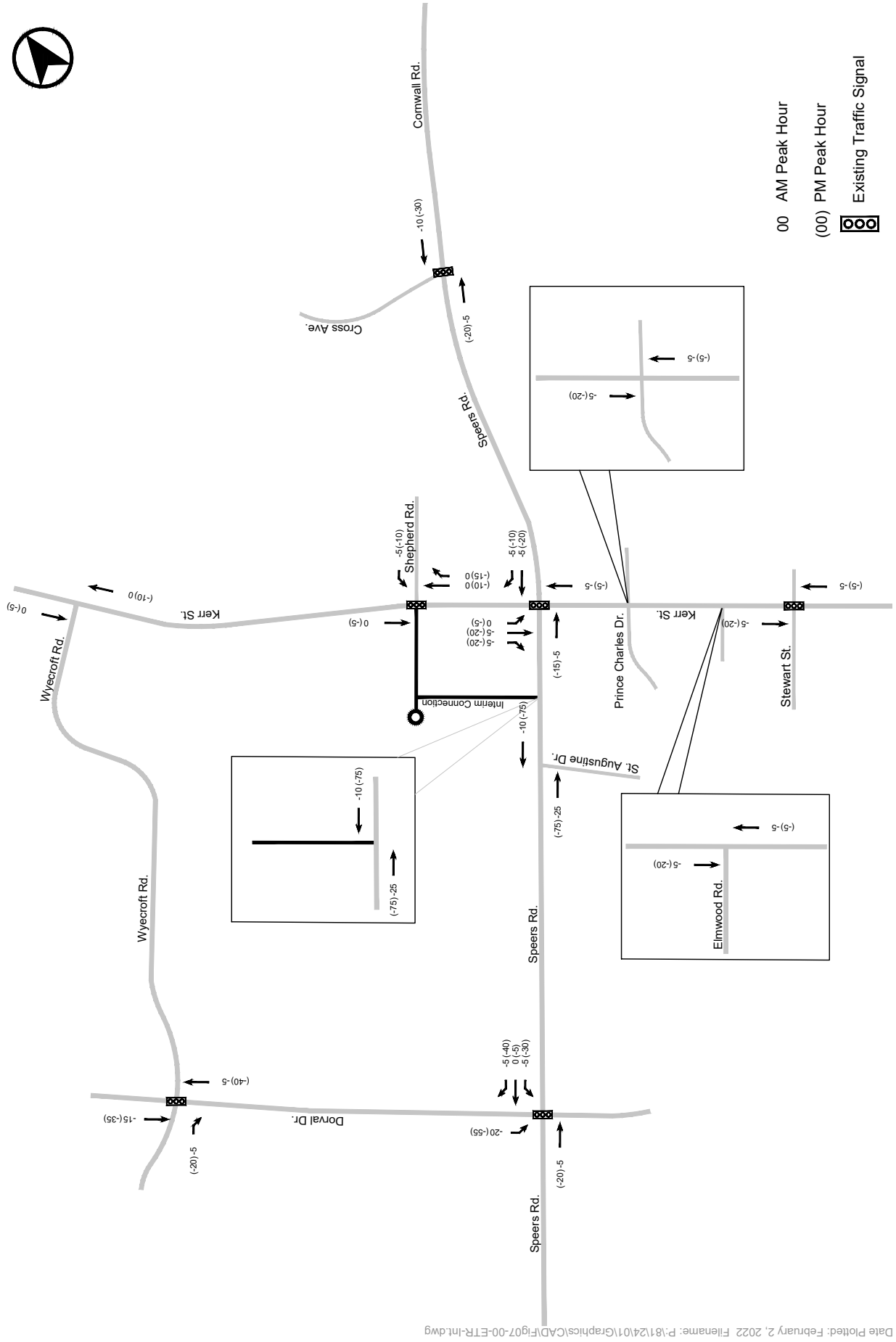
Date Plotted: February 2, 2022 File name: P:\8124\01\Graphics\CAD\Fig05-00-BD.dwg

FIGURE 5 BACKGROUND DEVELOPMENT TRAFFIC VOLUMES



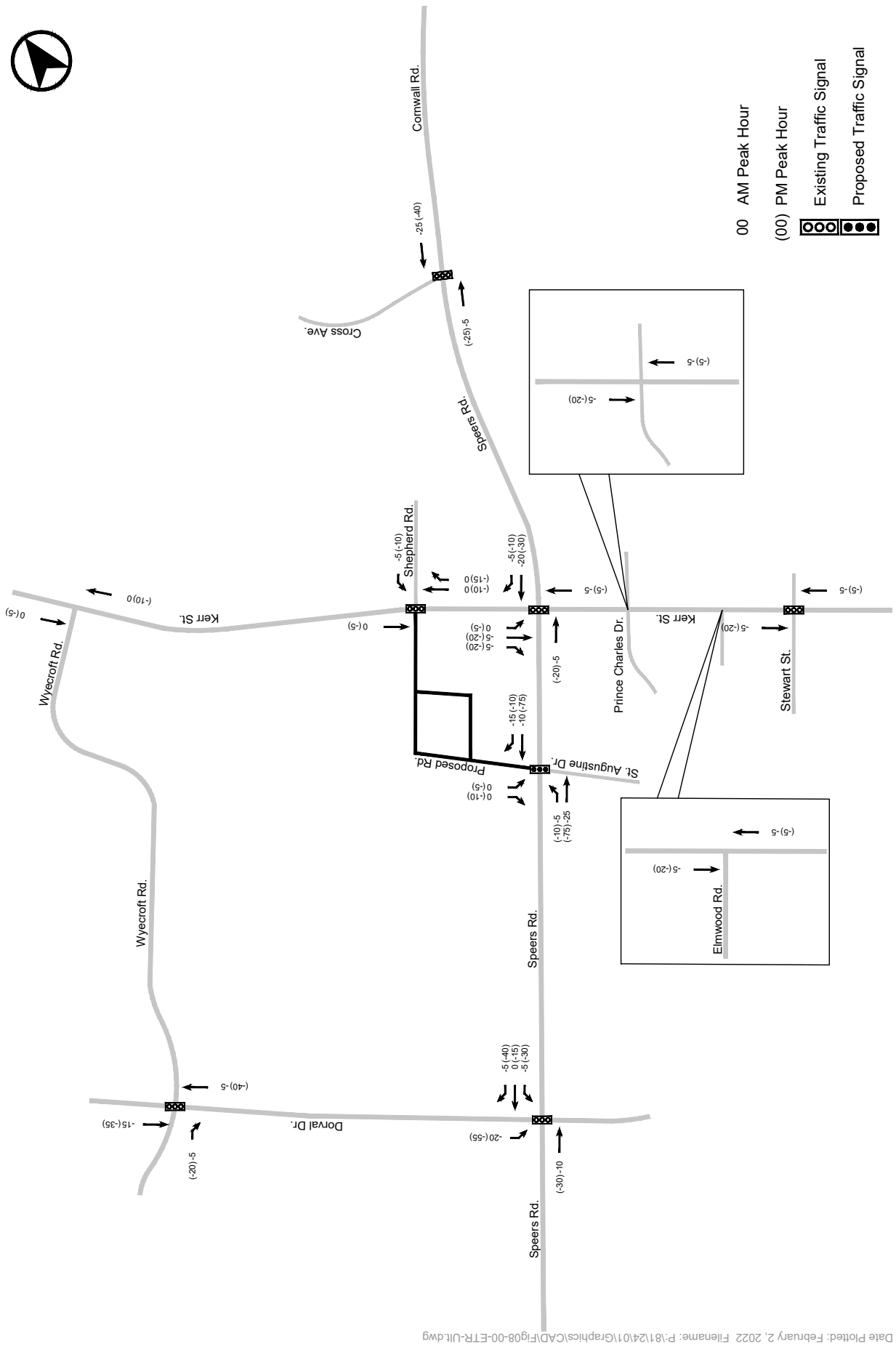
Date Plotted: February 2, 2022 File name: P:\8124\01\Graphics\CAD\Fig06-00-FB.dwg

FIGURE 6 FUTURE BACKGROUND TRAFFIC VOLUMES



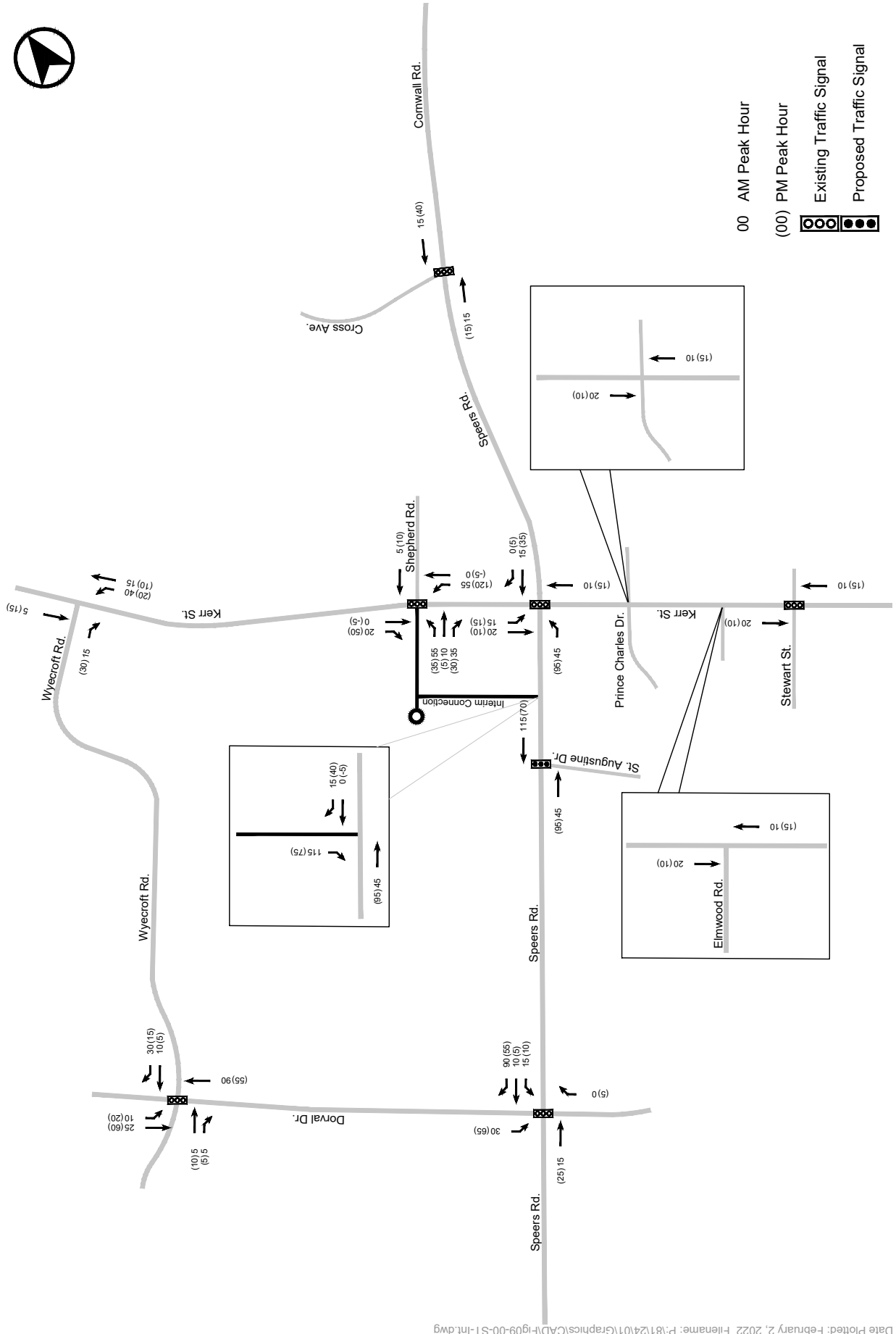
Date Plotted: February 2, 2022 Filename: P:\8124\01\Graphics\CAD\Fig07-00-ETR-Int.dwg

FIGURE 7 EXISTING SITE TRAFFIC VOLUMES REMOVAL (INTERIM)



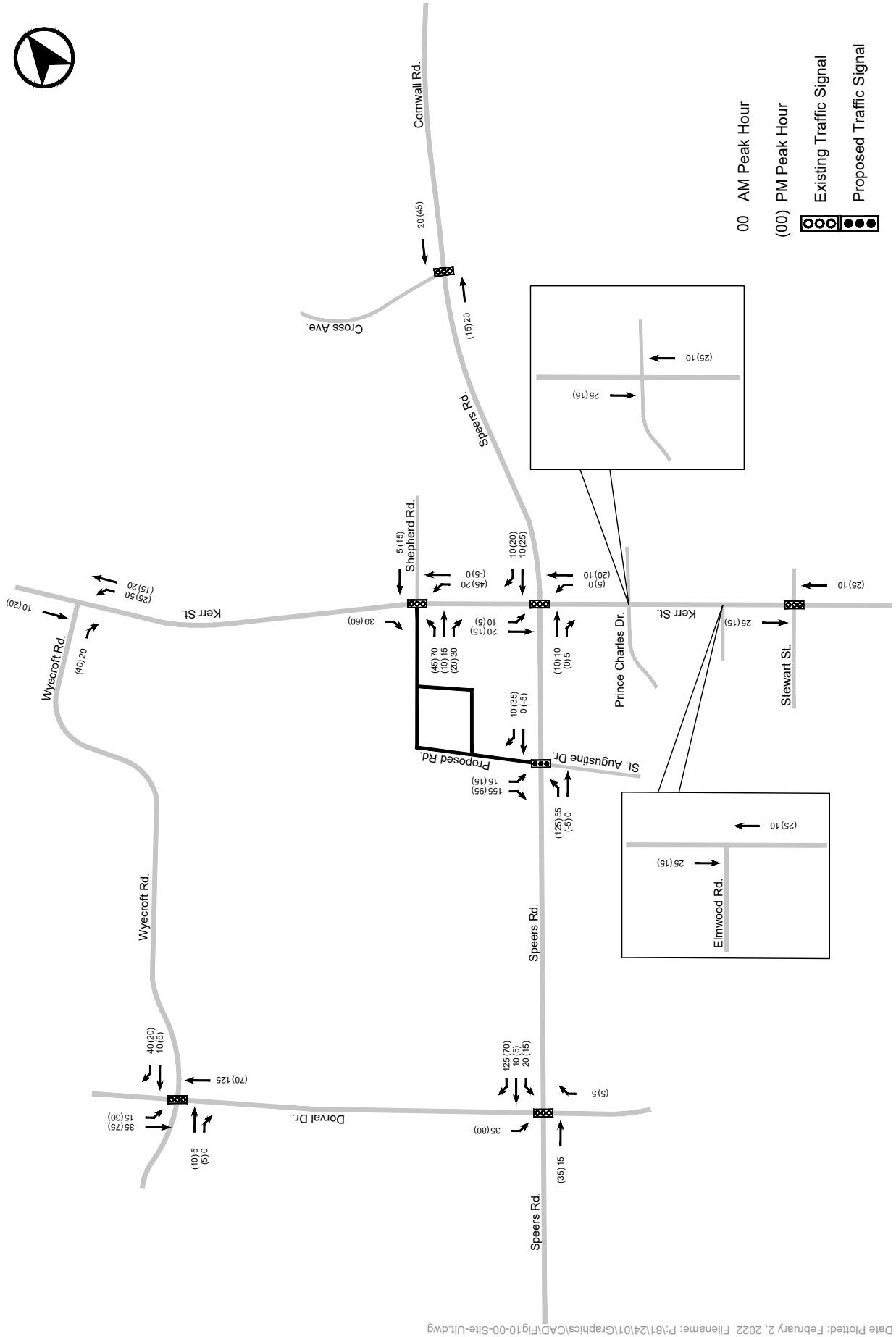
Date Plotted: February 2, 2022 File name: P:\8124\01\Graphics\CAD\Fig08-00-ETR-Ult.dwg

FIGURE 8 EXISTING SITE TRAFFIC VOLUMES REMOVAL (ULTIMATE)



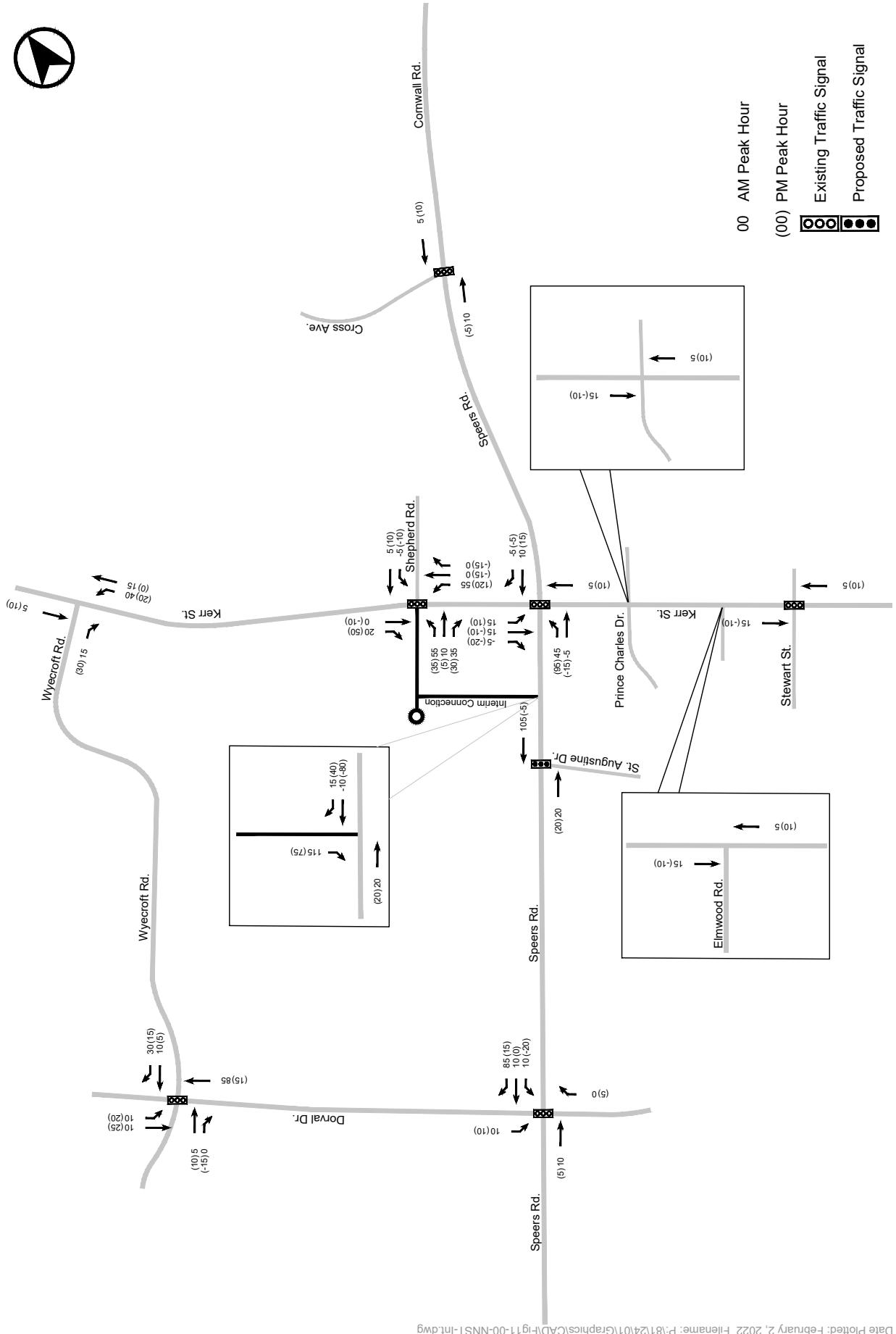
Date Plotted: February 2, 2022 Filename: P:\8124\01\Graphics\CAD\Fig09-00-ST-Int.dwg

FIGURE 9 NEW SITE TRAFFIC VOLUMES (INTERIM)



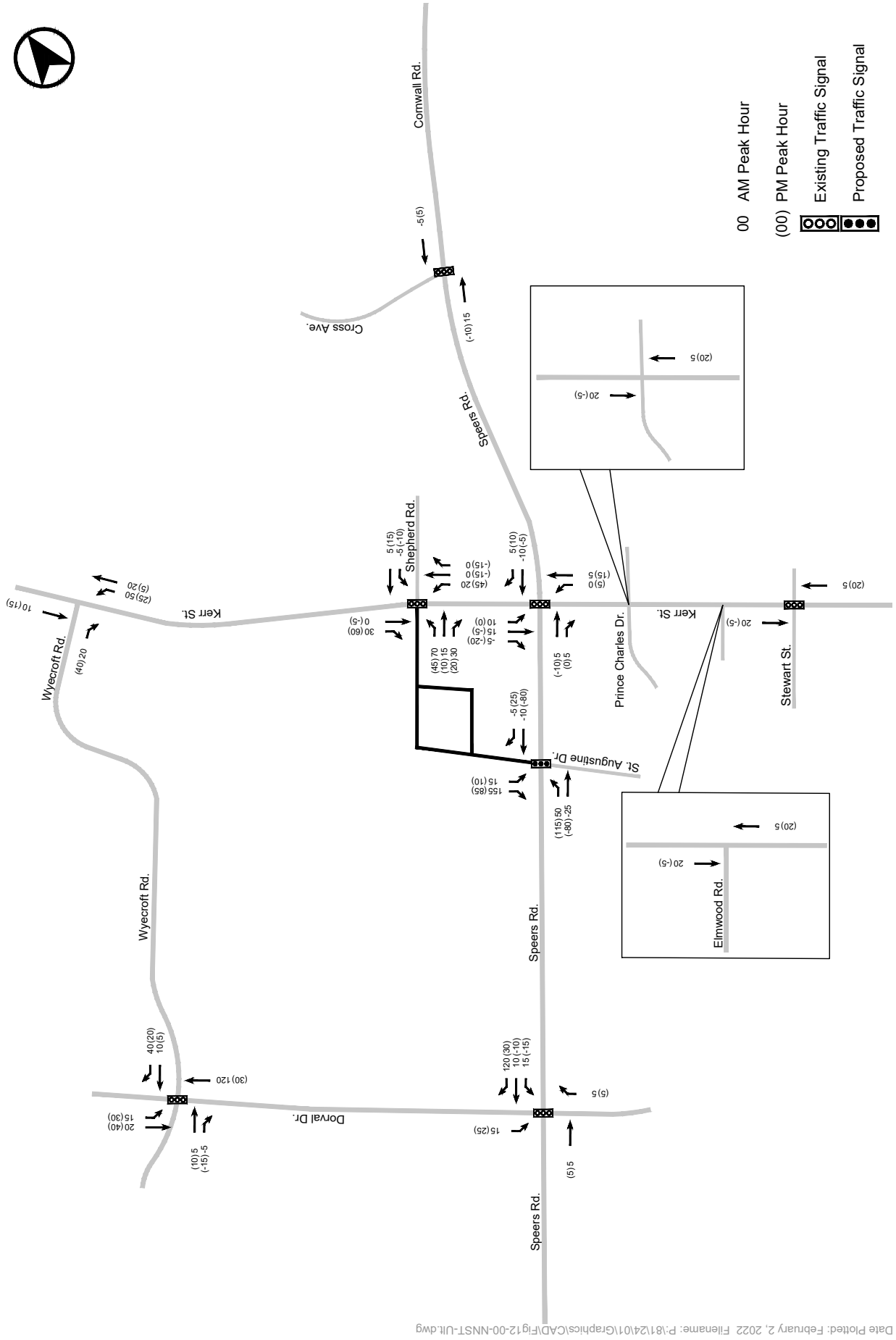
Date Plotted: February 2, 2022 File name: P:\8124\01\Graphics\CAD\Fig10-00-Site-Ult.dwg

FIGURE 10 NEW SITE TRAFFIC VOLUMES (ULTIMATE)



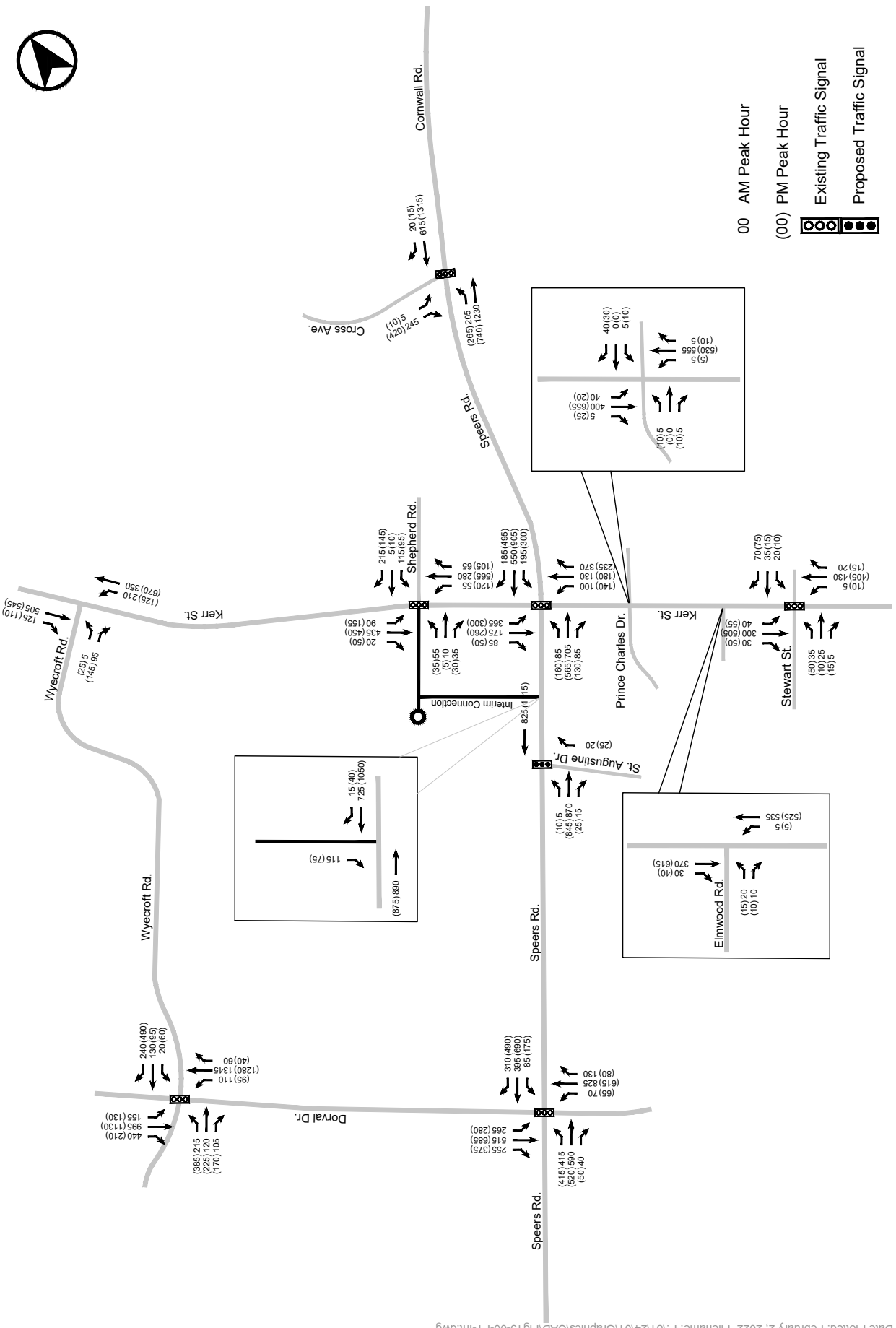
Date Plotted: February 2, 2022 File name: P:\8124\01\Graphics\CAD\Fig11-00-NNST-Int.dwg

FIGURE 11 NET NEW SITE TRAFFIC VOLUMES (INTERIM)



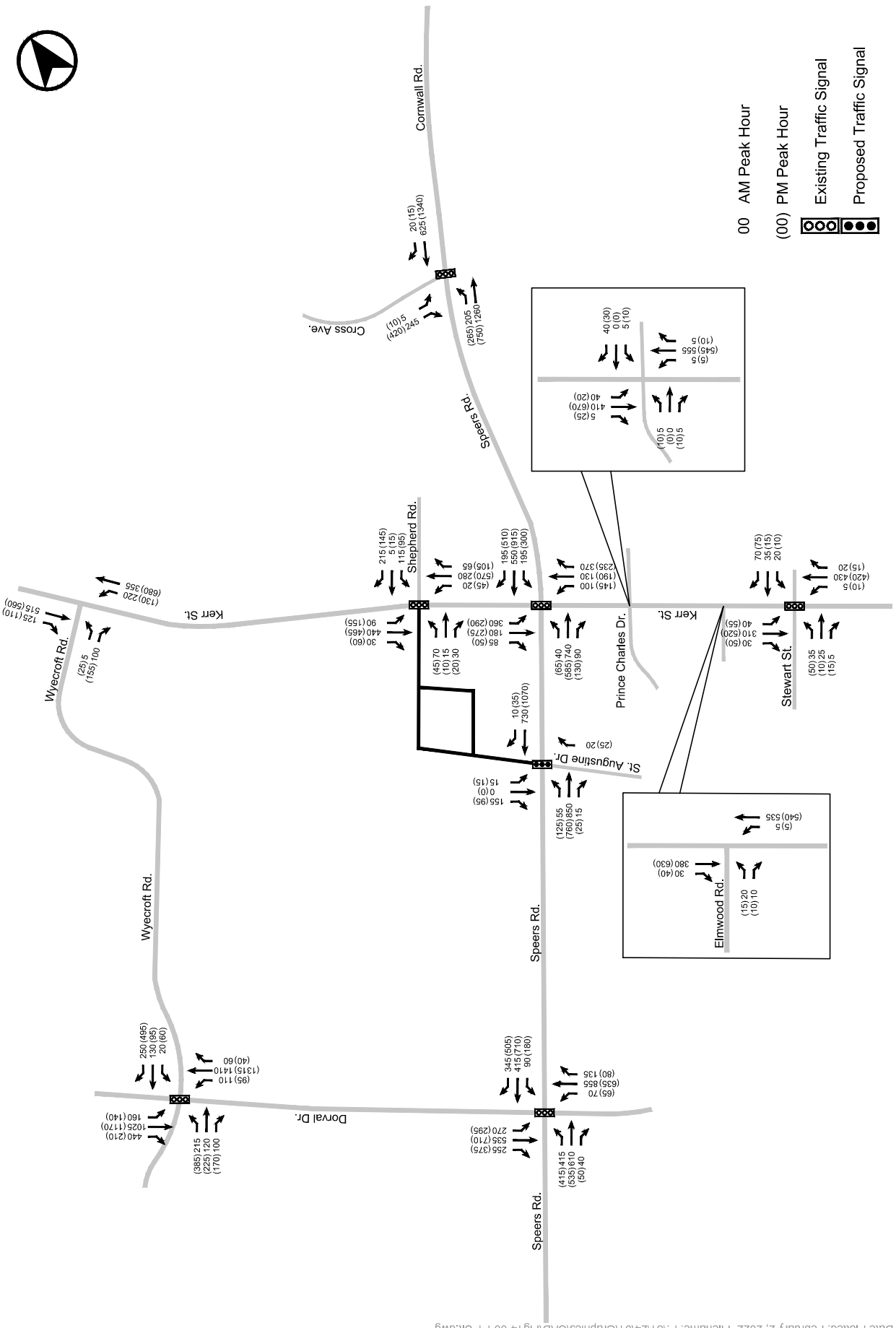
Date Plotted: February 2, 2022 File name: P:\8124\01\Graphics\CAD\Fig12-00-NNST-Ult.dwg

FIGURE 12 NET NEW SITE TRAFFIC VOLUMES (ULTIMATE)



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FIGURE 13 FUTURE TOTAL TRAFFIC VOLUMES (INTERIM)



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FIGURE 14 FUTURE TOTAL TRAFFIC VOLUMES (ULTIMATE)

9.0 PUBLIC STREET NETWORK ANALYSIS SUMMARY

9.1 ANALYSES PARAMETERS

The Synchro analyses conducted herein adopt standard Synchro analyses default parameters.

9.2 SIGNALIZED INTERSECTION ANALYSES

All study area signalized intersections operate within their capacities under all scenarios analyzed.

This includes both the Interim Scenario (i.e., no redevelopment on the 171 Speers Road lands) which does not extend St. Augustine north of Speers Road. The Interim condition assumes a private street connection from within the Subject Site to Speers Road that would operate under right-in/right-out unsignalized conditions. The extension of Shepherd Road west of Kerr Street forms part of this scenario. Shepherd and Kerr would be designed as a signalized intersection per the Rail Grade Separation alignment design plans.

The Ultimate scenario analyzed adopts the extension of St. Augustine Drive north of Speers Road to form a continuous public street between Kerr Street (opposite Shepherd Road) and Speers Road, where both “ends” of this new public street would be signalized.

The recommended lane configurations and public street improvements identified in the 2009 Kerr Village Transportation Assessment, the 2009 Speers Road Environmental Study Report, the Kerr Street Grade Separation Proposed Road Improvements and the proposed Draft OPA provisions (within the Subject Site are sufficient to accommodate the development intensification associated with the Draft OPA provisions.

One “sensitivity” test that was conducted included the introduction of a northbound right turn lane on Dorval at Speers that was identified in the 2009 Kerr Village Transportation Assessment. This added improvement – which is not identified in the 2009 Speers Road Environmental Study Report, offers a relatively significant benefit to the over all operating conditions associated with this intersection; i.e., about a 10 percent improvement in overall operating benefits. This improvement would appear to be able to be implemented within the existing Dorval right-of-way – according to a preliminary sketch provided in the 2009 Kerr Village Transportation Assessment. Based upon a more detailed functional design exercise, it could be confirmed whether this improvement would require any 3rd party lands.

At this juncture, it is recommended that the northbound right turn on Dorval at Speers Road be carried further for functional design review and costing to improve the overall Speers and Dorval corridors operating characteristics and mitigate any future impacts at the Dorval and Speers signalized intersection.

All other improvements identified in the 2009 Kerr Village Transportation Assessment, the 2009 Speers Road Environmental Study Report and the Kerr Street Grade Separation Proposed Road Improvements should be implemented per prior recommendations.

A summary of signalized intersection capacity analyses indices and corresponding queues are presented in **Appendix I**.

9.3 UNSIGNALIZED INTERSECTION ANALYSES

In general, the intersections that would remain unsignalized into the future (Shepherd /Kerr and Speers/St. Augustine would be converted to signalized intersections in the future) will operate under reasonable good conditions.

The Kerr Street / Wyecroft Road unsignalized intersection will start to show signs of longer delays as development traffic balances the option of using Wyecroft Road as an alternate to Speers Road, between Kerr Street and Dorval Road. This intersection should be monitored to determine whether signalization should be implemented. Signals introduced at that Kerr/Wyecroft intersection would operate under reasonably good conditions. The geometric design conditions associated with signalization should be carefully considered given the nature of design vehicles (tractor trailers) using this intersection on a regular basis.

No further modifications are recommended for the unsignalized intersections within the Study Area.

A summary of unsignalized intersection capacity analyses indices is also presented in **Appendix I**.

10.0 PUBLIC STREET NETWORK ANALYSES SUMMARY – KERR STREET UNDERPASS DEFERRAL CONDITION

10.1 OVERVIEW

A recent announcement from Metrolinx indicated that the proposed Kerr Street Underpass project that had been approved after having conducted an Environmental Assessment Study, has been indefinitely deferred. The reasons cited for the deferral relate to the forecast cost escalations of the project.

As part of the design exercise resulting from the Environmental Assessment process, a 30% set of design plans had been prepared that identified the improvements to Kerr Street from Speers Road to Wyecroft Road that would accompany the grade separation between the adjacent Metrolinx rail corridor and Kerr Street.

As a result of the Underpass design that had been prepared, Metrolinx expropriated the necessary lands required to accommodate the Underpass project from the Subject Site land owners, including both fee simple and temporary easement interests. The temporary easement interests were taken by Metrolinx to facilitate the actual construction process associated with the Underpass Project and the improvements to Kerr Street.

As a result of the indefinite deferral of the Underpass project, the Town of Oakville has requested that additional analyses be reported upon to address certain potential impacts on the OPA lands in question. The correspondence from the Town staff is contained in **Appendix A**. The request for additional analyses identified the following 4 scenarios to be reviewed:

1. Grade separation in place by 2031
2. Grade separation and associated road widening, intersection improvements, turning lanes, and active transportation infrastructure deferred beyond 2031 and 2036
3. Grade separation deferred beyond 2031 and 2036 but other transportation improvements and signal timing changes are in place. Required infrastructure improvements to support the proposed development to be identified through the TIS.
4. Level crossing is closed and there is no through access along Kerr Street across the existing level crossing.

10.2 OVERVIEW OF ANALYSIS SCENARIOS REVIEWED

10.2.1 Scenario #1 – Kerr Street Underpass In Place by 2031:

An overview of the first scenarios represents the analyses conducted and reported upon in Section 8.0 of this report.

10.2.2 Scenarios #2 and #3 – Kerr Street Underpass Deferral Condition:

The 2nd and 3rd scenarios differ only in their assumptions associated with the improvements that may or may not be implemented in light of the Underpass project deferral. In other words, would there be any impacts to what may be able to be developed on the OPA lands, which are already impacted by virtue of the expropriations, if there were corresponding delays to the improvements along Kerr Street or along Speers Road and the Underpass deferral.

On this issue, the improvements along Speers Road could still be implemented with the deferral of the Underpass project. There would have to be modifications made to where the Speers Road improvements “tied back into Kerr Street”, but the resulting intersection could function with the “existing” Kerr Street alignment at an improved Speers Road. Therefore, based upon the outcome of the supporting EA for the Speers Road corridor, the Speers Road improvements, as identified in the supporting EA report, have been assumed to be required and would be implemented with or without the intensification proposed in the Draft OPA.

As a result, the analyses undertaken to address the Scenario 2 and 3 above, were collapsed into one scenario which tested a “without” and “with” Kerr Street set of improvements (i.e., Dual SB Left turn lanes) along with assumed development levels on the OPA lands.

The analyses of the Underpass Deferral scenario considered two levels of development intensity on the OPA Lands. These development scenarios were premised upon the following key assumptions:

- the impacts to the developable area within the OPA lands having taking into account the expropriation lands that are now owned by/impacted by Metrolinx and, therefore, not available to developed upon; and,
- lands that have been identified by Metrolinx, beyond the expropriated lands, which are required for the implementation of the Underpass project and Kerr Street improvements and, therefore, also not available to be developed upon.

These two conditions were reviewed by USI and development phasing conditions were established which were incremental development scenarios (i.e., consistent with) the Interim and Ultimate development scenarios considered in the review of the OPA lands. As noted in earlier sections of this report and in the USI planning reports, the Interim development scenario considered the development intensity acknowledging that the 171 Speers Road property may not develop along with the properties associated with 588 Kerr Street, 550 Kerr Street and 530 Kerr/131 Speers Road. The Ultimate development scenario considered the development of the entire OPA lands.

The two phasing scenarios associated with the Kerr Street Underpass deferral condition include the following characteristics:

- Phase 1 - Kerr Street Underpass Deferral Condition:
 - Development properties: 588 Kerr Street, 550 Kerr Street and 530 Kerr/131 Speers Road are considered for development;
 - The demonstration plan associated with the full OPA build out condition was reviewed and only those portions of the above noted properties that could be reasonably developed given the two key assumptions on developable land limitations were identified as within the Phase 1 context;
 - This included a total of 688 residential units and a total of 2,339 square metres of retail GFA. This is spread across the 3 properties noted above.
 - The extent of this Phase 1 development scenario is summarized in tabular form and schematically illustrated and in **Figure 15** below.

- Phase 2 - Kerr Street Underpass Deferral Condition:
 - Development properties: 588 Kerr Street, 550 Kerr Street and 530 Kerr/131 Speers Road and 171 Speers Road are considered for development;
 - The demonstration plan associated with the full OPA build out condition was reviewed and only those portions of the above noted properties that could be reasonably developed given the two key assumptions on developable land limitations were identified as within the Phase 1 context;
 - This included a total of 1,158 residential units and a total of 3,319 square metres of retail GFA. This is spread across the 4 properties noted above.
 - The extent of this Phase 2 development scenario is summarized in tabular form and schematically illustrated and in **Figure 15** below.

Trip generation characteristics associated with both Phase 1 and Phase 2 development conditions are summarized in **Table 11**.

The access assumptions adopted for the Kerr Street Underpass Deferral scenarios included the following:

- Phase 1 - Kerr Street Underpass Deferral Condition
 - One all-movements unsignalized access from Speers Road
 - Approx. 130 m from the centreline of the existing Kerr Street (+/-112 m from the eastbound Stop Bar on Speers Road at Ker Street) and approx. 100 metres west of St. Augustine Drive;
 - This is approximately 45 metres further west than the easterly existing all-movements driveway access to the existing shopping centre on the OPA lands today;
 - This would make use of the Private Street described in the Interim Condition originally reviewed in BA Group's February 2022 TIS;
 - This Private Street would serve all buildings developed as part of a Phase 1 scenario and would be capable of accommodating all design vehicles and Emergency Services vehicles;
 - A temporary connection between the N-S Private street and Kerr Street could be implemented and staged to respond to the Kerr Street Underpass construction conditions.
 - All buildings that would be developed as part of the Phase 1 scenario would be configured with their requisite Site Plan access driveways, loading areas, underground parking access and active transportation elements such that they would not need to be further altered during subsequent phases of development (this ensures that the operations of the Site buildings would be continuous through subsequent development phases)
- Phase 2 - Kerr Street Underpass Deferral Condition
 - Under Phase 2 conditions and the introduction of the 171 Speers Road property, a second point of access would be introduced as the St. Augustine Drive extension into the OPA lands.
 - At this point in time, the Private Street connection introduced in Phase 1 would revert to a Right-in/Right-out connection on Speers Road.

- The resulting street network supporting the Phase 2 development levels would be a continuous inverted-U shaped combination of a Public Street and a Private Street;
- All development characteristics noted in Phase 1 above would be consistent within Phase 2 (i.e., all buildings would be self-sufficient in terms of access and circulation amongst vehicular and active transportation connections).
- Upon development of the Kerr Street Underpass, the Private Street connection to Speers Road could be terminated as proposed under Ultimate conditions given the introduction of the Shepherd Street extension into the Site and the completion of the development proposed as part of the OPA lands.

Although not analyzed herein, two additional Phases have been identified by USI; referred to as Phases 3 and 4 in the Urban Design Brief. These additional Phases demonstrate the delivery of buildings along Kerr Street when the Kerr Street frontage is able to be developed; i.e., at which time the Kerr Street Underpass and related improvements along Kerr Street are completed to the point where development on the west side of Kerr Street could proceed. In part, this is to demonstrate, on a high-level, that the grocery store contemplated for the northwest corner of Kerr Street and Speers Road would have to be delivered during later stages of development.

FIGURE 15: PHASE 1 AND PHASE 2 DEVELOPMENT SCENARIOS – KERR STREET UNDERPASS DEFERRAL CONDITION

Phase 1 Development Scenario – Kerr Street Underpass Deferral Scenario

	Retail GFA (sq m)	Residential GFA (sq m)	Above Grade Parking	Total GFA (sq m)	# of Units	Net Floor Area (sq m)	Site Area	FSI
588 Kerr (AREA A)	400	17,394	0	17,794	187	15,125	9,058	1.67
550 Kerr (AREA B)	397	16,667	0	17,064	183	14,505	8,017	1.81
530 Kerr + 131 Speers (AREA C)	1,542	29,491	0	31,033	317	26,378	12,398	2.13
171 Speers (AREA D)	0	0	0	0	0	0	18,845	0.00
TOTAL	2,339	63,552	0	65,891	688	56,007	48,318	1.16

NOTE: Net Floor Area: 15% floor area for core, stairs, amenities, lobbies and services.



Phase 2 Development Scenario – Kerr Street Underpass Deferral Scenario

	Retail GFA (sq m)	Residential GFA (sq m)	Above Grade Parking	Total GFA (sq m)	# of Units	Net Floor Area (sq m)	Site Area	FSI
588 Kerr (AREA A)	400	17,394	0	17,794	187	15,125	9,058	1.67
550 Kerr (AREA B)	397	16,667	0	17,064	183	14,505	8,017	1.81
530 Kerr + 131 Speers (AREA C)	1,542	29,491	0	31,033	317	26,378	12,398	2.13
171 Speers (AREA D)	980	43,710	4,278	48,968	470	41,623	18,845	2.21
TOTAL	3,319	107,262	4,278	114,858	1,158	97,630	48,318	2.02

NOTE: Net Floor Area: 15% floor area for core, stairs, amenities, lobbies and services.



In addition to the improvements assumptions and the development intensity assumptions noted above, BA Group also conducted direct field measurements of existing train crossings along the Metrolinx rail corridor at Kerr Street in April of 2022, during peak periods of the morning and afternoon weekday conditions. This was done to determine the impact a train crossing has upon the traffic flow characteristics along Kerr Street and so that increases in rail activity could be appropriately modelled for future conditions. The frequency of train crossings and the duration of the “gates down” impacts were noted. This data was converted into a capacity equivalent (a ‘volume to capacity’ measure of the at-grade rail crossing) to assess the relative impacts of increasing rail frequency on the operating conditions along Kerr Street under future conditions.

In order to assess the capacity implications of added rail activity, the existing train frequency recorded in the field (approximately 6 to 7 two-way GO Rail commuter trains were observed along with 1 VIA train during the morning and afternoon peak hours – resulting in a headway of approximately 7.5 minutes to 8.5 minutes) was increased based upon the GO Rail forecast that commuter trains along the Lake Shore West corridor will increase their frequency to 15 minute, or better, service, two-way, all day. The resulting headways tested range from 3 to 5 minute headways for the future train service. That is between 12 and 20 two-way train movements crossing the at-grade rail crossing during the morning and afternoon peak hours. That is a substantive increase and conservatively high assumption.

The Site traffic volume assignments associated with the Phase 1 and Phase 2 – Kerr Street Underpass Deferral scenarios are illustrated in **Figure 16** and **Figure 17**. The Future Total traffic volume assignments associated with the Phase 1 and Phase 2 – Kerr Street Underpass Deferral scenarios are illustrated in **Figure 18** and **Figure 19**.

10.2.3 Scenario 4 – Kerr Street Underpass Deferral Condition

The last scenario reviewed involved the closure of the Kerr Street at-grade rail crossing, terminating any connection along Kerr Street between the areas south of the Metrolinx rail corridor and north of the rail corridor.

The realization of this scenario would, presumably, involve a decision that the Town of Oakville would make based upon their level of comfort associated with the future conditions associated with the combined operating conditions of Kerr Street along this section and the safety risks associated with maintaining an at-grade rail crossing with increased rail activity and traffic volume activity.

It should be noted that the EA associated with the Kerr Street Underpass project clearly concluded that the underpass was warranted based upon pre-intensification conditions associated with the OPA lands. The deferral by Metrolinx based upon cost considerations has also been made within the context of the risks evaluated in the EA assessment.

The analyses herein does not undertake another risk assessment or exposure index evaluation. The exposure index (the numerical index which, in part, determine the decision to pursue a grade-separation) would, presumably, be just as – if not more so – warranted with increased area traffic volumes associated with intensification of the OPA lands amongst other development projects in the general area.

The existing Kerr Street connection across the Metrolinx rail corridor provides a key municipal link in the overall Town street network as well as within the area Regional network.

The following analyses steps were undertaken in evaluating the possible closure of the Kerr Street at-grade rail crossing scenario:

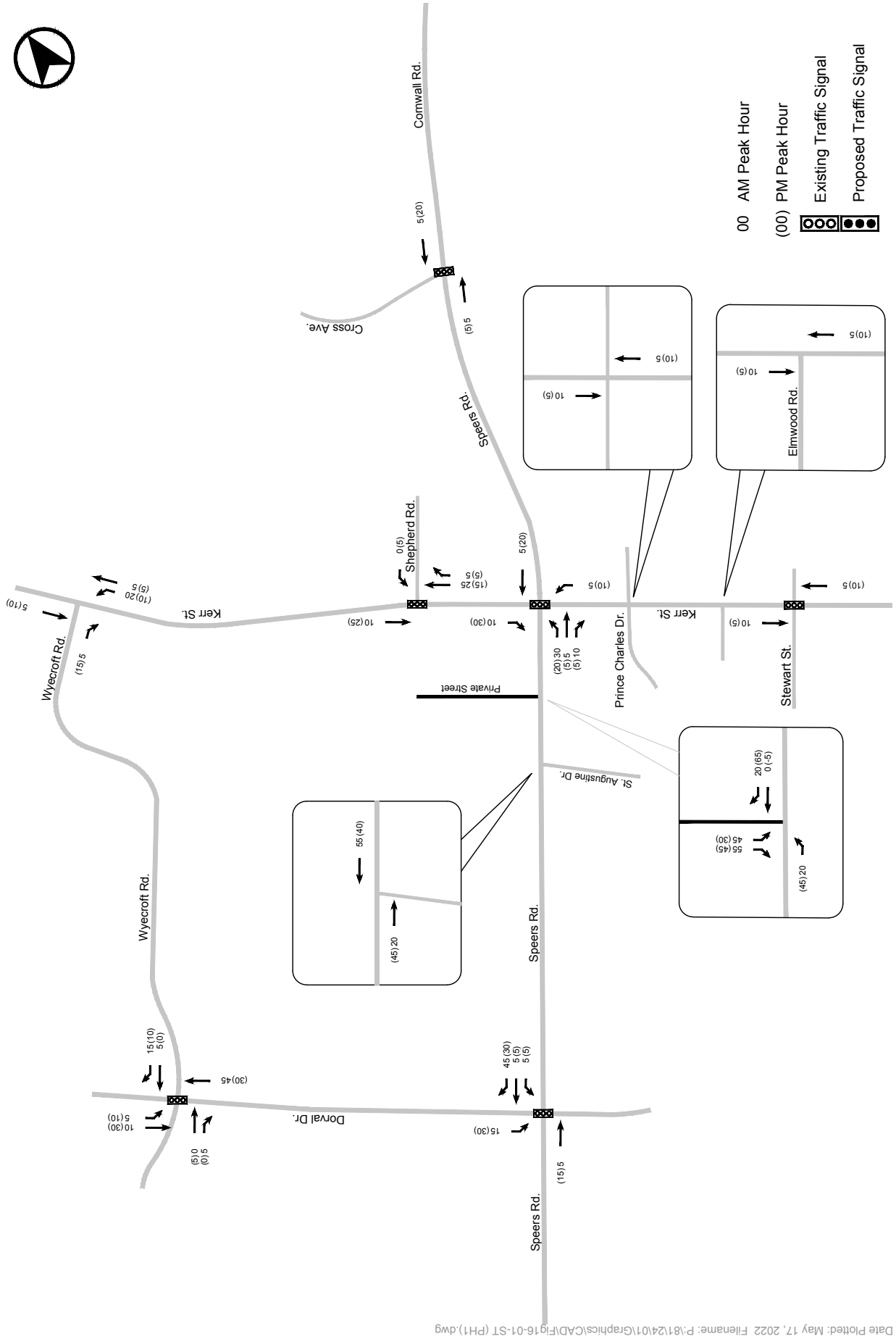
- Base volumes are consistent with those in the prior analyses conducted by BA Group;
- Existing macro traffic patterns in the general vicinity of the Study Area were assessed using “Streetlight Data” (a proprietary data source that uses cell phone tracking on a macro scale to establish traffic and travel patterns). This data can be used to specify particular routes using their Top Routes database and existing turning movement patterns;
- An example of the routing data obtained is provided in the image below (weekday morning peak period patterns). This establishes the base conditions from which rerouting and diversions are generated.
- The existing traffic volumes on Kerr Street were diverted based on the StreetLight’s Top Routes data and existing turning movement patterns.

Streetlight Top Routes Data – sample data - Weekday morning peak period – trips leaving the study area



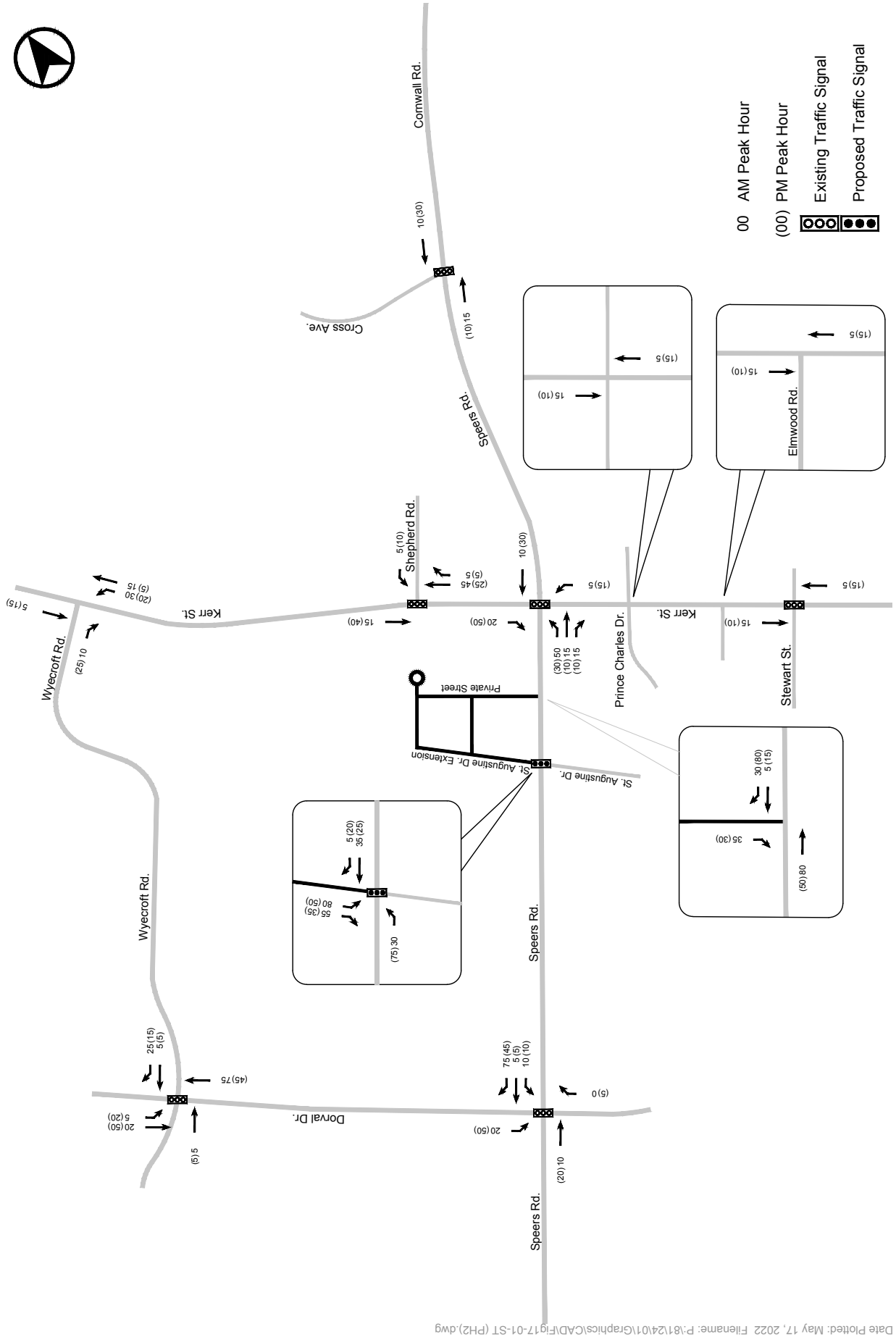
- Traffic volumes are shifted away from Kerr Street to other North-South (Dorval Drive and Trafalgar Road) and east-west corridors (Highway 403, Speers Road and Rebecca St) based on their proportions and direction of approach during the morning and afternoon peak periods.
- The reassignment of existing traffic volumes, future background traffic volumes and Site traffic volumes creates the Future Total traffic volume scenario that is assessed to understand the operational impacts of the Kerr Street at-grade rail closure.
- The Future Total Scenario selected as a representative condition is the Phase 2 –Kerr Street Underpass Deferral condition with the added condition of the rail crossing closure.

The Future Total traffic volume assignments associated with the Phase 2 – Kerr Street Underpass Deferral condition with the added condition of the rail crossing closure scenarios is illustrated in **Figure 20**.



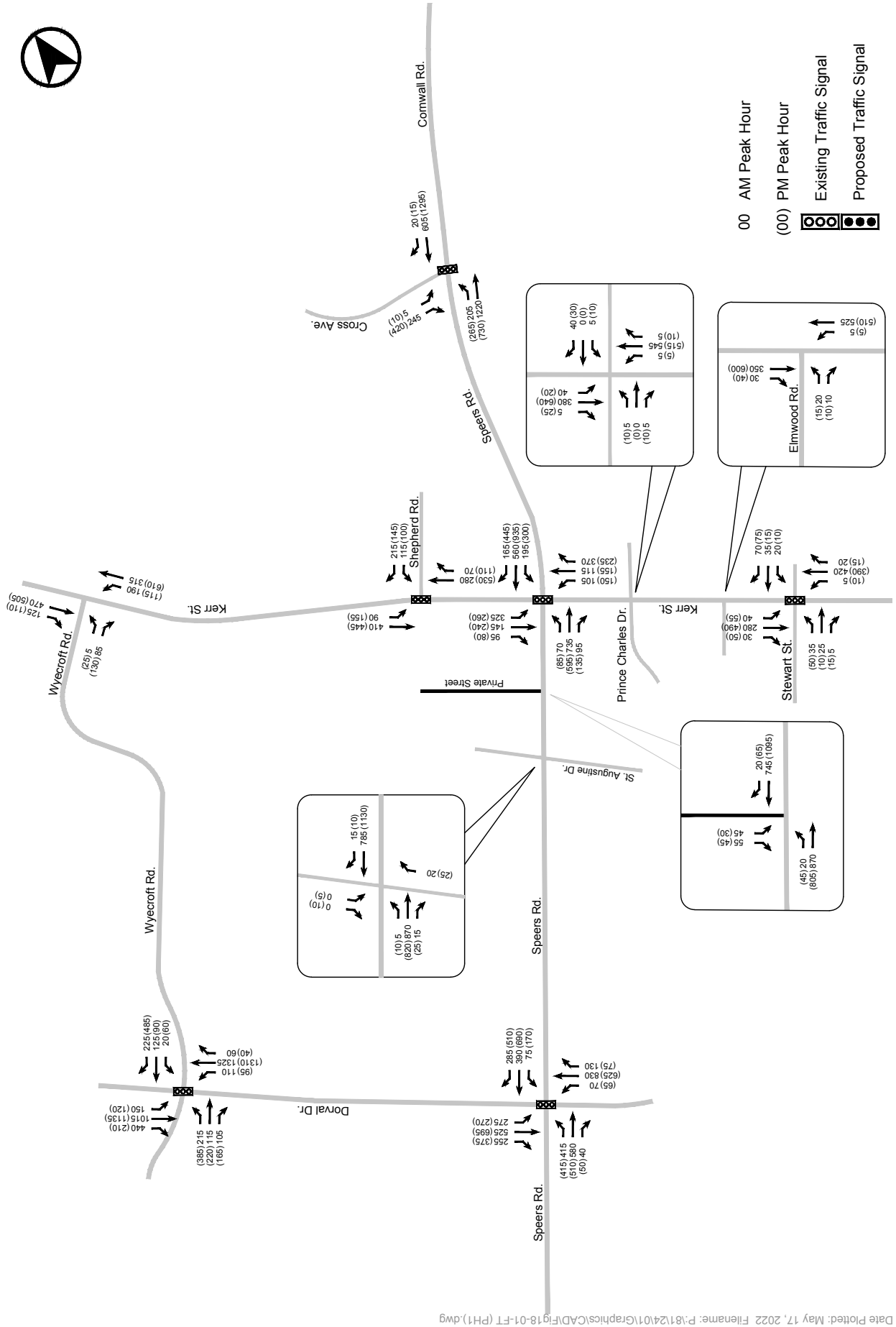
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FIGURE 16 NEW SITE TRAFFIC VOLUMES (PHASE 1) - UNDERPASS DEFERRAL ASSIGNMENT



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FIGURE 17 NEW SITE TRAFFIC VOLUMES (PHASE 2) - UNDERPASS DEFERRAL ASSIGNMENT



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FIGURE 19 FUTURE TOTAL TRAFFIC VOLUMES (PHASE 1) - UNDERPASS DEFERRAL ASSIGNMENT

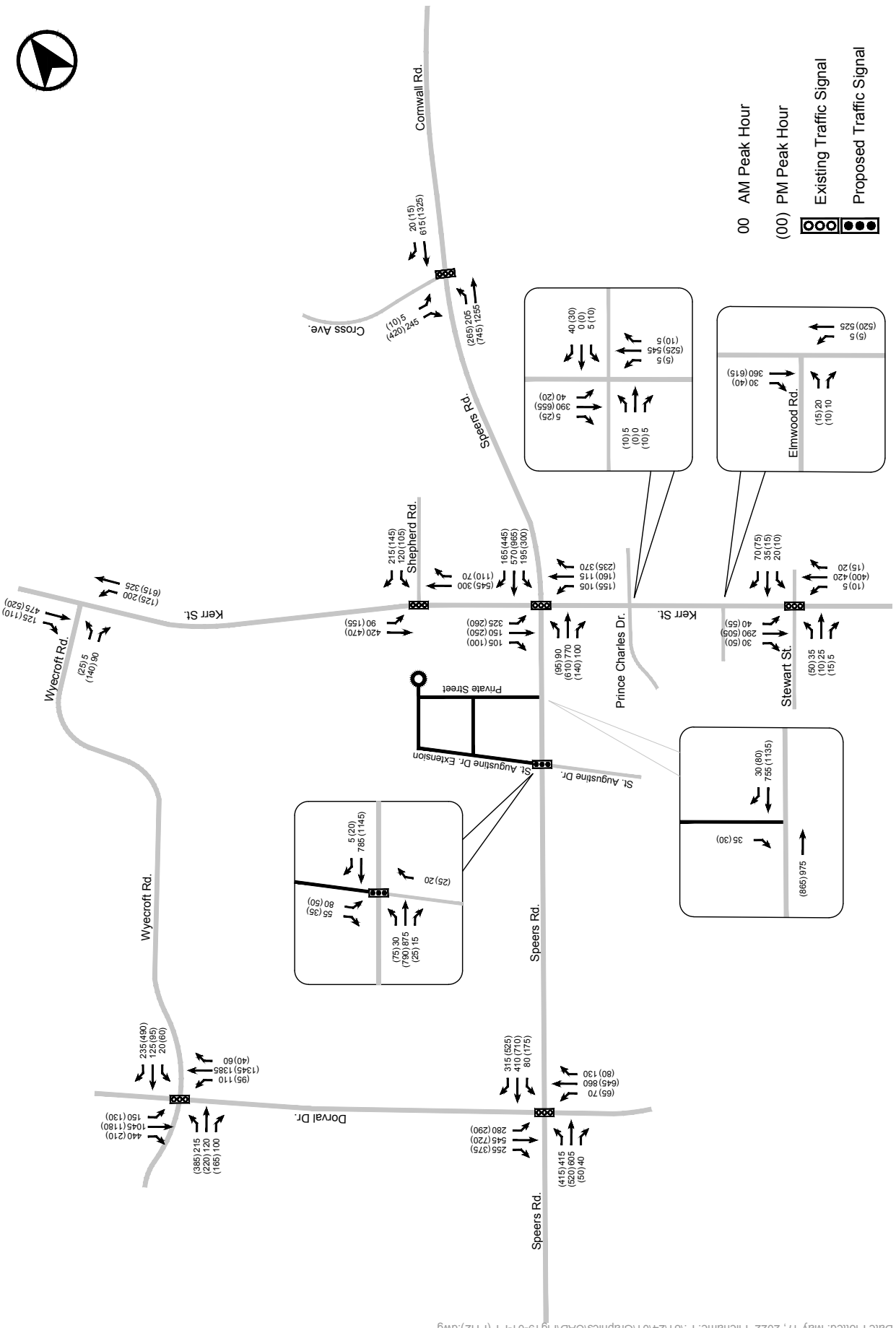
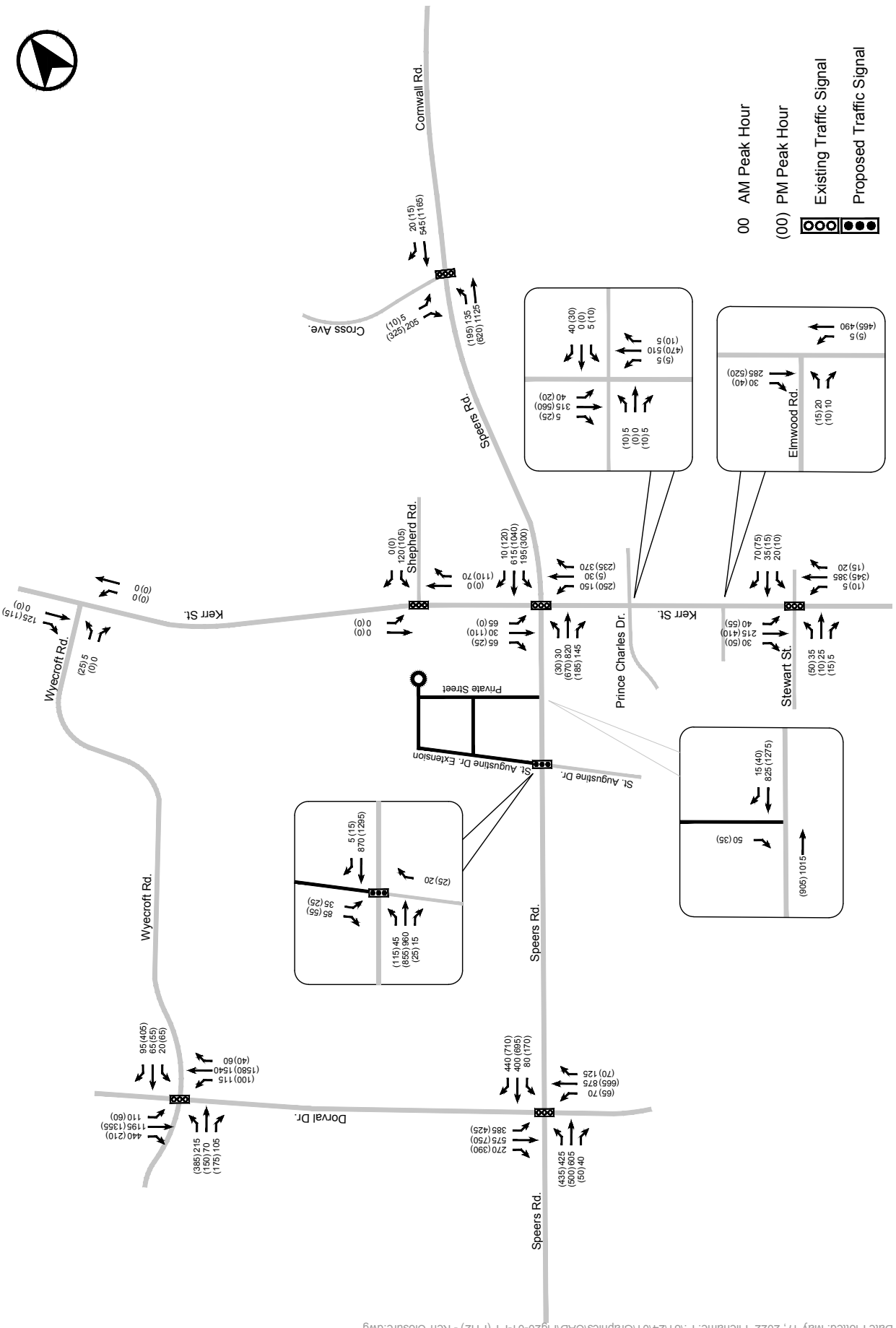


FIGURE 19 FUTURE TOTAL TRAFFIC VOLUMES (PHASE 2) - UNDERPASS DEFERRAL ASSIGNMENT

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Date Plotted: May 17, 2022 Filename: P:\8124\10\Graphics\CAD\Fig20-01-FT (PH2) - Kerr Closure.dwg

FIGURE 20 FUTURE TOTAL TRAFFIC VOLUMES (PHASE 2) - UNDERPASS DEFERRAL AND RAIL CROSSING CLOSURE ASSIGNMENT

10.3 SUMMARY OF FUTURE OPERATING CONDITIONS FOR THE KERR STREET UNDERPASS DEFERRAL SCENARIOS

10.3.1 ANALYSES PARAMETERS

The Synchro analyses conducted herein adopt standard Synchro analyses default parameters similar to the assumptions of the Interim and Ultimate scenarios that included the Kerr Street Underpass condition.

10.3.2 Scenario #1 – Kerr Street Underpass In Place by 2031:

This scenarios represents the analyses conducted and reported upon in Section 9.0 of this report. No further analyses has been undertaken to review this scenario.

10.3.3 Scenarios #2 and #3 – Kerr Street Underpass Deferral Condition

10.3.3.1 INTERSECTION ANALYSES

All study area signalized intersections operate within their capacities under this scenarios under both Phase 1 and Phase 2 development scenarios described above.

This includes both the “without” and the “with” the planned improvements along Kerr Street scenarios.

This also includes the proposed all-movements unsignalized intersection of Speers Road and the Private Street connection under Phase 1 development scenario. This intersection reverts to a right-in/right-out intersection along Speers Road under the Phase 2 development scenario. It is forecast to operate under good conditions during this scenario.

Under this development and access scenario, the at-grade rail crossing on Kerr Street, with the increased train frequency operation allowed for as described above, functions under good capacity-related operating conditions. The forecast queuing that could result from this future at-grade operating condition, however, could extend back from the crossing by somewhere between 100 to 150 metres (about 14 to 21 vehicle queues). At a reasonable discharge rate (i.e., saturation flow value of around 1,500 veh/hr/lane or roughly 2.4 second headway) the queues (depending on the length) would clear the rail crossing after about 33 to 50 seconds after the rail gates were lifted.

The forecast capacity (v/c) and queuing conditions associated with each intersection is summarized in **Appendix I**.

It should be noted that the Phase 1 and Phase 2 development scenarios generate a relatively low amount of Net New traffic when compared to the existing development related traffic generated by the current retail plazas and commercial uses across the OPA Lands. In fact the proposed Phase 1 development levels actually generates significantly less traffic than the existing plaza and commercial uses on the OPA lands today. This is, in part, why the overall operating conditions associated with Phase 1 and Phase 2 development and access scenarios operate as they do across the study area network and at the points of access on Speers Road.

TABLE 16 NET NEW OPA LANDS DEVELOPMENT RELATED TRAFFIC SUMMARY – PHASE 1 AND PHASE 2 – KERR STREET UNDERPASS DEFERRAL SCENARIO

Development Scenario	Morning Peak Hour			Afternoon Peak Hour		
	Inbound	Outbound	Two-way	Inbound	Outbound	Two-way
Total Future Site Traffic – Phase 1	45	95	140	105	70	175
Total Future Site Traffic – Phase 2	70	165	235	160	105	265
Existing Site Traffic – (Phase 1 equivalent lands)	60	35	95	185	200	385
Existing Site Traffic – (Phase 2 equivalent lands)	80	35	115	205	215	420
Net New Future Site Traffic – Phase 1	-15	60	45	-80	-130	-210
Net New Future Site Traffic – Phase 2	-10	130	120	-45	-110	-155

The recommended lane configurations and public street improvements identified in the following documents and analyses are sufficient to accommodate the development intensification associated with the Draft OPA provisions Phase 1 Kerr Street Underpass Deferral conditions:

- 2009 Kerr Village Transportation Assessment;
- the 2009 Speers Road Environmental Study Report (minus the Kerr Street dual southbound left turn lanes); and,
- the northbound right turn on Dorval at Speers Road.

As with the Interim and Ultimate analyses summarized in Section 9.0 of this report, it is recommended that the northbound right turn on Dorval at Speers Road be carried further for functional design review and costing to improve the overall Speers and Dorval corridors operating characteristics and mitigate any future impacts at the Dorval and Speers signalized intersection.

Furthermore, all other improvements identified in the 2009 Kerr Village Transportation Assessment, the 2009 Speers Road Environmental Study Report (minus the Kerr Street dual southbound left turn lanes) and the Kerr Street Grade Separation Proposed Road Improvements should be implemented per prior recommendations to support the Phase 1 and Phase 2 development and access conditions.

In general, the intersections that would remain unsignalized into the future will operate under reasonable good conditions. This includes the Phase 1 access from Speers Road at the Private Street. Level-of-Service of between A and C are forecast. Queuing on Speers Road EB at Kerr would typically not extend back to the Private Street location. Given the existing (and planned) centre median lane, traffic entering the Phase 1 development from the west would have this lane open to them as would traffic exiting the Phase 1 lands to the east (SB left); the SB Left traffic movements could complete a 2-stage outbound manoeuvre to join the EB

flow of traffic. The EB left turn queue at Kerr Street is not forecast to pose any issue in this regard (the local demand for that movement would be reduced with the redevelopment of the OPA Lands).

The Kerr Street / Wyecroft Road unsignalized intersection will start to show signs of longer delays into the future. This intersection should be monitored to determine whether signalization should be implemented. Signals introduced at that Kerr/Wyecroft intersection would operate under reasonably good conditions. The geometric design conditions associated with signalization should be carefully considered given the nature of design vehicles (tractor trailers) using this intersection on a regular basis. Capacity analysis worksheets are contained in **Appendix J**.

10.3.4 Scenario #4 - Kerr Street Underpass Deferral Condition

This scenario adopts the assumption that the Kerr Street at-grade rail crossing would be closed given the indefinite deferral of the Kerr Street Underpass project.

In this option, the study area network, has had the following traffic redistributed and diverted across the network resulting from the closure of the Kerr Street at-grade rail crossing:

- general area existing traffic;
- future non-OPA lands area development traffic; and,
- proposed Phase 2 development level traffic volumes.

The impacts of these traffic diversions generally results in a less efficient, a less flexible and places under capacity-constrained conditions on the study area network and particularly at the regional intersection of Dorval and Speers. The expected movements (SB left turn and WB right turn) would experience significantly higher capacity constrained and queuing conditions. These movements would be the logical movements upon which the traffic that would have used the Kerr Street corridor would shift to accomplish similar regional routing patterns.

Kerr Street, north of Speers Road begins to operate as a local street and as an extension of Shepherd Road. It no longer serves as an effective supporting Major Transportation Corridor, as set out in the Town of Oakville's Livable Oakville Urban Structure. Its role providing strategic connections within the Town of Oakville to other Major Transportation Corridors and to Regional Roads would be eliminated.

It would put unnecessary operating pressure on other major corridors in the Town and Region and would cease to provide the balance that is afforded the public street network in the Upper Kerr Village area and the Mid-Town area. Kerr Street would lose the strategic advantages it currently provides.

Closure of the Kerr Street at-grade rail crossing prior to the Kerr Street Underpass project being implemented would also negatively impact the ability for the study area street network to adequately accommodate the planned intensification within the Upper Kerr Village according to the provisions set out in the proposed Draft OPA. Although the intersections in the immediate vicinity of the OPA Lands would continue to operate under acceptable conditions, the reliance on the Regional Road system at Dorval would be compromised.

The capacity implications of this scenario involving the closure of the Kerr Street at-grade rail crossing are illustrated in **Appendix I**. Given the operating characteristics associated with the Kerr Street at-grade rail

crossing under similar development intensity conditions (i.e., Phase 2 – Kerr Street Underpass Deferral scenario with the at-grade rail crossing operational), it is not recommended that the at-grade rail crossing be closed if/when development is phased across the Draft OPA lands. Capacity analysis worksheets are contained in **Appendix J**.

Queuing conditions across the study area network would also reflect reasonable urban operating conditions

As noted in **Section 10.2.3** above, this analyses does not assess the “risk” issue involving the at-grade crossing or its continued operation with elevated volumes of train frequency and vehicular traffic. It has evaluated the operating capacity of the at-grade rail crossing and found that there is capacity remaining at the crossing with allowances for increased train frequency and increased vehicular volumes. The operating conditions – capacity and queuing – appear to be manageable into the foreseeable future (phase 2 horizon of 2036) with the at-grade crossing remaining operational.

11.0 SUMMARY AND CONCLUSIONS

Overview

BA Group has been retained by Urban Strategies Inc. to prepare a transportation impact assessment (TIA) on behalf of April Investments Limited (owner of 588 Kerr Street), 527079 Ontario Limited (owner of 530 Kerr Street), Trans County Development Corporation Limited (owner of 131 Speers Road), and Oakville Developments (2010) Inc. (owner of 550 Kerr Street) (together known as the “landowners”). BA Group prepared a report entitled “*Upper Kerr Village, Part 2 Transportation Assessment – Official Plan Amendment – Transportation Considerations Report*”, dated February 2 2022 (referred to herein as the February 2022 TIS Report). That report supported an Official Plan Amendment (OPA) to permit the redevelopment and intensification of lands municipally addressed 530, 550 and 580 Kerr Street, 131 and 171 Speers Road (together know as the “Subject Site” and that forms a portion of what is referred to as the Upper Kerr Village District) in the Town of Oakville (the “Town”), Halton Region (the “Region”).

Since the February 2022 TIS submission, preliminary comments on the February 2022 TIS submission from the Town of Oakville have been received and an announcement by Metrolinx that the Kerr Street Underpass project has been indefinitely deferred has been made.

In response to these two developments, a revised May 2022 TIS report has been prepared. This May 2022 Revised TIS Report incorporates responses to the Town’s preliminary comments and the implications of the deferred Kerr Street Underpass project on the OPA.

The portion of the Upper Kerr Village District that forms the subject OPA (referred to herein as the Subject Site) is bounded by Speers Road on the south, Kerr Street on the east, the CN Rail corridor on the north, and the west limit of the property known municipally as 171 Speers Road. The owners of the property at 171 Speers Road are not a direct party to the OPA submission; however, further to Official Plan policies, their lands have been considered in the Comprehensive Development Plan (Proposal) and its proposed future development structure.

The Comprehensive Development Plan and implementing OPA will permit the intensification of the Subject Site. The intensification characteristics are set out in the Draft OPA and associated Schedules.

The Draft OPA and proposed Comprehensive Development Plan is consistent with and conforms to provincial, regional and municipal policies by planning to:

- minimize the number of vehicle trips;
- support the development of viable choices and plans for public transit and other alternative transportation modes;
- provide connectivity amongst modes of transportation as well as a balance of modal choices for users of the system; and,

- be pedestrian and cycling oriented, providing improved connectivity to transit and the Oakville GO Station in Mid-Town.

The Draft OPA provisions incorporate the goals, objectives and policies set out in Part E – Growth Areas, Special Policy Areas and Exceptions, Kerr Village (See **Appendix C**) when establishing the intensification parameters for the overall Block and individual properties.

Part 1 of the complete set of transportation assessments was provided to the Town of Oakville in November 2021. It was a part of the support for the Comprehensive Development Plan and Draft OPA provisions. Part 1 was a high-level overview of the transportation considerations relevant to the Subject Site. This May 2022 TIS report updates the Part 2 Transportation Assessment from February 2022 (incorporating Part 1) and considers the implications of the associated intensification of the Subject Site in detail, responds to preliminary comments from the Town of Oakville Transportation Department, provides an analyses of the Kerr Street Underpass Deferral options as request by the Town of Oakville and provides an analytical assessment of the travel demands, impacts, and mitigation measures, if any, required to support the Draft OPA provisions.

Existing Site Context

- The Subject Site currently exhibits a range of retail, personal business, entertainment and institutional uses.
- The 171 Speers Road property includes an existing cinema use and what was a mixture of retail businesses, personal service businesses and institutional uses (adult learning centre).
- The balance of the Subject Site (i.e., 131 Speers and 530 Kerr, 550 Kerr and 588 Kerr) operates like a homogeneous retail plaza with what is configured as retail gross floor area (GFA) situated along the west side of the Subject Site, service areas on the west side of the retail GFA and a conventional shared parking area between the retail GFA and Kerr Street.
- In total the existing GFA associated with each of the properties include:
 - The 171 Speers Road property is approximately 4,700 square metres (50,600 square feet) of GFA.
 - 131 Speers and 530 Kerr, 550 Kerr and 588 Kerr has approximately 11,724 square metres (126,200 square feet) of GFA.
 - The total existing commercial GFA across the Subject Site is approximately 16,424 square metres (176,800 square feet) of GFA.
- The approved grade separation of Kerr Street and the CN Rail corridor will have the effect of shifting the horizontal alignment of Kerr Street to the west starting approximately half way between Speers Road and Shepherd Road and extending north beneath the CN Rail corridor where it rejoins the existing alignment of Kerr approximately half way between the CN Rail corridor and Wycroft Road.
 - This realignment will reduce the future developable lands on a portion of the Subject Site.
 - It will also reconfigure access to the Subject Site (the portion including 131 Speers and 530 Kerr, 550 Kerr and 588 Kerr) in such a way that the existing northerly unsignalized access driveway would get eliminated and replace with a signalized access opposite Shepherd Road.

- From a mobility perspective, the surrounding areas offer a diverse set of destinations and relationships that would support intensification within the Subject Site.
- The Subject Site is also conveniently located proximate to the Queen Elizabeth Way (QEW) / Highway 403 corridor, linking the Upper Kerr Village Growth Area with destinations east (the Greater Toronto Area) and west (Greater Hamilton Area) of Oakville.
- Indefinite deferral of the Kerr Street Underpass Project, along with the fact that lands have already been expropriated for this purpose, would have the effect restricting development across portions of the 131 Speers and 530 Kerr, 550 Kerr and 588 Kerr properties to varying degrees in order to make provision for the eventual implementation of the Underpass, related Kerr Street improvements and the construction activities required to building the Underpass project and Kerr Street improvements.

Draft OPA and Comprehensive Development Plan

- The Draft OPA for the Subject Site will permit approximately 192,000 square metres of total GFA. This breaks down into approximately 171,300 square metres of residential GFA, 7,915 square metres of retail GFA and 12,720 square metres of above grade parking.
- For the purposes of the transportation assessment this translates into approximately 1,850 residential units.
- The Comprehensive Development Plan for the Subject Site as contemplated within the Draft OPA makes provision for the retention of retail uses along Kerr, Speers and Shepherd with a potential grocery store planned as the corner of Speers Road and Kerr Street.
- The urban structure of the Draft OPA also allows for appropriate accessibility providing important support for the retail viability.
- The Draft OPA also includes important policies relevant to Streets and Parking - Subsections i., ii, iii and iv appropriately address the public street extensions of Shepherd and St. Augustine Drive, the introduction of a private local street within the Subject Site, appropriate vehicular parking reduction provisions and the ability to park vehicles below-grade beneath the proposed public park and private street, respectively.
- Furthermore, in light of the Kerr Street Underpass Deferral, additional phasing scenarios associated with the OPA lands have been developed to enable development to incrementally proceed. These include:
 - Phase 1 – 688 residential units and approximately 2,339 square metres of retail Gross Floor Area (GFA) across only the 131 Speers and 530 Kerr, 550 Kerr and 588 Kerr properties; and,
 - Phase 2 – 1,158 residential units and approximately 3,319 square metres of retail Gross Floor Area (GFA) across all properties in the OPA Lands; i.e., the 131 Speers and 530 Kerr, 550 Kerr, 588 Kerr and the 171 Speers Road properties.
 - These phasing options maximize the developable lands available under the Kerr Street Underpass Deferral conditions.

Area Transportation Networks

- Public Street Network
 - Both Speers Road and Kerr Street are Town of Oakville streets and both are 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.
 - As part of the 2009 Kerr Village Transportation Assessment and the 2009 Speers Road Environmental Study Report, improvements in the immediate vicinity of the Upper Kerr Village area were identified for implementation in conjunction with development (intensification) within the Kerr Village Growth Area. These improvements were identified within the context of the planned intensification associated with the overall Kerr Village Growth Area circa 2009.
 - Kerr Street - given the grade separation planned for Kerr Street, Kerr will have two through lanes in each direction plus left & right turn lanes at a new signalized intersection at Shepherd;
 - 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;
 - Speers Road was identified as requiring an eastbound right turn lane in addition to the current lane configurations; and,
 - Speers Road was identified as requiring bicycle lanes along its length –to east of Kerr Street.
- 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)
- The Shepherd Road and St. Augustine Drive extensions – through the Comprehensive Development plan area – will augment the existing public street system by linking Kerr Street and Speers Road and offering both intensification related vehicular traffic as well existing corridor related traffic volumes relief from existing busy junctions in the immediate area.
- Public Transit Network
 - The Subject Site are at the convergence of 5 Oakville Transit routes that all lead to the Oakville GO Station.
 - Combined headways of all 5 routes producing effective headways that result in 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 for convenient transfers.
 - 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.

- An accessible transit service called care-A-van provides door-to-door transportation for persons with disabilities. Anyone unable to use conventional transit service due to their disability is eligible to apply. The service operates within Oakville Transit’s operation hours and is available 7 days a week.
- The existing public transit and future enhanced public transit systems will play a significant role in meeting the travel needs of Kerr Village based upon the planned intensification.
- Speers Road is considered a Regional Transit Corridor; and,
- The Upper Kerr Village area is less than 1 kilometre from the Mid-Town area and the Oakville GO Transit Hub.
- Active Transportation Networks
 - All area public streets have sidewalks provided on both sides of the streets.
 - There are no existing dedicated cycling facilities along either Speers or Kerr corridors.
 - Both Speers (buffered Bike Lanes) and Kerr (Bike Lanes from Speers to the north) and Shepherd Road (Bike Lanes to the south) are identified to have dedicated cycling facilities along their lengths.
 - Active transportation facilities will offer connections through the Town and to key daily destinations. These types of facilities assist in providing the “first mile / last mile” facilities that support and encourage non-auto modes of travel for commuting and for daily trip making.

Planning Policy Compliance and Technical Support

- Policy support for the Comprehensive Development Plan and Implementing Draft OPA has broad support at various levels of governance including the Provincial Policy Statement and the Growth Plan, the Town of Oakville’s Official Plan, Livable Oakville
- In the Town’s Official Plan, The Upper Kerr Village District is identified as a Growth Area and envisioned as a higher density, transit-supportive, mixed use area.
- The Transportation Assessment herein uses prior supporting technical documents as the basis of comparison for assessing what if any additional mobility improvements are required to accommodate the proposed Comprehensive Development Plan and the Implementing Draft OPA.

Review of Draft OPA Development Context

A review of the proposed Comprehensive Development Plan and implementing Draft OPA including the relevant sections of policy and planning documents identified was undertaken.

- Site Plan Scale of Review
 - At the “Site Plan” scale, the Draft OPA policies and its schedules reflect considerable flexibility to achieve appropriately configured accessibility for pedestrians, cyclists and motor vehicles including Emergency vehicle access and circulation.

- The existing/proposed transportation network – including the existing/planned arterial/collector public street system, the proposed Upper Kerr Village public / private Local street network, the existing/planned public transit network, and the planned active transportation network systems – can appropriately support the development levels proposed in the Comprehensive Development Plan.
- The supply of bicycle parking and vehicular parking will be appropriately scaled to support the non-vehicular travel modes while providing appropriate levels of mobility for all residents, visitor and employees of the District.
- The broad benefits of the mixed-use nature of the Comprehensive Development Plan will aid in reducing vehicle trips and maximizing non-vehicular modes.
- A comprehensive set of Transportation Demand Management plan elements will be encouraged to become a part of all development within the Upper Kerr Village District.
- Development Phasing Review
 - Development Phasing will be critical from the following perspectives:
 - Coordination of the public and private street infrastructure coincident with the individual development parcels and delivery of the public park (or portions thereof).
 - Given the complexity of such individual development phasing across the Subject Site, phasing plans for each individual development application will need to
 - Demonstrate no adverse impact occurs on the continued operation of remaining existing uses;
 - Demonstrate how the subject development application can be realized without precluding the implementation of the overall development potential outlined in the Comprehensive Development Plan; and,
 - Demonstrate the manner in which infrastructure and parkland will be provided.
 - The 171 Speers Road development parcel is not a direct party to the Draft OPA process, but, nevertheless has been considered in the urban structure, development massing and infrastructure necessary to achieve the Comprehensive Development Plan.
 - A phased implementation of the public and private streets as well as the public park has been considered such that an “Interim” scenario arrangement could be achieved that permits those portions of the Upper Kerr Village district that are located on the 131 Speers and 530 Kerr property, the 550 Kerr property and the 588 Kerr property to move forward with development.
 - A corresponding set of Phasing Scenarios (Phase 1 and Phase 2) have been prepared for the Kerr Street Underpass Deferral conditions as noted above.
 - The existing/proposed transportation network – including the existing/planned arterial/collector public street system, the proposed Upper Kerr Village public / private Local street network, the existing/planned public transit network, and the planned active

transportation network systems – can appropriately support the development levels proposed in the Comprehensive Development Plan under these “Interim” development and Phase 1 and Phase 2 scenarios.

- Local Area Review
 - Assessment of the travel characteristics from an analytical perspective have been assessed in this May 2022 Part 2 Transportation Assessment described Section 8.0 (Ultimate and Interim development conditions with the Kerr Street Underpass project in place) and Section 9.0 (Phase 1 and Phase 2 development scenarios under the Kerr Street Underpass Deferral set of conditions) of this report.
 - Planned Public transit and active transportation facilities will feature accessibility characteristics that are consistent with and supportive of policies from various levels of governance.
 - The planned public and private streets that form the framework of the Comprehensive Development Plan will facilitate the accessibility of the planned intensification within the Upper Kerr Village District and provide a small measure of relief to certain minor movements within the existing public street network.
 - The Transportation Assessment conducted herein reviews these aspects of the proposed public and private street network.
- Regional Area Review
 - From a regional area perspective, the Draft OPA development potential is consistent with the aforementioned planning documents since it maintains a balance between various modes of transportation accessibility – a balance that, as transit initiatives in the area are enhanced, can be shifted in favour of non-auto modes of travel.

Justification of Intensification within Upper Kerr Village

- Upper Kerr Village is a designated secondary Growth Area within the Town of Oakville
- Substantial Municipal/Regional/Provincial mobility infrastructure investment within general vicinity of Upper Kerr Village and within nearby Mid-Town
- Proximity of Upper Kerr Village to existing and planned multi-modal infrastructure
- Intensifying the residential population of Upper Kerr Village will increase and encourage non-auto trip making for commuters and internalized O-D trips.
- Upper Kerr Village is an excellent location to incorporate Reduced Vehicular Parking Rates to reduce auto-based travel:

Vehicular Analyses – Review of Public Street Capacity and Operating conditions

- BA Group has prepared base existing conditions (2021 conditions modified to ensure Covid-19 effects have been eliminated) that reflects a pre-Covid-19 conditions to ensure an appropriate basis of evaluation.
- Background (non- Subject Site) development related and corridor growth allowances have been included to forecast both 2031 and 2036 future conditions;
- The Subject Site's vehicular traffic forecast has been based upon a combination of standard industry related trip generations rates, proxy sites from similar developments in similar environments in the GTA and Oakville as well as considering the existing and forecast modal split conditions in the future scenarios.
- A combination of the existing, background developments and corridor growth and Subject Site vehicular traffic was used as the basis for forecasting operating conditions in the 2031 and 2036 time horizons.
- An "Interim" condition where 171 Speers Road lands are assumed to NOT redevelop; and, an Ultimate Condition (2036) – where the entire Subject Site is assumed to redevelop were analyzed for operating conditions sensitivities.
- In addition, development phasing that took into account the Kerr Street Underpass Deferral conditions (due to a recent Metrolinx announcement on project cost escalation) were also reviewed under two scenarios – Phase 1 (with development only occurring on the 131 Speers and 530 Kerr property, the 550 Kerr property and the 588 Kerr property – which corresponds to the "Interim" development properties above) and Phase 2 (with development occurring on the 131 Speers and 530 Kerr property, the 550 Kerr property, the 588 Kerr property and the 171 Speers Road property – which corresponds to the "Ultimate" development properties above).
- The results of the analyses indicate that all Study Area intersections are forecast to operate under acceptable conditions under both Interim and Ultimate scenarios.
- A similar conclusion was reached when considering the Phase 1 and the Phase 2 scenarios that considered the Kerr Street Underpass Deferral conditions assuming the at-grade rail crossing on Kerr Street remained open during the deferral period.
- Although not analyzed herein, two additional Phases were identified by USI; referred to as Phases 3 and 4 in the Urban Design Brief. These additional Phases demonstrate the delivery of buildings along Kerr Street when the Kerr Street frontage is able to be developed; i.e., at which time the Kerr Street Underpass and related improvements along Kerr Street are completed to the point where development on the west side of Kerr Street could proceed. In part, this is to demonstrate, on a high-level, that the grocery store contemplated for the northwest corner of Kerr Street and Speers Road would have to be delivered during later stages of development.
- If the Kerr Street at-grade rail crossing were to be closed during the Kerr Street Underpass Deferral period, there would both practical and functional constraints placed upon the Study Area public street network; particularly at the Speers Road and Dorval Drive regional signalized intersection. Based

upon the operating conditions – capacity and queuing conditions – there does not appear to be a reason to close the Kerr Street at-grade rail crossing during the Kerr Street Underpass deferral period. This is based upon the operational aspects only. A risk assessment of the at-grade rail crossing under increased trains activity and vehicular volumes has not been carried out as part of this assessment. Presumably, the same or heightened risk conditions would prevail under the Underpass deferral period relative to those conditions that would have been assessed by Metrolinx within the Environmental Assessment that was conducted as part of the Kerr Street Grade Separation project.

- The future study area public street network analyzed includes all recommended improvements outlined in the 2009 Kerr Village Transportation Assessment, the 2009 Speers Road Environmental Study Report and the Kerr Street Grade Separation Proposed Road Improvements. These continue to be recommended to support the Draft OPA intensification provisions.
- It is recommended that the northbound right turn discussed herein on Dorval at Speers Road be carried further for functional design review and costing in order to improve the overall Speers and Dorval corridors' operating characteristics and mitigate any future impacts at the Dorval and Speers signalized intersection.
- For the Kerr Street Underpass Deferral conditions, the future study area public street network analyzed includes all recommended improvements outlined in the 2009 Kerr Village Transportation Assessment, the 2009 Speers Road Environmental Study Report, minus the southbound dual left turn lane and Kerr Street widening conditions along Kerr Street north of Speers Road. These continue to be recommended to support the Draft OPA intensification provisions for Phase 1 and Phase 2 development scenarios.
- It is also recommended that the northbound right turn discussed herein on Dorval at Speers Road be carried further for functional design review and costing in order to improve the overall Speers and Dorval corridors' operating characteristics and mitigate any future impacts at the Dorval and Speers signalized intersection for the Phase 1 and Phase 2 development scenarios.

Overall Conclusion

Based upon the assessment conducted herein, the Proposal and implementing OPA is an appropriate framework for which to base future intensification of the Upper Kerr Village District.

The operational analyses conducted as part of this May 2022 Part 2 Transportation Assessment indicates that the Draft OPA and the proposed Comprehensive Development Plan densities – and supporting street network, TDM and parking provisions – can be reasonably accommodated within the context of the planned public street system and supporting public transit and active transportation systems. Continued emphasis on Active Transportation and Public Transit planning in the Upper Kerr Village area and the Mid-Town area will further improve mobility options afforded to the planned residential and commercial land uses in Upper Kerr Village.

Similarly, under the Kerr Street Underpass Deferral conditions, development phasing of the OPA lands as described herein, can be appropriately accommodated with the recommended public street improvements.

The Draft OPA and proposed Comprehensive Development Plan is consistent with and confirms to provincial, regional and municipal policies by planning to:

- **minimize the number of vehicle trips;**
- **support the development of viable mobility choices and plans for public transit and other alternative transportation modes;**
- **provide connectivity amongst modes of transportation as well as a balance of modal choices for users of the system;**
- **be pedestrian and cycling oriented, providing improved connectivity to transit and the Oakville GO Station;**
- **anticipate the westerly Shepherd Road extension and the northerly extension of St. Augustine Drive or phasing alternatives to same; and ,**
- **allow for development of the Subject Site to occur gradually and over the long-term in a phased manner which coordinates the provision of transportation infrastructure.**

Moreover, the Draft OPA and proposed Comprehensive Development Plan will allow the Upper Kerr District to become a multi-modal – transit and active transportation – supportive mixed-use area.

**APPENDIX A:
Town of Oakville Correspondence – Preliminary Comments on
February 2022 TIS Report and Town Request for Additional
Information on the Impacts of the Kerr Street Underpass
Deferral by Metrolinx**



Timothy J. Arnott

From: Syed Rizvi <syed.rizvi@oakville.ca>
Sent: April 25, 2022 7:31 AM
To: Timothy J. Arnott
Cc: Paul Barrette; Jill Stephen
Subject: RE: Upper Kerr Transportation Analysis - "Kerr Street Underpass - Deferred Indefinitely" Scenario

Hi Tim,

Reference Transportation Impact Study (TIS) submitted in support of OPA application to permit the intensification of Upper Kerr Village lands. The town staff has conducted a preliminary review of the TIS and noticed following deficiencies in Section 7.6 – Site Vehicular Travel Forecasts:

- **Table-4: Residential Units Trip Gen Rate**
 - Site Auto Trips for 1,845 units before applying modal split reduction factor;
 - The number of Auto Trips reduced for each travel mode (Transit, Pedestrian, walk, cyclist) by applying trip reduction factor;
 - Net Auto trip Gen for the Residential land use;
 - The result of the key study area intersections-Queuing Analysis is not reported in the MOE's Tables (Ref Halton Region/Town of Oakville TIS Guidelines)

- **Table-5 Retail Land use**
 - Site Auto Trips for 57,244 sf before applying modal split reduction factor;
 - Net Auto Trips Gen for Retail land use;
 - Reference/justification for 30% pass-by Trips reduction (ITE /Proxy sites);
 - Confirm appropriate LUC for Retail Land use. ITE-LUC 820 Shopping Centre vs ITE- LUC 232 High Rise with Ground Floor Commercial;
 - Justification for applying Multi-Modal trip reduction for Retail land use, and 30% pass-by trips (Total 30+39=69% reduction factor)

A set of sample Vehicular Trip Generation tables are attached below for consideration to use in the next TIS submission.

Please feel free to contact for any questions.

Thanks,
Syed

Table 5.4: 2026 Site Generated Vehicular Trips

Land Use	Basis/Parameter	Vehicle Trips			
		Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
		Inbound	Outbound	Inbound	Outbound
Senior Living Building (80 Units)	ITE Land Use 252 (Senior Adult Housing - Attached) calculated total trips	6	10	12	10
	Non-Auto Trip Reduction	(1)	(2)	(2)	(2)
	Total Senior Living Building vehicle trips	4	8	9	8
Employment Use Building (530,000 ft ²)	ITE Land Use 710 (General Office Building) calculated total trips	456	74	89	466
	Non-Auto Trip Reduction	(96)	(16)	(19)	(98)
	Total Employment Use Building vehicle trips	360	59	70	368

Land Use	Basis/Parameter	Vehicle Trips			
		Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
		Inbound	Outbound	Inbound	Outbound
Hotel and Conference Center (210 Units)	ITE Land Use 310 (Hotel) calculated total trips	59	41	67	64
	Non-Auto Trip Reduction	(12)	(9)	(14)	(14)
	Total Hotel and Conference Center vehicle trips	46	32	53	51
Medical Center (research) (220,000 ft ²)	ITE Land Use 720 (Medical- Dental Office Building) calculated total trips	351	99	209	538
	Non-Auto Trip Reduction	(74)	(21)	(44)	(113)
	Total Medical Center (research) vehicle trips	278	78	165	425
Total		688	177	298	852

Table 5.5: 2026 Site Generated Person Trips

Primary Travel Mode	Modal Split Percentage			
	A.M. Peak Hour		P.M. Peak Hour	
	Inbound	Outbound	Inbound	Outbound
Auto – Driver	79%	79%	79%	79%
Transit	15%	15%	15%	15%
Walking and Cycling	6%	6%	6%	6%
Computation				
Equivalent Average Auto	1.00	1.00	1.00	1.00
ITE Trip Generation Raw Trips	872	224	377	1079
Total Person Trips	872	224	377	1079
Auto Person Trips	688	177	298	852
Transit Person Trips	131	34	57	162
Active Person Trips	52	13	23	65

Table 6.2: 2021 Future Total Queues at Study Intersections

Intersection / Movement	Available Storage (m)	50th Percentile Queues		95th Percentile Queues	
		A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour
Bronte Road & Dundas Street West					
Eastbound Left	97	33	35	54	85
Eastbound Through	192	89	87	105	103
Eastbound Right	84	45	31	82	50
Westbound Left	116	26	28	78	74
Westbound Through	440	77	126	90	145
Northbound Left	130	53	70	82	91
Northbound Through	335	107	202	146	251
Northbound Right	68	1	24	5	39
Southbound Left	160	31	38	73	84
Southbound Through	410	131	60	167	93
Southbound Right	64	1	0	5	7

From: Timothy J. Arnott <Arnott@bagroup.com>
Sent: April 7, 2022 6:01 PM
To: Syed Rizvi <syed.rizvi@oakville.ca>
Cc: Paul Barrette <paul.barrette@oakville.ca>; Jill Stephen <jill.stephen@oakville.ca>; Melanie Hare <mhare@urbanstrategies.com>; Yiwen Zhu <yzhu@urbanstrategies.com>; Ning Lin <nlin@urbanstrategies.com>; Izabela Molendowski <imolendowski@urbanstrategies.com>; Morley, Piper <PMorley@blg.com>
Subject: Re: Upper Kerr Transportation Analysis - "Kerr Street Underpass - Deferred Indefinitely" Scenario

SECURITY CAUTION: This email originated from outside of The Town of Oakville. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Syed, thank you for the direction on the additional analyses associated with the Kerr Street grade separation deferral conditions.

I'll review in more detail with our team and get back to you if we have any questions.

Best regards,
 Tim Arnott
 BA Group

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From: Syed Rizvi <syed.rizvi@oakville.ca>
Sent: Thursday, April 7, 2022 5:40 PM

To: 'Timothy J. Arnott' <arnott@bagroup.com>

Cc: Paul Barrette <paul.barrette@oakville.ca>; Jill Stephen <jill.stephen@oakville.ca>

Subject: RE: Upper Kerr Transportation Analysis - "Kerr Street Underpass - Deferred Indefinitely" Scenario

Hi Tim,

The following updated TIS scope of work is provided to review the Transportation impacts of the proposed developments under deferred status of the Kerr Street underpass:

- 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 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 Upper Kerr Transportation Analysis needs to be updated to review and analyze the transportation impacts of the subject application based on potential conditions of the current level crossing in the horizon years of 2031 and 2036.
- The following scenarios are to be included in the updated TIS:
 1. Grade separation in place by 2031
 2. Grade separation and associated road widening, intersection improvements, turning lanes, and active transportation infrastructure deferred beyond 2031 and 2036
 3. Grade separation deferred beyond 2031 and 2036 but other transportation improvements and signal timing changes are in place. Required infrastructure improvements to support the proposed development to be identified through the TIS.
 4. Level crossing is closed and there is no through access along Kerr Street across the existing level crossing
- Under each scenario, identify any transportation network improvements required to support the Upper Kerr development, including any interim works. In the absence of those transportation network improvements, identify the impacts on the number of units, amount of floor space, and phasing of the Upper Kerr development based on available transportation network capacity.
 - Functional designs of the proposed infrastructure improvements are to be provided
 - Infrastructure improvements that would impact the future deliverability of a grade separation should not be included in the analyses.
- Under the second and third scenarios, the analysis shall also identify the impacts of the current and expected future increased number of train trips expected along the Lakeshore West Corridor on the trip distribution from the proposed Upper Kerr development, as well as the impacts operations on the town's road network in the vicinity of the proposed Upper Kerr development. Identify the current exposure index and how that changes with the proposed development in place.
- The same study area that was used for the previous version of the TIS is to be used for this updated analysis as well.

Please feel free to contact for any questions.

Thanks,
Syed

From: Timothy J. Arnott <Arnott@bagroup.com>

Sent: April 5, 2022 4:07 PM

To: Syed Rizvi <syed.rizvi@oakville.ca>

Cc: Paul Barrette <paul.barrette@oakville.ca>

Subject: Re: Upper Kerr Transportation Analysis - "Kerr Street Underpass - Deferred Indefinitely" Scenario

SECURITY CAUTION: This email originated from outside of The Town of Oakville. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Syed, thanks for the update.

We're trying to complete the analyses by mid April to stay on track for all of the OPA process deadlines, so if you could get back to me at your earliest convenience I'd really appreciate it.

Thanks,
Tim Arnott
BA Group

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From: Syed Rizvi <syed.rizvi@oakville.ca>
Sent: Tuesday, April 5, 2022 3:42:52 PM
To: 'Timothy J. Arnott' <Arnott@bagroup.com>
Cc: Paul Barrette <paul.barrette@oakville.ca>
Subject: RE: Upper Kerr Transportation Analysis - "Kerr Street Underpass - Deferred Indefinitely" Scenario

Hi Tim,

Thanks for providing summary of the Transportation analysis under deferred scenario of the Kerr Street underpass. Due to the complex nature of subject changes I have been directed by senior management to consult Town staff from other departments involved in the project for their input on assumptions illustrated in your email before we start working on the revised scenarios. It is particularly due to some unknowns due to recent changes and we want to make sure we adopt reasonable assumptions regarding development and planning for the Transportation Study.

I am expecting staff feedback on study parameters later this week and I will get back to you as soon as internal review is completed.

Thanks,
Syed

Syed Rizvi, M.Sc., P. Eng
Transportation Engineer
Transportation and Engineering
Town of Oakville | 905-845-6601, ext.3981 | www.oakville.ca

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From: Timothy J. Arnott <Arnott@bagroup.com>
Sent: April 1, 2022 11:55 AM
To: Syed Rizvi <syed.rizvi@oakville.ca>
Subject: Upper Kerr Transportation Analysis - "Kerr Street Underpass - Deferred Indefinitely" Scenario

SECURITY CAUTION: This email originated from outside of The Town of Oakville. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hello Syed, further to our conversation the other day, I provide below a brief summary of the parameters that we'd adopt to review the implications of the "Kerr Street Underpass – Deferred Indefinitely" scenario from a transportation perspective:

- The "Underpass" has not been "cancelled" but rather "deferred indefinitely" – which would require the lands that have been expropriated for the underpass, inclusive of those lands that were also identified as being required to construct the Underpass (via easements), need to be set aside and would not form any part of an 'interim' or phased development upon the block of land west of Kerr Street and north of Speers Road that is the subject of the Official Plan Amendment being reviewed presently;
- The lands required for the Underpass have been expropriated by Metrolinx and lands required for the construction of the underpass have also been identified and secured via easement by Metrolinx;
- A portion of the Upper Kerr Village OPA lands could be developed in prior to the Underpass being constructed by adopting portions of the planned OPA network that lay outside of the expropriation lands (and construction easement lands) that would provide anticipated connections to Speers Road (i.e., right-in/right-out connection to Speers Road where there had been a planned interim connection Speers Road prior to the 171 Speers Road lands being developed within the OPA lands.
- Any connections to Kerr Street must respect the future horizontal and vertical alignment conditions planned in conjunction with the Kerr Street Underpass condition, including the future location and alignment of the Kerr Street/Shepherd Road signalized intersection.
- The Speers Road improvements that have been identified in the Speers Road EA reports could be introduced in the absence of the Kerr Street Underpass.
- The planned improvements to Kerr Street, north of Speers Road, (including the SB dual left turn lanes) could be introduced, in part, in advance of the Kerr Street underpass, recognizing that these improvements would likely have to be limited to minimize any "throw-away" costs associated with their implementation as one moves the further north of Speers. The tolerance for any "throw-away" costs are likely influenced by the length of the "deferral" associated with the Underpass implementation; i.e., a long term deferral may increase the tolerance for greater throw-away costs given the duration of benefits. This would be driven by Town of Oakville staff.
- It is assumed that Kerr Street would remain a "two-lane" road as it crosses the at-grade rail crossing.
- A functional design of such Kerr Street improvements would be provided to characterize what and how any Kerr Street improvements could be configured.
- It is assumed that given increased train frequencies along the Metrolinx Lakeshore West corridor, the number and duration of disruptions to traffic flow along Kerr Street would increase over time. This would be estimated as part of any analyses that retains the at-grade crossing condition.
- It is assumed that both the 2031 and 2036 conditions would be reviewed for a "deferred indefinitely" Underpass scenario.

These parameters will be confirmed with Town staff early next week following internal Town of Oakville staff review of the above.

Please let me know what may be a convenient time to discuss the outcome of the internal Town staff discussions.

Best regards,
Tim

Timothy J. Arnott, MCIP, RPP
Principal

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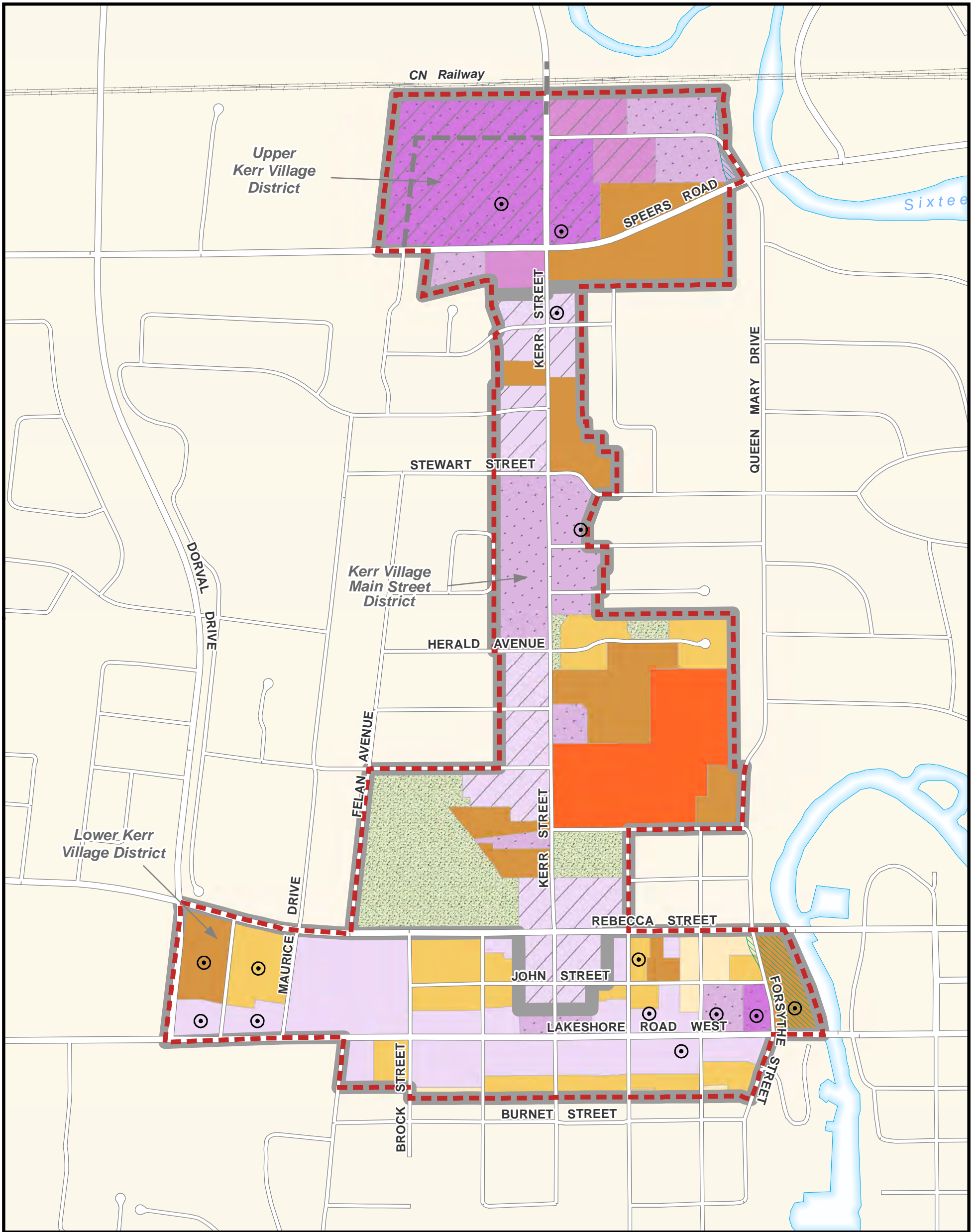


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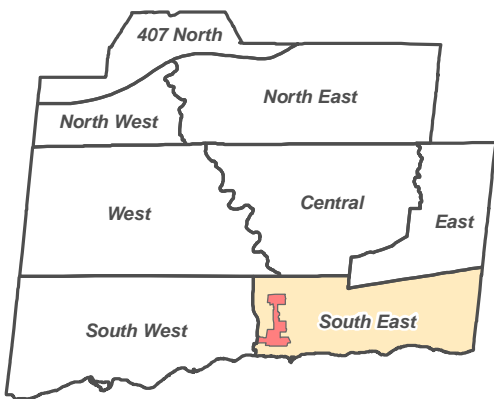
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**APPENDIX B:
Schedules O1 and O2 – Growth Areas, Livable Oakville Plan,
August 31, 2021**





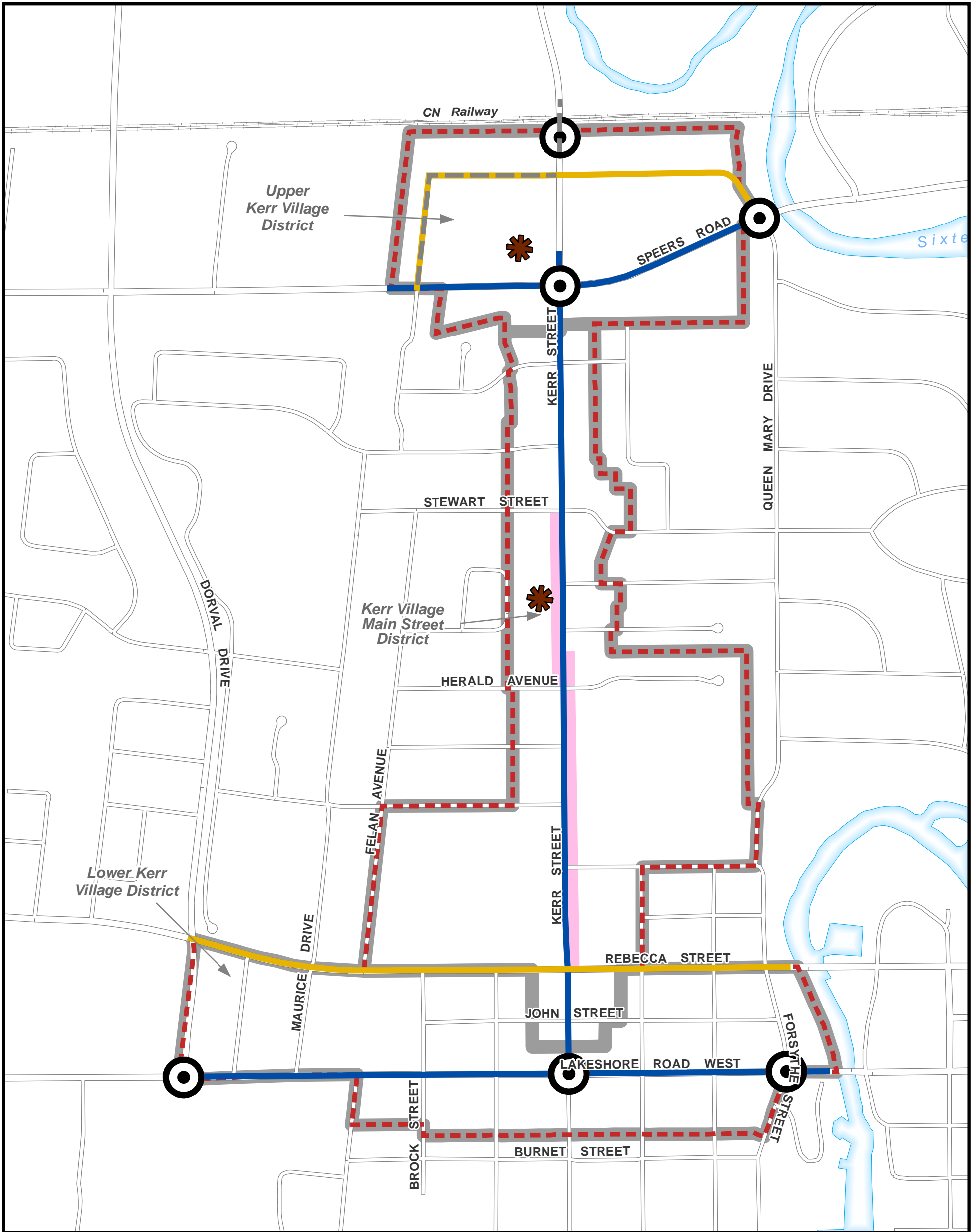
SCHEDULE 01 KERR VILLAGE LAND USE



- GROWTH AREA BOUNDARY
- LOW DENSITY RESIDENTIAL
- MEDIUM DENSITY RESIDENTIAL
- HIGH DENSITY RESIDENTIAL
- MAIN STREET 1
- MAIN STREET 2
- URBAN CENTRE
- URBAN CORE
- INSTITUTIONAL
- PARKS AND OPEN SPACE
- GREENBELT - URBAN RIVER VALLEY
- LANDS ELIGIBLE FOR BONUSING
- DISTRICT BOUNDARIES
- PROPOSED ROADS
- RAILWAY
- Refer to Part E, Kerr Village, for Growth Area Policies
- Refer to Part E, Kerr Village Exceptions












1: 6,000
August 31, 2021



SCHEDULE O2 KERR VILLAGE URBAN DESIGN



-  GROWTH AREA BOUNDARY
-  PRIMARY STREET
-  SECONDARY STREET
-  ENHANCED STREETScape AREA
-  URBAN SQUARE
-  GATEWAY
-  DISTRICT BOUNDARY
-  PROPOSED ROADS
-  RAILWAY



1: 6,000
August 31, 2021

**APPENDIX C:
Kerr Village Excerpts (p. E31 to E42) from Part E: Growth Areas,
Special Policy Areas and Exceptions, Livable Oakville Plan,
August 31, 2021**



23. KERR VILLAGE

Kerr Village, as shown on Schedule O1, is located along the length of Kerr Street, from the railway tracks in the north to just south of Lakeshore Road West in the south. The southerly portion of the village extends along Lakeshore Road West, from Dorval Drive in the west to Sixteen Mile Creek in the east. Kerr Street, and Lakeshore Road West, are the main streets of the village, where a mix of commercial, residential and institutional land uses are found.

Kerr Village will accommodate *intensification* through new *development* and redevelopment, with a mix of residential and commercial uses. The Village will also continue to function as a location for institutional, recreational and public open space uses.

23.1 Goal

Kerr Village will be revitalized as a vibrant business district and cultural area.

23.2 Objectives

As Kerr Village develops, the Town will, through public actions and in the process of reviewing planning applications, use the following objectives to guide decisions.

- 23.2.1 Create opportunities for new, sustainable growth by promoting *compact urban form* with higher density *development* through *compatible development* and redevelopment opportunities.
- 23.2.2 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*.
- 23.2.3 Create an attractive public realm by:
 - d) promoting high quality streetscapes and open spaces to create a comfortable, accessible and unique community; and,
 - e) ensuring appropriate transitions occur between the main street areas and the lower density residential neighbourhoods.

23.3 Development Concept

Kerr Village is comprised of three land use districts that are structured to provide an appropriate transition in land use and built form between the existing residential areas and any future *development* and redevelopment.

23.3.1 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. The District will include appropriate gateway features, an urban park with pedestrian mid-block connections and opportunities for *affordable housing*. Employment designations adjacent to the District are to remain, and any new *development* shall incorporate measures to buffer *Employment Areas* from potentially incompatible uses.

23.3.2 Kerr Village Main Street District

The Kerr Village Main Street District will be a predominantly mixed use area along Kerr Street with residential buildings including commercial or office uses at-grade. *Development* shall be set back to allow for pedestrian activity and attractive streetscapes. A gathering point for the community, such as a market, shall be encouraged here.

23.3.3 Lower Kerr Village District

The Lower Kerr Village District shall largely be a mixed use area, allowing for a mixture of commercial, office and residential uses, including some standalone residential uses, extending from Downtown Oakville, with a defined entrance into Kerr Village.

23.4 Functional Policies

In addition to the policies of Parts C and D of this Plan, the following functional policies apply to Kerr Village.

23.4.1 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.

- c) Parking
 - i) Surface parking lots shall be limited. Where surface parking is provided, the visual impact of large surface lots shall be mitigated by a combination of setbacks and significant landscaping including:
 - pavement treatment;
 - low walls or decorative fencing;
 - landscape material; and,
 - trees and lighting throughout parking lots and along the edges.
 - ii) Access to parking and servicing areas should not occur from Kerr Street but from local streets, service lanes and to the side or rear of buildings.
 - iii) On-street parking shall be maintained throughout Kerr Village with the exception of Speers Road and Kerr Street north of Speers Road. It is the intent that on-street parking shall be permitted at all times.
- 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.

23.4.2 Minimum Density

A minimum planned density shall be established for Kerr Village through Provincial plan conformity coordinated with Halton Region.

23.5 Urban Design

In addition to the Urban Design policies in section 6 of this Plan, the following policies shall apply specifically to Kerr Village. The urban design plan for Kerr Village is provided on Schedule O2.

23.5.1 General

Development and public realm improvements, including the streetscape for Kerr Street and Lakeshore Road West, shall be evaluated in accordance with the urban design direction provided in the Livable by Design Manual.

23.5.2 Public Realm

Enhanced streetscape areas, as identified on Schedule O2, should be incorporated in the design of new *developments*, streetscapes and open space areas, and utilized as a unifying public realm element through the use of compatible, consistent and complementary design treatments while contributing to a distinctive and unique streetscape. Enhanced streetscape areas may include the preservation of existing large stature trees and open space areas, as well as larger setbacks in built form and the creation of additional pedestrian-oriented spaces.

23.5.3 Streetscapes

- a) Primary and secondary streets, as identified on Schedule O2, shall provide for pedestrian-oriented streetscapes through the use of wide sidewalks, landscaping and furnishings.
- b) Buildings along primary streets, as identified on Schedule O2, shall:
 - i) incorporate a high degree of transparency on the ground floor;
 - ii) provide building openings and principal entrances facing the street; and,
 - iii) contain commercial, community, cultural or limited office uses adjacent to the street which foster an active main street environment.
- c) Buildings along secondary streets, as identified on Schedule O2, should:
 - i) incorporate a high degree of transparency on the ground floor;
 - ii) provide building openings and principal entrances facing the street; and,
 - iii) contain commercial, office, community or cultural uses adjacent to the street which support the main street district, and may also contain residential uses on the ground floor.

23.5.4 Gateways

- a) Through public actions and the *development* process, gateway treatments shall be provided in Kerr Village.
- b) Gateways are identified on Schedule O2 and indicate locations that are visually prominent entry points into Kerr Village. These locations shall provide gateway treatments which may include well designed built form or structures, distinctive streetscape treatments, landscaping, and/or public art. Gateway locations include:
 - i) the future Kerr Street underpass and railway crossing;
 - ii) Speers Road and Kerr Street;

- iii) Speers Road at the Queen Mary Drive bridge;
- iv) Lakeshore Road West and Kerr Street;
- v) Lakeshore Road West and Dorval Drive; and,
- vi) Lakeshore Road West and Forsythe Street.

23.5.5 Urban Squares

- a) Through the *development* process, a new park shall be provided in the Upper Kerr Village District, west of Kerr Street, north of Speers Road.
- b) Heritage Square, located on the west side of Kerr Street opposite Florence Drive, should be a gathering area with hard surfaced and landscaped elements appropriate for an array of public event uses. Built form and land uses surrounding the urban square are to complement and enhance the area.

23.5.6 Built Form

- a) *Development* within the Mixed Use designations south of Speers Road that does not have direct frontage on Kerr Street is encouraged to consolidate with lots that front onto Kerr Street to ensure comprehensive *development*.
- b) Buildings greater than three storeys in height, on lands immediately adjacent to lands designated Residential Low Density, shall be stepped back above the third storey.

23.6 Land Use Policies

Land use designations are provided on Schedule O1. In addition to the policies of Part D of this Plan, the following policies apply specifically to Kerr Village.

23.6.1 The lands designated Main Street 2, and known as 21 to 45 Shepherd Road (on the north side) and 20 to 40 Shepherd Road (on the south side), are a transition area subject to the following additional policies:

- a) Stand-alone Medium Density Residential uses may be permitted.
- b) The type, size and location of non-residential uses shall be determined through the *development* process and regulated by the implementing zoning.
- c) *Development* in the transition area shall:
 - i) enhance the quality of the existing surrounding residential context;
 - ii) contribute to a sensitive transition to the Low Density Residential uses to the south;

- iii) be *compatible* with adjacent, existing *development* with respect to scale, form and *character*; and,
 - iv) be sensitive to negative traffic impacts on Queen Mary Drive through access control, restricted parking standards and transit amenities.
- d) On the property known as 21 Shepherd Road, an increase in the size of the standard setback for the *stable top-of-bank* of Sixteen Mile Creek valley may be required for greater protection of the valleylands.
- 23.6.2 The maintenance of a food store in any redevelopment of lands within the Urban Core designation shall be encouraged.
- 23.6.3 On the lands designated Main Street 1 and Main Street 2, residential uses may be permitted on the ground floor, including *multiple-attached dwellings* and apartments, except where adjacent to Lakeshore Road West, Kerr Street and Speers Road, where commercial, community, cultural or limited office uses shall be provided on the ground floor facing the street, to maintain and enhance a pedestrian-oriented main street function.
- 23.6.4 The lands located between the properties designated Main Street 1 south of Lakeshore Road West, and the properties designated Low Density Residential on the north side of Burnet Street, from Brock Street to Forsythe Street, are a transition area, as implemented by the Zoning By-law, and subject to the following additional policies:
- a) Medium Density Residential uses shall be permitted.
 - b) Limited commercial uses that are non-retail and do not generate major traffic and noise may also be permitted at 79, 82 and 86 Wilson Street. *Development* in the transition area shall:
 - i) enhance the quality of the existing surrounding residential context;
 - ii) contribute to a sensitive transition from the lands to the north of the transition zone with those to the south;
 - iii) be *compatible* with adjacent, existing *development* with respect to scale, form and *character*; and,
 - iv) be sensitive to neighbouring heights, massing, setbacks from the street, distance between buildings, architectural form, colour and materials.
- 23.6.5 The lands subject to the Greenbelt Urban River Valley are a *Greenbelt area* and subject to section 26.5 of this Plan.

23.6.6 On lands north of Lakeshore Road, offices and limited commercial uses which do not generate major traffic and noise may also be permitted as stand-alone uses within existing detached dwellings.

23.7 Kerr Village Exceptions – Schedule O1

The following additional policies apply to certain lands on Schedule O1, Kerr Village Land Use.

23.7.1 The lands designated Urban Core at the northwest corner of Speers Road and Kerr Street are subject to the following additional policies:

- a) As part of any *development* approval, *development* and redevelopment shall be based on a comprehensive development plan which demonstrates the potential full build out of the lands.
- b) Redevelopment of existing low-rise commercial uses may occur gradually in a phased manner. Notwithstanding the minimum building heights required by this Plan, building additions, alterations and/or replacements may be permitted where they can be demonstrated not to preclude the long-term redevelopment of the properties as set out in this Plan; and,
- c) On the west side of Kerr Street abutting the railway, any requirement for, and the size and location of, retail, service commercial and office uses on the ground floor of buildings shall be determined through the *development* process and regulated by the implementing zoning.

23.7.2 The lands designated Urban Core at the northeast corner of Speers Road and Kerr Street are subject to the following additional policies:

- a) The *development* shall consist of a maximum of two new buildings up to a maximum height of 19 and 21 storeys respectively with a total of 533 units (excluding the two heritage buildings), conditional on the owner entering into an agreement under section 37 of the *Planning Act*.
- b) Any site *development* will provide for the relocation and reuse of the existing two heritage buildings on site in accordance with an approved heritage permit.
- c) The design of the site is intended to create a gateway *development* marking the entrance to Kerr Village. The design is encouraged to incorporate the following urban design elements, which will be detailed further through the implementing zoning and approved site plan:
 - i) a pedestrian-first environment to be promoted through the siting of buildings (new and heritage structures) and the arrangement of driveways, amenity areas, parking areas and pedestrian networks;

- ii) a publicly accessible open space area/square;
- iii) enhanced pedestrian accessibility and connectivity along the Kerr Street and Speers Road frontages as well as through the site;
- iv) retention of the existing heritage buildings on site in a location which maximizes visibility and access;
- v) grade related commercial uses along Speers Road and, to the extent practical, along Kerr Street;
- vi) exclusively underground parking with the exception of a minor amount of short-term parking which may be located at grade;
- vii) a strong focal point at the corner of Kerr Street and Speers Road which incorporates an open space element; and,
- viii) building design that incorporates appropriate street setbacks for building podiums and towers to facilitate height transition.

23.7.3 On the lands designated Main Street 1 at the northeast corner of Prince Charles Drive and Kerr Street, a facility containing administrative offices and support services for a privately owned community centre may also be permitted.

23.7.4 On the lands designated Main Street 2 and known as 70 Stewart Street and 73 Washington Avenue, a maximum building height of four storeys shall be permitted.

23.7.5 The lands designated Medium Density Residential and High Density Residential in the general vicinity of Rebecca Street, Garden Drive, and Maurice Drive are subject to the following additional policies:

- a) On the lands designated Medium Density Residential, only *multiple attached dwellings* may be permitted with a maximum building height of three storeys.
- b) On the lands designated High Density Residential, only townhouses and apartments may be permitted with a maximum building height of four storeys.
- c) Redevelopment in accordance with a) and b), above, shall only occur when all of the lands within a *development* block have been acquired for *development* purposes.
 - i) Lands designated High Density Residential, between Dorval and Garden Drives, make up one *development* block.
 - ii) Lands designated Medium Density Residential along Rebecca Street, east of Garden Drive, constitute two *development* blocks.

- iii) The remaining lands designated Medium Density Residential, between Garden Drive and Maurice Drive, make up two *development* blocks:
 - one *development* block fronting Garden Drive, which may be developed for a maximum of 18 *multiple attached dwelling* units and at a maximum density of 53 units per *site hectare*; and,
 - the second *development* block fronting onto Maurice Drive to be developed in accordance with the Medium Density Residential land use and policy provisions of the Plan.
 - d) Redevelopment in accordance with a) and b), above, shall only occur upon confirmation of adequate water and wastewater services, the suitability of the adjoining roads to accommodate traffic and the submission of a block plan indicating the integration of the proposed redevelopment within the overall area.
 - e) Redevelopment in accordance with a), above, shall be subject to urban design guidelines approved by the Town.
 - f) Notwithstanding the above, the lands may continue to be used for the existing single detached dwellings until such time as comprehensive redevelopment occurs.
- 23.7.6 On the lands designated Main Street 1 on the north side of Lakeshore Road, between Dorval Drive and Maurice Drive:
- a) Retail and service commercial uses, and ancillary residential uses, may be permitted on the ground floor.
 - b) The maximum building height shall be four storeys.
 - c) Redevelopment of the lands between Garden Drive and Maurice Drive shall only occur at such time as all the lands within a *development* block have been acquired for *development* purposes. Lands fronting on to Garden Drive constitute one *development* block, while the remaining lands make up another *development* block.
 - d) Redevelopment in accordance with c), above, shall be subject to the urban design guidelines for the Maurice Drive area.
- 23.7.7 On the lands designated Medium Density Residential on the east side of Wilson Street between Rebecca Street and John Street, semi-detached dwellings may be permitted.
- 23.7.8 On the lands designated Main Street 1 located at 43 to 49 Lakeshore Road West, the redevelopment of existing drive-through facilities may occur. Notwithstanding the minimum building heights required by this Plan, building additions, alterations and/or

replacements may be permitted where they can be demonstrated not to preclude the long-term redevelopment of the properties as set out in this Plan.

- 23.7.9 On the lands designated Main Street 1 at the southwest corner of Lakeshore Road West and Chisholm Street, a maximum building height of five storeys may be permitted, conditional on the owner entering into an agreement under section 37 of the *Planning Act*.
- 23.7.10 On the lands designated Main Street 2 at the northeast corner of Lakeshore Road West and Chisholm Street, a maximum building height of six storeys shall be permitted along the John Street frontage.
- 23.7.11 On the lands designated Urban Core at the northwest corner of Lakeshore Road West and Forsythe Street, a maximum building height of 17 storeys may be permitted.
- 23.7.12 On the lands designated High Density Residential at the northeast corner of Lakeshore Road West and Forsythe Street a maximum of 68 apartment units shall be permitted. The maximum building height shall be in accordance with the implementing zoning.

23.8 Implementation Policies

In addition to the policies of Part F of this Plan, the following implementation policies shall apply to Kerr Village.

23.8.1 Phasing/Transition

- a) *Development* will likely occur gradually over the long-term and be co-ordinated with the provision of *infrastructure*, including:
- i) transit;
 - ii) transportation improvements;
 - iii) water and wastewater services;
 - iv) stormwater management facilities;
 - v) pedestrian and cycling facilities; and,
 - vi) *utilities*.
- b) The uses and buildings that legally existed prior to the adoption of this Plan may be permitted to continue, however, they are intended to be redeveloped in conformity with this Plan.

23.8.2 Bonusing

- a) The Town may allow the following increases beyond the maximum permitted height in the areas of Kerr Village delineated on Schedule O, without amendment to this Plan:
 - i) up to four storeys on the lands designated Urban Core, north of Speers Road and west of Kerr Street; and,
 - ii) up to two storeys on the remaining lands.
- b) The additional height may be allowed in exchange for the provision of public benefits as listed in section 28.8.2, and with priority given to those public benefits noted in section 23.8.2 d).
- c) The bonusing priorities for Kerr Village include transit and alternative transportation solutions.
- d) Additional public benefits considered appropriate for the application of increased height in Kerr Village may include, but are not limited to:
 - i) the provision of *affordable housing* units and/or rental housing units;
 - ii) community service/facility space;
 - iii) non-profit child care facilities;
 - iv) public art;
 - v) enhanced streetscape/public open space improvements; and,
 - vi) enhanced green building and energy conservation technology.

23.8.3 Programs and Initiatives

- a) The Town shall prepare a *community improvement plan* for a *community improvement project area* within Kerr Village in accordance with section 28.16 of this Plan and the *Planning Act*.
- b) A program for public art shall be encouraged that:
 - i) reflects the community *character* and history of Kerr Village;
 - ii) includes the artistic design of community infrastructure such as benches, lighting, sidewalks, bus shelters and bike racks; and,
 - iii) may be incorporated in to public and private *developments* as part of the project design.

- b) In the Upper Kerr Village district west of Kerr Street north of Speers Road, an urban park is proposed, which:
 - i) may be located within the site bound by the Shepherd Road extension to the north, Kerr Street to the east, Speers Road to the south and St. Augustine Road extension to the west;
 - ii) may provide public underground parking facilities with a “green roof” at street level forming the urban park portion of the site;
 - iii) may be accessed at street level via mid-block pedestrian connections and from Kerr Street, Speers Road and the north Gateway; and,
 - iv) is encouraged to be maintained through a public-private partnership.

**APPENDIX D:
Prior Recommended Public Street Improvements – 2009 Kerr
Village Transportation Assessment and the 2009 Speers Road
Environmental Study Report excerpts**



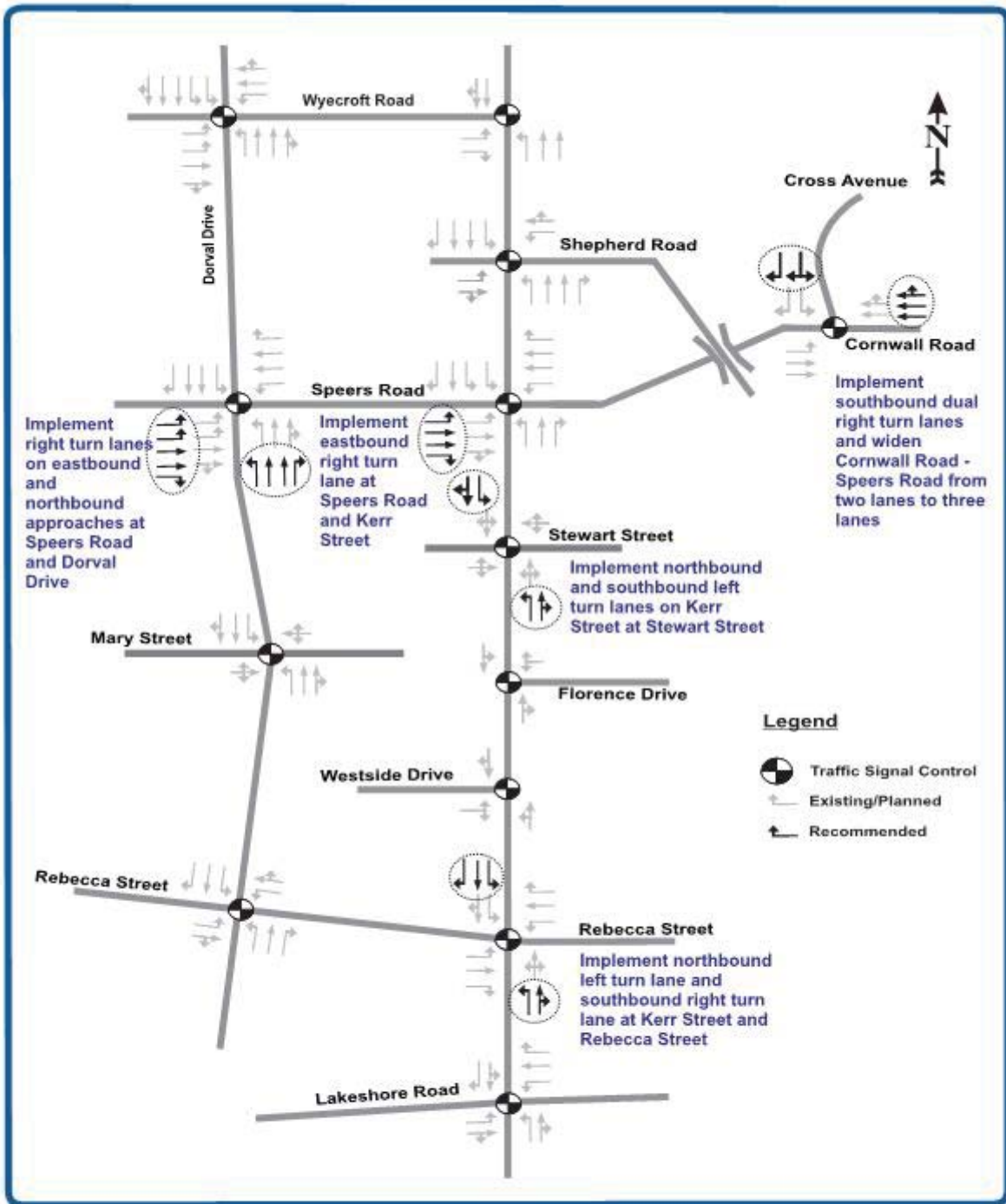
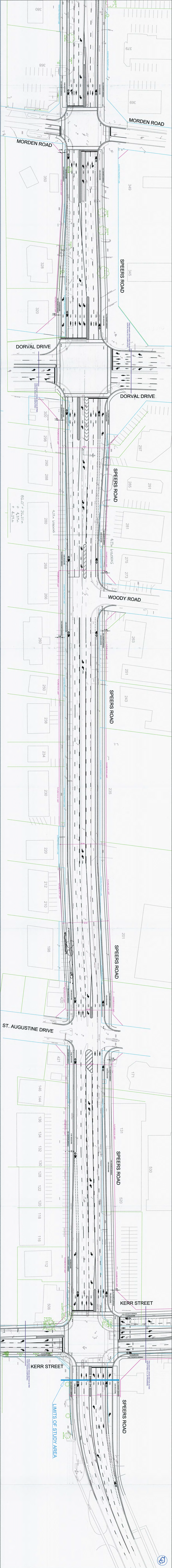


Figure 5.6 Recommended Improvements - 2021 Transportation Network
 Kerr Village Transportation Assessment, Oakville, Ontario





SPEERS ROAD - PREFERRED DESIGN
(from MORDEN ROAD to KERR STREET)

MARCH 11, 2009 SCALE = 1:500



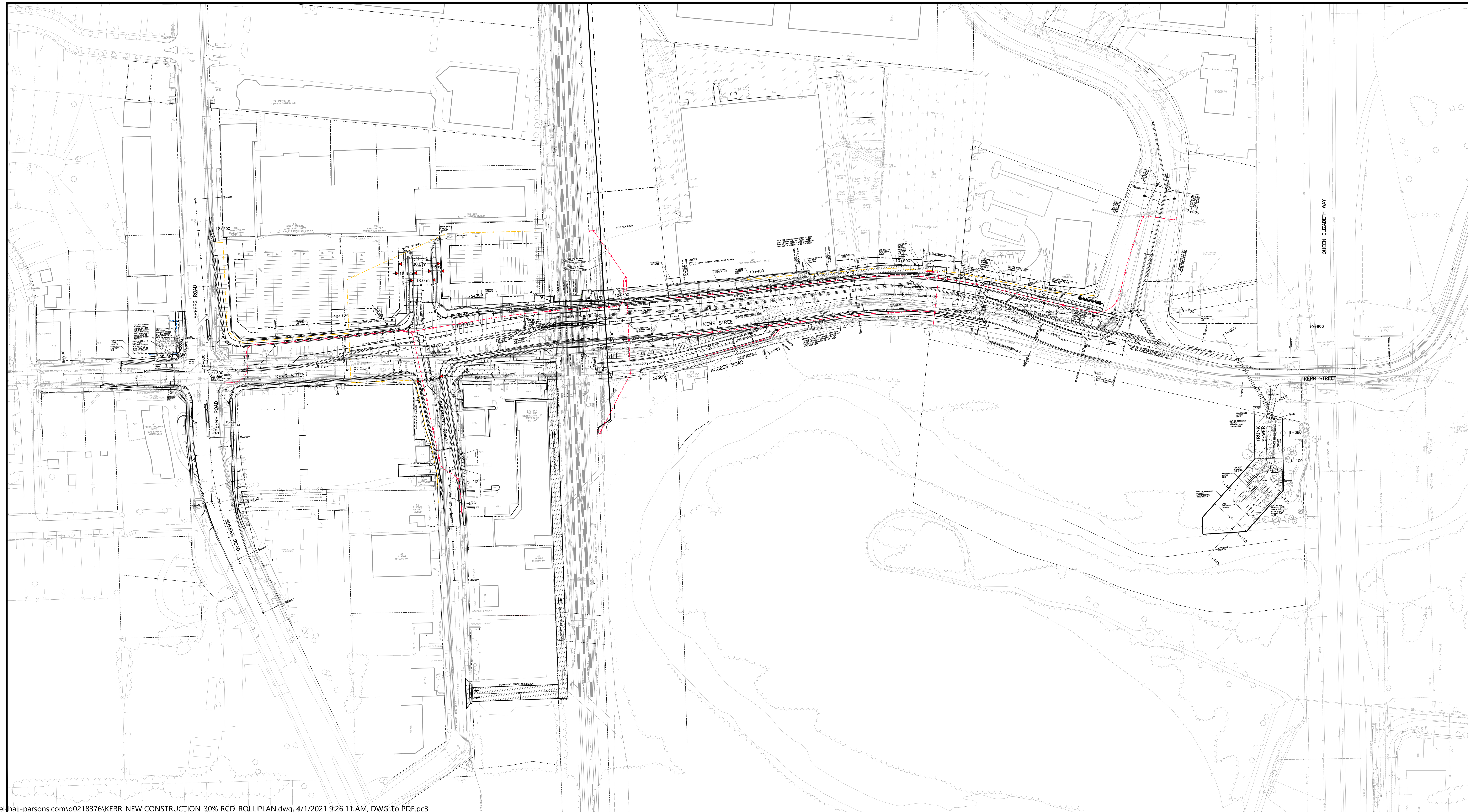
REV	COMMENT	DATE
1	ISSUED FOR TOWN REVIEW	OCT 10/08
2	ISSUED FOR TOWN REVIEW	NOV 10/08
3	ISSUED FOR TOWN REVIEW	NOV 10/08
4	ISSUED FOR TOWN REVIEW	NOV 10/08
5	ISSUED FOR TOWN REVIEW	NOV 10/08
6	ISSUED FOR TOWN REVIEW	NOV 10/08
7	ISSUED FOR TOWN REVIEW	NOV 10/08
8	ISSUED FOR TOWN REVIEW	NOV 10/08
9	ISSUED FOR TOWN REVIEW	NOV 10/08
10	ISSUED FOR TOWN REVIEW	NOV 10/08
11	PROPERTY OWNERS REVIEW	MAR 11/09

**APPENDIX E:
Kerr Street Grade Separation – Proposed Road Improvements –
30% design plans, dated March 25, 2021**



KERR STREET GRADE SEPARATION PROPOSED ROAD IMPROVEMENT

NEW CONSTRUCTION
RCD PLAN



HORT. SCALE: 1:750
DATE: 2021/03/25

DESIGN	DWG. NO.	NO.	DATE	REVISIONS	BY
JE	P-XXXX-XX	1	2021/03/25	ISSUED FOR RCD	JE
DRAWN	CONT. NO.				
JE	XX-XXX				
CHECKED	SHEET NO.				
NE	1				

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

**APPENDIX F:
Town of Oakville Existing Transit System Map – Kerr Village
Growth Area and Surrounding Transit Connections**



Town of Oakville Existing Transit System Map – Kerr Village Growth Area and Surrounding Transit Connections



OAKVILLE TRANSIT
Weekday Route Map

- Solid line indicates regular service route.
- Dashed line indicates rush hour or limited service route, or change in routing pattern.

Not all routes operate on Saturday, Sunday/Holidays.

Saturday Routes:
 3 4 5 5A 6 13 14 14A 15 18 19 20 24 28

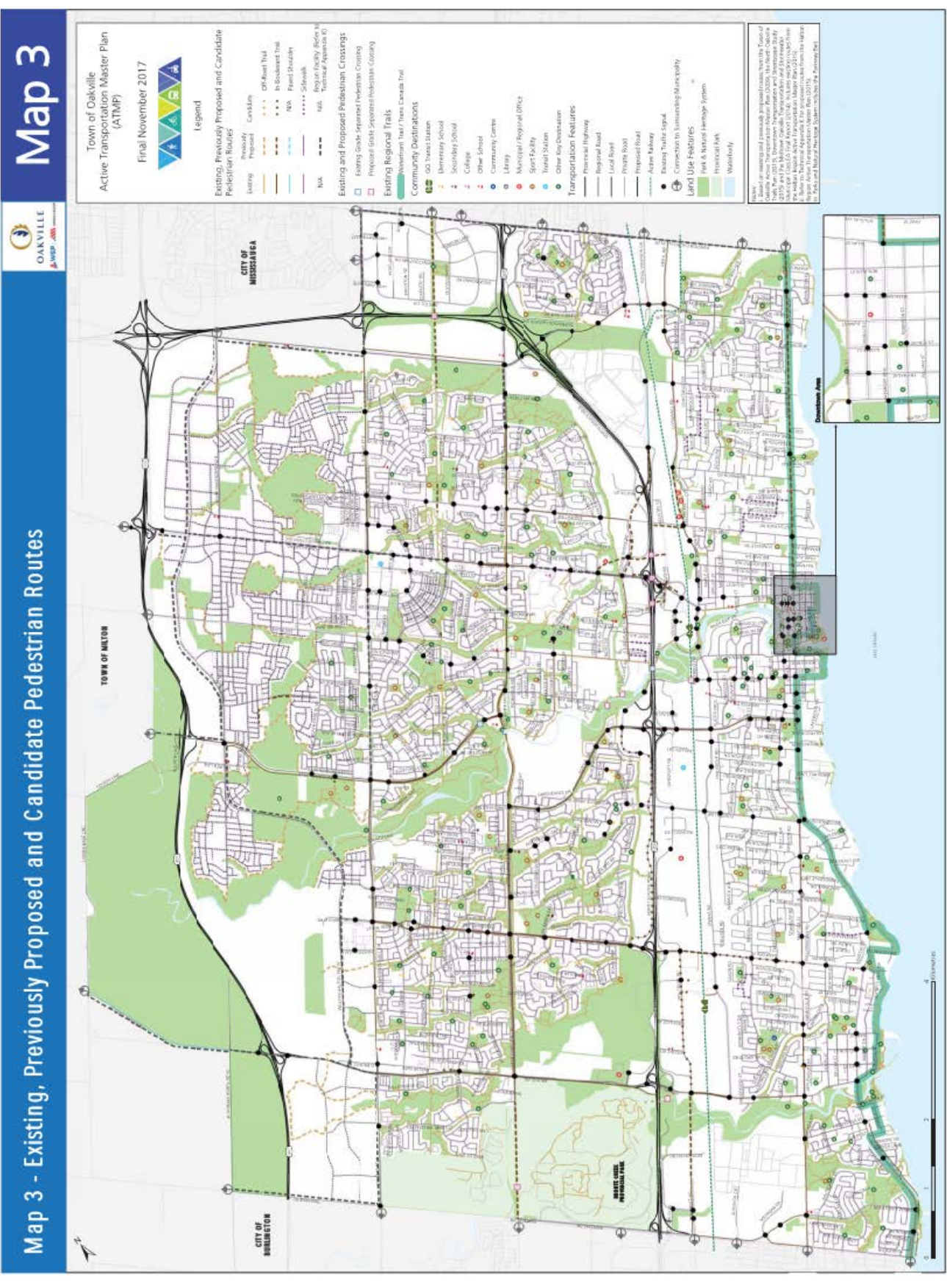
Sunday/Holidays Routes:
 3 4 5 6 13 14 14A 15 18 19 20 24 28

Visit oakvilletransit.ca for information on schedules, fares and other services.

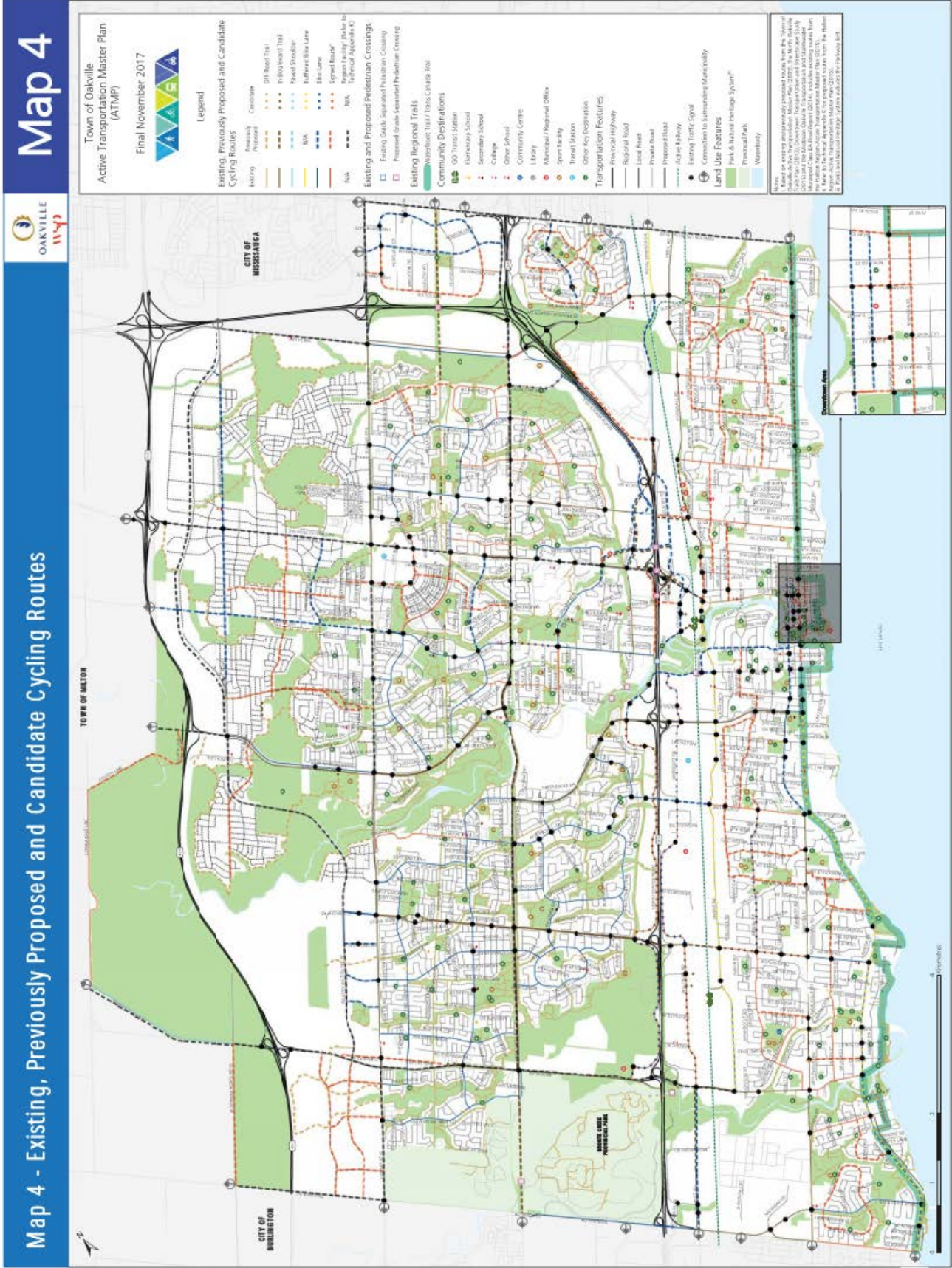
**APPENDIX G:
Existing, Previously Proposed and Candidate Pedestrian and
Cycling Routes – Town of Oakville Active Transportation
Master Plan, Nov 2017**



Map 3 – Existing, Previously Proposed and Candidate Pedestrian Routes – Town of Oakville Active Transportation Master Plan, Nov 2017



Map 4 – Existing, Previously Proposed and Candidate Cycling Routes – Town of Oakville Active Transportation Master Plan, Nov, 2017



APPENDIX H:
Modal Split Assumptions

Upper Kerr Village

8124-02
Mode Split
BA Group - EFS
2022-05-20

2016 ITS DATA

Residential (AM Peak Period)

Fri Jan 14 2022 13:17:14 GMT-0500 (Eastern Standard Time)

Frequency Distribution Query Form - Trip - 2016 v1.1

Field: Primary travel mode of trip - mode_prime

Filters:

2006 GTA zone of origin - gta06_orig in 4009,4012,4013,4011

and

Start time of trip - start_time in 600-859

and

Trip purpose of origin - purp_orig in H,

Table: Trip 2016	Count:	Expanded:
Transit excluding GO rail	8	203
Auto driver	3	45
GO rail only	111	2611
Joint GO rail and local transit	14	234
Motorcycle	10	158
Auto passenger	1	6
School bus	22	582
Paid rideshare	12	387
Walk	1	26
Total:	15	316
	197	4568

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

Residential (PM Peak Period)

Tue Jan 18 2022 14:15:22 GMT-0500 (Eastern Standard Time)

Frequency Distribution Query Form - Trip - 2016 v1.1

Field: Primary travel mode of trip - mode_prime

Filters:

2006 GTA zone of origin - gta06_orig in 4009,4011,4012,4013

and

Start time of trip - start_time in 1500-1759

and

Trip purpose of destination - purp_dest in H,

Table: Trip 2016	Count:	Expanded:
Transit excluding GO rail	13	397
Auto driver	1	12
GO rail only	225	5320
Joint GO rail and local transit	2	12
Auto passenger	35	995
School bus	24	832
Walk	16	349
Total:	317	7926

Driver	67%
Passenger	13%
Transit	16%
Walk	4%
Cycle	0%
Total	100%

Retail (AM Peak Period)

Sun Jan 30 2022 13:10:05 GMT-0500 (Eastern Standard Time)

Frequency Distribution Query Form - Trip - 2011,2016 v1.1

Field: Primary travel mode of trip - mode_prime

Filters:

2006 GTA zone of destination - gta06_dest in 4009,4012,4013,4011

and

Start time of trip - start_time in 600-1159

and

Trip purpose of destination - purp_dest in M,

or

(2006 GTA zone of origin - gta06_orig in 4009,4012,4013,4011

and

Start time of trip - start_time in 600-1159

and

Trip purpose of origin - purp_orig in M,)

Table: Trip 2016	Count:	Expanded:
Transit excluding GO rail	4	47
Cycle	2	73
Auto driver	67	1661
GO rail only	1	23
Auto passenger	9	181
Walk	2	25
Total:	85	2011

Driver	83%
Passenger	9%
Transit	3%
Walk	1%
Cycle	4%
Total	100%

Retail (PM Peak Period)

Sun Jan 30 2022 13:11:25 GMT-0500 (Eastern Standard Time)

Frequency Distribution Query Form - Trip - 2011,2016 v1.1

Field: Primary travel mode of trip - mode_prime

Filters:

2006 GTA zone of destination - gta06_dest in 4009,4012,4013,4011

and

Start time of trip - start_time in 1500-1759

and

Trip purpose of destination - purp_dest in M,

or

(2006 GTA zone of origin - gta06_orig in 4009,4012,4013,4011

and

Start time of trip - start_time in 1500-1759

and

Trip purpose of origin - purp_orig in M,)

Table: Trip 2016	Count:	Expanded:
Transit excluding GO rail	2	63
Auto driver	76	1214
Auto passenger	16	303
Taxi passenger	1	53
Walk	2	81
Total:	97	1714

Driver	71%
Passenger	21%
Transit	4%
Walk	5%
Cycle	0%
Total	100%

**APPENDIX I:
Operational Analyses Summary Tables – Signalized and
Unsignalized Intersections**

Appendix I

Signalized Intersection Analysis Summary Indices

Upper Kerr Village Draft OPA Lands

January 2022

2 Kerr Street & Shepherd Road

Lane Group	Existing		Future Background		Future Total Interim (2031)		Future Total Ultimate (2036)	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	--(--)	--(--)	--(--)	--(--)	0.35 (0.17)	C (B)	0.41 (0.22)	C (B)
EBTR	--(--)	--(--)	--(--)	--(--)	0.07 (0.04)	C (B)	0.08 (0.05)	C (B)
WBTR	0.52 (0.39)	B (B)	--(--)	--(--)	--(--)	--(--)	--(--)	--(--)
WBL	--(--)	--(--)	0.35 (0.41)	B (B)	0.33 (0.39)	B (B)	0.32 (0.39)	B (B)
WBTR	--(--)	--(--)	0.15 (0.09)	B (B)	0.16 (0.13)	B (B)	0.16 (0.15)	B (B)
NBTR	0.20 (0.40)	A (A)	--(--)	--(--)	--(--)	--(--)	--(--)	--(--)
NBL	--(--)	--(--)	--(--)	--(--)	0.20 (0.37)	B (B)	0.07 (0.14)	B (A)
NBT	--(--)	--(--)	0.23 (0.44)	B (B)	0.26 (0.42)	B (B)	0.26 (0.43)	B (B)
NBR	--(--)	--(--)	0.05 (0.08)	A (A)	0.05 (0.07)	B (A)	0.05 (0.07)	B (A)
SBTL	0.41 (0.51)	A (A)	--(--)	--(--)	--(--)	--(--)	--(--)	--(--)
SBL	--(--)	--(--)	0.17 (0.28)	A (A)	0.19 (0.28)	A (A)	0.19 (0.28)	A (A)
SBT	--(--)	--(--)	0.24 (0.21)	A (A)	0.27 (0.21)	A (A)	0.28 (0.21)	A (A)
SBR	--(--)	--(--)	--(--)	--(--)	0.01 (0.03)	A (A)	0.02 (0.04)	A (A)
Overall	0.52 (0.54)	A (A)	0.34 (0.40)	A (A)	0.34 (0.39)	B (A)	0.35 (0.39)	B (A)

3 Kerr Street & Speers Road

Lane Group	Existing		Future Background		Future Total Interim		Future Total Ultimate	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.10 (0.18)	B (B)	0.14 (0.23)	B (B)	0.29 (0.51)	B (B)	0.14 (0.23)	B (B)
EBTR	0.65 (0.40)	C (C)	--(--)	--(--)	--(--)	--(--)	--(--)	--(--)
EBT	--(--)	--(--)	0.72 (0.39)	C (C)	0.71 (0.38)	C (C)	0.77 (0.40)	C (C)
EBR	--(--)	--(--)	0.07 (0.09)	C (D)	0.07 (0.09)	C (D)	0.07 (0.09)	C (D)
WBL	0.66 (0.63)	C (B)	0.77 (0.66)	C (B)	0.78 (0.64)	C (B)	0.79 (0.67)	D (B)
WBT	0.35 (0.45)	C (C)	0.46 (0.53)	C (C)	0.49 (0.56)	C (C)	0.47 (0.55)	C (C)
WBR	0.14 (0.35)	C (B)	0.15 (0.35)	C (B)	0.14 (0.37)	C (C)	0.15 (0.36)	C (B)
NBL	0.34 (0.56)	D (D)	0.30 (0.52)	C (D)	0.31 (0.53)	C (D)	0.31 (0.54)	C (D)
NBT	0.30 (0.45)	D (D)	0.32 (0.51)	D (D)	0.34 (0.56)	D (D)	0.34 (0.56)	D (D)
NBR	0.81 (0.16)	E (D)	0.87 (0.18)	E (D)	0.88 (0.17)	E (D)	0.88 (0.19)	E (D)
SBL	0.75 (0.69)	C (D)	0.79 (0.82)	E (E)	0.81 (0.84)	E (E)	0.80 (0.82)	E (E)
SBTR	0.42 (0.76)	C (D)	--(--)	--(--)	--(--)	--(--)	--(--)	--(--)
SBT	--(--)	--(--)	0.30 (0.75)	C (D)	0.33 (0.74)	C (D)	0.34 (0.75)	C (D)
SBR	--(--)	--(--)	0.07 (0.05)	C (D)	0.07 (0.04)	C (D)	0.07 (0.04)	C (D)
Overall	0.74 (0.70)	C (C)	0.82 (0.72)	D (C)	0.83 (0.71)	D (C)	0.84 (0.73)	D (C)

4 Dorval Road & Speers Road

Lane Group	Existing		Future Background		Future Total Interim		Future Total Ultimate	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.83 (0.82)	E (E)	0.94 (0.92)	E (E)	0.94 (0.91)	E (E)	0.94 (0.97)	E (F)
EBTR	0.60 (0.43)	D (C)	--(--)	--(--)	--(--)	--(--)	--(--)	--(--)
EBT	--(--)	--(--)	0.64 (0.50)	D (C)	0.69 (0.51)	D (C)	0.70 (0.53)	D (D)
EBR	--(--)	--(--)	0.03 (0.03)	C (C)	0.03 (0.03)	C (C)	0.03 (0.03)	C (C)
WBL	0.32 (0.49)	C (C)	0.35 (0.56)	C (D)	0.39 (0.51)	C (D)	0.42 (0.54)	C (D)
WBT	0.52 (0.63)	D (C)	0.61 (0.78)	C (D)	0.64 (0.80)	D (D)	0.65 (0.79)	D (E)
WBR	0.24 (0.84)	C (D)	0.32 (0.74)	B (C)	0.50 (0.78)	B (C)	0.57 (0.77)	B (C)
NBL	0.22 (0.26)	C (C)	0.22 (0.28)	C (C)	0.21 (0.28)	C (C)	0.22 (0.29)	C (C)
NBTR	0.95 (0.65)	E (D)	0.95 (0.78)	E (D)	0.93 (0.78)	E (D)	0.97 (0.83)	E (D)
SBL	0.69 (0.85)	C (D)	0.87 (0.90)	D (E)	0.91 (0.94)	E (E)	0.97 (0.98)	E (F)
SBT	0.33 (0.54)	A (B)	0.38 (0.59)	B (B)	0.38 (0.58)	A (B)	0.40 (0.60)	A (B)
SBR	0.20 (0.26)	B (A)	0.20 (0.31)	B (A)	0.20 (0.31)	B (A)	0.20 (0.32)	B (A)
Overall	0.80 (0.87)	D (C)	0.87 (0.89)	D (D)	0.90 (0.91)	D (D)	0.94 (0.94)	D (D)

5 St. Augustine Drive & Speers Road

Lane Group	Existing		Future Background		Future Total Interim		Future Total Ultimate	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	--(--)	--(--)	0.01 (0.03)	A (A)	0.01 (0.03)	A (A)	0.12 (0.34)	A (A)
EBTR	--(--)	--(--)	0.33 (0.29)	A (A)	0.34 (0.29)	A (A)	0.34 (0.27)	A (A)
WBTR	--(--)	--(--)	0.28 (0.38)	A (A)	0.32 (0.38)	A (A)	0.29 (0.38)	A (A)
NBR	--(--)	--(--)	0.01 (0.02)	E (E)	0.01 (0.02)	E (E)	0.01 (0.02)	D (D)
SBL	--(--)	--(--)	--(0.09)	--(E)	--(0.09)	--(E)	0.15 (0.16)	D (D)
SBTR	--(--)	--(--)	--(0.01)	--(E)	--(0.01)	--(E)	0.11 (0.06)	D (D)
Overall	--(--)	--(--)	0.32 (0.37)	A (A)	0.33 (0.37)	A (A)	0.33 (0.37)	A (A)

6 Speers Road/Cornwall Road & Cross Avenue

Lane Group	Existing		Future Background		Future Total Interim		Future Total Ultimate	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.35 (0.66)	A (B)	0.42 (0.64)	A (C)	0.42 (0.64)	A (C)	0.43 (0.64)	A (C)
EBT	0.46 (0.23)	A (A)	0.49 (0.27)	A (A)	0.50 (0.26)	A (A)	0.51 (0.27)	A (A)
WBTR	0.26 (0.49)	A (A)	0.30 (0.65)	A (C)	0.30 (0.66)	A (C)	0.30 (0.69)	A (C)
SBL	0.05 (0.06)	E (E)	0.04 (0.05)	E (E)	0.04 (0.05)	E (E)	0.04 (0.05)	E (E)
SBR	0.10 (0.45)	E (E)	0.11 (0.61)	E (E)	0.11 (0.61)	E (E)	0.11 (0.62)	E (E)
Overall	0.45 (0.65)	B (B)	0.49 (0.65)	B (C)	0.49 (0.66)	B (C)	0.50 (0.67)	B (C)

9 Kerr Street & Stewart Street

Lane Group	Existing		Future Background		Future Total Interim		Future Total Ultimate	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBTLR	0.26 (0.29)	C (C)	0.26 (0.29)	C (C)	0.26 (0.29)	C (C)	0.26 (0.29)	C (C)
WBTLR	0.25 (0.16)	C (C)	0.27 (0.16)	C (C)	0.27 (0.16)	C (C)	0.27 (0.16)	C (C)
NBTLR	0.43 (0.33)	A (A)	0.47 (0.37)	A (A)	0.48 (0.37)	A (A)	0.48 (0.39)	A (A)
SBTLR	0.37 (0.53)	A (A)	0.42 (0.59)	A (A)	0.44 (0.58)	A (A)	0.45 (0.59)	A (A)
Overall	0.41 (0.51)	B (A)	0.45 (0.55)	B (A)	0.45 (0.54)	B (A)	0.45 (0.56)	B (A)

10 Dorval Road & Wycroft Road

Lane Group	Existing		Future Background		Future Total Interim		Future Total Ultimate	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.60 (0.92)	D (E)	0.60 (0.98)	D (F)	0.60 (0.98)	D (F)	0.60 (0.98)	D (F)
EBTR	0.22 (0.29)	D (C)	0.22 (0.47)	D (D)	0.21 (0.49)	D (D)	0.21 (0.49)	D (D)
WBL	0.11 (0.19)	D (D)	0.11 (0.25)	D (D)	0.11 (0.25)	D (D)	0.10 (0.25)	D (D)
WBTR	0.37 (--)	D (D)	0.38 (--)	D (D)	0.43 (--)	D (D)	0.45 (--)	D (D)
WBT	--(0.22)	--(D)	--(0.43)	--(D)	--(0.45)	--(D)	--(0.45)	--(D)
WBR	--(0.88)	--(E)	--(0.89)	--(E)	--(0.89)	--(D)	--(0.89)	--(D)
NBL	0.51 (0.52)	C (C)	0.54 (0.42)	C (B)	0.55 (0.43)	C (B)	0.56 (0.44)	C (B)
NBTR	0.58 (0.79)	B (C)	0.66 (0.82)	B (D)	0.72 (0.87)	B (D)	0.77 (0.90)	C (D)
SBL	0.44 (0.42)	D (D)	0.44 (0.18)	D (D)	0.45 (0.20)	D (D)	0.46 (0.21)	D (D)
SBTR	0.68 (0.79)	C (D)	0.72 (0.64)	C (C)	0.75 (0.66)	C (C)	0.77 (0.68)	C (C)
Overall	0.60 (0.82)	C (D)	0.62 (0.88)	C (D)	0.64 (0.89)	C (D)	0.66 (0.91)	C (D)

Appendix I

Unsignalized Intersection Analysis Summary Indices

Upper Kerr Village Draft OPA Lands

January 2022

1 Kerr Street & Wyecroft Road

Lane Group	Existing		Future Background		Future Total Interim		Future Total Ultimate	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
EBLR	B (D)	14.7 (25.7)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
EBL	-- (--)	-- (--)	D (D)	28.4 (34.1)	D (E)	33.9 (38.2)	E (E)	36.2 (40.9)
EBR	-- (--)	-- (--)	B (B)	11.3 (12.0)	B (B)	11.5 (12.6)	B (B)	11.6 (12.9)
NBL	A (A)	9.6 (9.5)	A (A)	9.9 (9.8)	B (A)	10.2 (10.0)	B (B)	10.3 (10.1)
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)
SBT	-- (--)	-- (--)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)

5 St. Augustine Drive & Speers Road

Lane Group	Existing		Future Background		Future Total Interim		Future Total Ultimate	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
EBL	A (A)	8.6 (9.7)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
EBT	A (A)	0.0 (0.0)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
EBTR	A (A)	0.0 (0.0)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
WBT	A (A)	0.0 (0.0)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
WBTR	A (A)	0.0 (0.0)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
NBR	B (B)	11.7 (11.0)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
SBTLR	A (C)	0.0 (18.5)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)

7 Kerr Street & Prince Charles Drive

Lane Group	Existing		Future Background		Future Total Interim		Future Total Ultimate	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
EBTLR	C (C)	18.0 (24.4)	C (D)	18.9 (26.9)	C (D)	19.3 (26.2)	C (D)	19.7 (26.9)
WBTLR	C (C)	15.2 (18.4)	C (C)	15.9 (19.8)	C (C)	16.1 (19.6)	C (C)	16.2 (20.0)
NBTLR	A (A)	0.2 (0.2)	A (A)	0.2 (0.2)	A (A)	0.2 (0.2)	A (A)	0.2 (0.2)
SBTLR	A (A)	1.6 (0.6)	A (A)	1.6 (0.6)	A (A)	1.6 (0.6)	A (A)	1.6 (0.6)

8 Kerr Street & Elmwood Road

Lane Group	Existing		Future Background		Future Total Interim		Future Total Ultimate	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
EBLR	C (C)	16.5 (17.4)	C (C)	16.2 (19.0)	C (C)	16.0 (18.8)	C (C)	16.2 (19.2)
NBTL	A (A)	0.2 (0.2)	A (A)	0.2 (0.2)	A (A)	0.2 (0.2)	A (A)	0.2 (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)

11 Speers Road & Interim Connection

Lane Group	Existing		Future Background		Future Total Interim		Future Total Ultimate	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
EBT	-- (--)	-- (--)	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)
WBTR	-- (--)	-- (--)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)
SBR	-- (--)	-- (--)	A (A)	0.0 (0.0)	A (A)	9.5 (9.6)	A (A)	0.0 (0.0)

Signalized Intersections Analysis Results

2		Kerr Street & Shepherd Road									
	Future Total (Phase 1)		Future Total (Phase 1)		Future Total (Phase 2)		Future Total (Phase 2)		Future Total (Phase 2)		
	With Kerr St Improvements		Without Kerr St Improvements		With Kerr St Improvements		Without Kerr St Improvements		Kerr St Closure		
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	
WBL	0.34 (0.40)	B (B)	0.34 (0.40)	B (B)	0.35 (0.41)	B (B)	0.35 (0.41)	B (B)	0.46 (0.44)	B (B)	
WBTR	0.15 (0.10)	B (B)	0.15 (0.10)	B (B)	0.15 (0.10)	B (B)	0.15 (0.10)	B (B)	-- (--)	-- (--)	
NBT	0.23 (0.40)	B (B)	0.23 (0.40)	B (B)	0.25 (0.41)	B (B)	0.25 (0.41)	B (B)	-- (--)	-- (--)	
NBR	0.05 (0.07)	A (A)	0.05 (0.07)	A (A)	0.05 (0.07)	A (A)	0.05 (0.07)	A (A)	0.05 (0.07)	A (A)	
SBL	0.17 (0.27)	A (A)	0.17 (0.27)	A (A)	0.17 (0.27)	A (A)	0.17 (0.27)	A (A)	-- (--)	-- (--)	
SBT	0.23 (0.21)	A (A)	0.23 (0.21)	A (A)	0.23 (0.22)	A (A)	0.23 (0.22)	A (A)	-- (--)	-- (--)	
Overall	0.32 (0.37)	A (A)	0.32 (0.37)	A (A)	0.33 (0.39)	A (A)	0.33 (0.39)	A (A)	0.20 (0.18)	B (A)	

3		Kerr Street & Speers Road									
	Future Total (Phase 1)		Future Total (Phase 1)		Future Total (Phase 2)		Future Total (Phase 2)		Future Total (Phase 2)		
	With Kerr St Improvements		Without Kerr St Improvements		With Kerr St Improvements		Without Kerr St Improvements		Kerr St Closure		
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	
EBL	0.24 (0.29)	B (B)	0.23 (0.29)	B (B)	0.31 (0.34)	C (B)	0.29 (0.34)	C (B)	0.09 (0.13)	B (B)	
EBT	0.75 (0.39)	C (C)	0.73 (0.39)	C (C)	0.80 (0.41)	D (C)	0.78 (0.41)	D (C)	0.60 (0.46)	C (C)	
EBR	0.08 (0.09)	C (D)	0.08 (0.09)	B (D)	0.08 (0.09)	C (D)	0.08 (0.09)	C (D)	0.13 (0.13)	B (D)	
WBL	0.77 (0.65)	C (B)	0.72 (0.65)	C (B)	0.78 (0.67)	D (B)	0.73 (0.67)	C (B)	0.53 (0.64)	B (B)	
WBT	0.47 (0.56)	C (C)	0.45 (0.56)	C (C)	0.49 (0.58)	C (C)	0.48 (0.58)	C (C)	0.35 (0.57)	B (B)	
WBR	0.13 (0.32)	C (B)	0.13 (0.32)	C (B)	0.13 (0.32)	C (B)	0.13 (0.32)	C (B)	0.01 (0.08)	B (B)	
NBL	0.32 (0.55)	C (D)	0.35 (0.55)	C (D)	0.32 (0.56)	C (D)	0.36 (0.56)	C (D)	0.56 (0.68)	D (D)	
NBT	0.30 (0.49)	D (D)	0.36 (0.52)	D (D)	0.30 (0.48)	D (D)	0.35 (0.52)	D (D)	0.12 (0.01)	D (C)	
NBR	0.87 (0.19)	E (D)	0.84 (0.17)	E (D)	0.87 (0.20)	E (D)	0.83 (0.17)	E (D)	0.42 (0.17)	D (C)	
SBL	0.76 (0.77)	E (E)	0.73 (0.75)	C (D)	0.76 (0.77)	E (E)	0.73 (0.74)	C (D)	0.26 (0.00)	D (A)	
SBT	0.28 (0.72)	C (D)	0.30 (0.72)	C (D)	0.29 (0.73)	C (D)	0.30 (0.73)	C (D)	0.13 (0.43)	D (D)	
SBR	0.07 (0.06)	C (D)	0.07 (0.06)	C (D)	0.08 (0.07)	C (D)	0.08 (0.07)	C (D)	0.05 (0.02)	D (D)	
Overall	0.81 (0.70)	D (C)	0.77 (0.71)	C (C)	0.82 (0.71)	D (C)	0.78 (0.72)	D (C)	0.58 (0.69)	C (C)	

4		Dorval Road & Speers Road									
	Future Total (Phase 1)		Future Total (Phase 1)		Future Total (Phase 2)		Future Total (Phase 2)		Future Total (Phase 2)		
	With Kerr St Improvements		Without Kerr St Improvements		With Kerr St Improvements		Without Kerr St Improvements		Kerr St Closure		
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	
EBL	0.94 (0.92)	E (E)	0.94 (0.92)	E (E)	0.94 (0.99)	E (F)	0.94 (0.99)	E (F)	0.96 (1.05)	F (F)	
EBT	0.64 (0.50)	D (C)	0.64 (0.50)	D (C)	0.70 (0.52)	D (D)	0.70 (0.52)	D (D)	0.71 (0.50)	D (D)	
EBR	0.03 (0.03)	C (C)	0.03 (0.03)	C (C)	0.03 (0.03)	C (C)	0.03 (0.03)	C (C)	0.03 (0.03)	C (C)	
WBL	0.35 (0.49)	C (D)	0.35 (0.49)	C (D)	0.37 (0.52)	D (D)	0.37 (0.52)	D (D)	0.37 (0.50)	C (D)	
WBT	0.62 (0.78)	C (D)	0.62 (0.78)	C (D)	0.65 (0.79)	D (E)	0.65 (0.79)	D (E)	0.64 (0.79)	D (D)	
WBR	0.44 (0.80)	B (C)	0.44 (0.80)	B (C)	0.51 (0.80)	C (D)	0.51 (0.80)	C (D)	0.76 (1.11)	D (F)	
NBL	0.22 (0.29)	C (C)	0.22 (0.29)	C (C)	0.22 (0.29)	C (C)	0.22 (0.29)	C (C)	0.22 (0.30)	C (C)	
NBTR	0.96 (0.80)	E (D)	0.96 (0.80)	E (D)	0.97 (0.83)	E (D)	0.97 (0.83)	E (D)	0.98 (0.84)	E (D)	
SBL	0.94 (0.91)	E (E)	0.94 (0.91)	E (E)	0.99 (0.97)	E (F)	0.99 (0.97)	E (F)	1.35 (1.41)	F (F)	
SBT	0.39 (0.59)	B (B)	0.39 (0.59)	B (B)	0.41 (0.60)	B (B)	0.41 (0.60)	B (B)	0.43 (0.62)	B (B)	
SBR	0.20 (0.31)	B (A)	0.20 (0.31)	B (A)	0.20 (0.31)	B (A)	0.20 (0.31)	B (A)	0.21 (0.34)	C (A)	
Overall	0.90 (0.90)	D (D)	0.90 (0.90)	D (D)	0.95 (0.93)	D (D)	0.95 (0.93)	D (D)	1.17 (1.27)	E (E)	

5		St. Augustine Drive & Speers Road									
	Future Total (Phase 1)		Future Total (Phase 1)		Future Total (Phase 2)		Future Total (Phase 2)		Future Total (Phase 2)		
	With Kerr St Improvements		Without Kerr St Improvements		With Kerr St Improvements		Without Kerr St Improvements		Kerr St Closure		
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	
EBL	0.01 (0.03)	A (A)	0.01 (0.03)	A (A)	0.07 (0.22)	A (A)	0.07 (0.22)	A (A)	0.12 (0.40)	A (A)	
EBTR	0.34 (0.29)	A (A)	0.34 (0.29)	A (A)	0.37 (0.29)	A (A)	0.37 (0.29)	A (A)	0.39 (0.30)	A (A)	
WBTR	0.30 (0.38)	A (A)	0.30 (0.38)	A (A)	0.33 (0.41)	A (A)	0.33 (0.41)	A (A)	0.35 (0.45)	A (A)	
NBR	0.01 (0.02)	E (E)	0.01 (0.02)	E (E)	0.01 (0.02)	D (D)	0.01 (0.02)	D (D)	0.01 (0.02)	D (D)	
SBL	0.00 (0.09)	A (E)	0.00 (0.09)	A (E)	0.53 (0.45)	D (E)	0.53 (0.45)	D (E)	0.33 (0.28)	D (E)	
SBTR	0.00 (0.01)	A (E)	0.00 (0.01)	A (E)	0.04 (0.02)	D (D)	0.04 (0.02)	D (D)	0.06 (0.04)	D (D)	
Overall	0.33 (0.37)	A (A)	0.33 (0.37)	A (A)	0.38 (0.41)	A (A)	0.38 (0.41)	A (A)	0.38 (0.44)	A (A)	

6		Speers Road/Cornwall Road & Cross Avenue									
	Future Total (Phase 1)		Future Total (Phase 1)		Future Total (Phase 2)		Future Total (Phase 2)		Future Total (Phase 2)		
	With Kerr St Improvements		Without Kerr St Improvements		With Kerr St Improvements		Without Kerr St Improvements		Kerr St Closure		
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	
EBL	0.42 (0.64)	A (C)	0.42 (0.64)	A (C)	0.42 (0.64)	A (C)	0.42 (0.64)	A (C)	0.26 (0.55)	A (A)	
EBT	0.49 (0.26)	A (A)	0.49 (0.26)	A (A)	0.51 (0.27)	A (A)	0.51 (0.27)	A (A)	0.46 (0.21)	A (A)	
WBTR	0.29 (0.65)	A (C)	0.29 (0.65)	A (C)	0.30 (0.67)	A (C)	0.30 (0.67)	A (C)	0.26 (0.48)	A (A)	
SBL	0.04 (0.05)	E (E)	0.04 (0.05)	E (E)	0.04 (0.05)	E (E)	0.04 (0.05)	E (E)	0.05 (0.07)	E (E)	
SBR	0.11 (0.61)	E (E)	0.11 (0.61)	E (E)	0.11 (0.61)	E (E)	0.11 (0.61)	E (E)	0.09 (0.18)	E (E)	
Overall	0.49 (0.65)	B (C)	0.49 (0.65)	B (C)	0.50 (0.66)	B (C)	0.50 (0.66)	B (C)	0.45 (0.53)	B (B)	

9		Kerr Street & Stewart Street									
	Future Total (Phase 1)		Future Total (Phase 1)		Future Total (Phase 2)		Future Total (Phase 2)		Future Total (Phase 2)		
	With Kerr St Improvements		Without Kerr St Improvements		With Kerr St Improvements		Without Kerr St Improvements		Kerr St Closure		
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	
EBLTR	0.26 (0.29)	C (C)	0.26 (0.29)	C (C)	0.26 (0.29)	C (C)	0.26 (0.29)	C (C)	0.26 (0.29)	C (C)	
WBLTR	0.27 (0.16)	C (C)	0.27 (0.16)	C (C)	0.27 (0.16)	C (C)	0.27 (0.16)	C (C)	0.27 (0.16)	C (C)	
NBLTR	0.47 (0.36)	A (A)	0.47 (0.36)	A (A)	0.47 (0.37)	A (A)	0.47 (0.37)	A (A)	0.43 (0.32)	A (A)	
SBLTR	0.41 (0.56)	A (A)	0.41 (0.56)	A (A)	0.42 (0.58)	A (A)	0.42 (0.58)	A (A)	0.34 (0.49)	A (A)	
Overall	0.44 (0.53)	B (A)	0.44 (0.53)	B (A)	0.44 (0.54)	B (A)	0.44 (0.54)	B (A)	0.41 (0.47)	B (A)	

10		Dorval Road & Wyecroft Road									
	Future Total (Phase 1)		Future Total (Phase 1)		Future Total (Phase 2)		Future Total (Phase 2)		Future Total (Phase 2)		
	With Kerr St Improvements		Without Kerr St Improvements		With Kerr St Improvements		Without Kerr St Improvements		Kerr St Closure		
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	
EBL	0.60 (0.98)	D (F)	0.60 (0.98)	D (F)	0.60 (0.98)	D (F)	0.60 (0.98)	D (F)	0.60 (0.98)	D (F)	
EBTR	0.21 (0.48)	D (D)	0.21 (0.48)	D (D)	0.21 (0.47)	D (D)	0.21 (0.47)	D (D)	0.16 (0.42)	D (D)	
WBL	0.11 (0.25)	D (D)	0.11 (0.25)	D (D)	0.11 (0.25)	D (D)	0.11 (0.25)	D (D)	0.12 (0.31)	D (D)	
WBT	0.40 (0.44)	D (D)	0.40 (0.44)	D (D)	0.42 (0.45)	D (D)	0.42 (0.45)	D (D)	0.23 (0.40)	D (E)	
WBR	0.00 (0.90)	A (E)	0.00 (0.90)	A (E)	0.00 (0.89)	A (D)	0.00 (0.89)	A (D)	0.00 (0.84)	A (D)	
NBL	0.56 (0.43)	C (B)	0.56 (0.43)	C (B)	0.56 (0.44)	C (B)	0.56 (0.44)	C (B)	0.59 (0.49)	C (B)	
NBTR	0.70 (0.87)	B (D)	0.70 (0.87)	B (D)	0.74 (0.91)	B (D)	0.74 (0.91)	B (D)	0.74 (0.92)	B (D)	
SBL	0.44 (0.18)	D (D)	0.44 (0.18)	D (D)	0.44 (0.19)	D (D)	0.44 (0.19)	D (D)	0.37 (0.09)	D (D)	
SBTR	0.75 (0.65)	C (C)	0.75 (0.65)	C (C)	0.77 (0.68)	C (C)	0.77 (0.68)	C (C)	0.79 (0.69)	C (C)	
Overall	0.64 (0.90)	C (D)	0.64 (0.90)	C (D)	0.65 (0.91)	C (D)	0.65 (0.91)	C (D)	0.66 (0.90)	C (D)	

14		Kerr Street & Rail Track									
	Future Total (Phase 1)		Future Total (Phase 1)		Future Total (Phase 2)		Future Total (Phase 2)		Future Total (Phase 2)		
	With Kerr St Improvements		Without Kerr St Improvements		With Kerr St Improvements		Without Kerr St Improvements		Kerr St Closure		
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	
NBT	0.37 (0.49)	A (A)	0.37 (0.49)	A (A)	0.39 (0.50)	A (A)	0.39 (0.50)	A (A)	-- (--)	-- (--)	
SBT	0.38 (0.43)	A (A)	0.38 (0.43)	A (A)	0.39 (0.45)	A (A)	0.39 (0.45)	A (A)	-- (--)	-- (--)	
Overall	0.30 (0.38)	A (A)	0.30 (0.38)	A (A)	0.31 (0.39)	A (A)	0.31 (0.39)	A (A)	0.00 (0.00)	A (A)	

Unsignalized Intersections Analysis Results

1 Kerr Street & Wycroft Road

	Future Total (Phase 1)		Future Total (Phase 1)		Future Total (Phase 2)		Future Total (Phase 2)		Future Total (Phase 2)	
	With Kerr St Improvements		Without Kerr St Improvements		With Kerr St Improvements		Without Kerr St Improvements		Kerr St Closure	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
EBL	28.9 (32.3)	D (D)	28.9 (32.3)	D (D)	30.5 (34.8)	D (D)	30.5 (34.8)	D (D)	8.9 (9.0)	A (A)
EBR	11.1 (12.0)	B (B)	11.1 (12.0)	B (B)	11.2 (12.3)	B (B)	11.2 (12.3)	B (B)	-- (--)	-- (--)
NBL	9.8 (9.7)	A (A)	9.8 (9.7)	A (A)	9.9 (9.8)	A (A)	9.9 (9.8)	A (A)	-- (--)	-- (--)

7 Kerr Street & Prince Charles Drive

	Future Total (Phase 1)		Future Total (Phase 1)		Future Total (Phase 2)		Future Total (Phase 2)		Future Total (Phase 2)	
	With Kerr St Improvements		Without Kerr St Improvements		With Kerr St Improvements		Without Kerr St Improvements		Kerr St Closure	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
EBLTR	18.8 (25.6)	C (D)	18.8 (25.6)	C (D)	19.1 (26.2)	C (D)	19.1 (26.2)	C (D)	19.3 (22.2)	C (C)
WBLTR	15.8 (19.2)	C (C)	15.8 (19.2)	C (C)	15.9 (19.5)	C (C)	15.9 (19.5)	C (C)	15.5 (17.3)	C (C)
NBLTR	0.2 (0.2)	A (A)	0.2 (0.2)	A (A)	0.2 (0.2)	A (A)	0.2 (0.2)	A (A)	0.2 (0.2)	A (A)
SBLTR	1.6 (0.6)	A (A)	1.6 (0.6)	A (A)	1.6 (0.6)	A (A)	1.6 (0.6)	A (A)	1.6 (0.6)	A (A)

8 Kerr Street & Elmwood Road

	Future Total (Phase 1)		Future Total (Phase 1)		Future Total (Phase 2)		Future Total (Phase 2)		Future Total (Phase 2)	
	With Kerr St Improvements		Without Kerr St Improvements		With Kerr St Improvements		Without Kerr St Improvements		Kerr St Closure	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
EBLTR	16.4 (18.3)	C (C)	16.4 (18.3)	C (C)	16.3 (18.7)	C (C)	16.3 (18.7)	C (C)	16.9 (16.4)	C (C)
NBLT	0.2 (0.2)	A (A)	0.2 (0.2)	A (A)	0.2 (0.2)	A (A)	0.2 (0.2)	A (A)	0.1 (0.2)	A (A)

11 Speers Road & Interim Connection

	Future Total (Phase 1)		Future Total (Phase 1)		Future Total (Phase 2)		Future Total (Phase 2)		Future Total (Phase 2)	
	With Kerr St Improvements		Without Kerr St Improvements		With Kerr St Improvements		Without Kerr St Improvements		Kerr St Closure	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
EBL	9.0 (11.0)	A (B)	9.0 (11.0)	A (B)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
SBL	14.3 (18.7)	B (C)	14.3 (18.7)	B (C)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)	-- (--)
SBR	9.3 (9.7)	A (A)	9.3 (9.7)	A (A)	9.1 (9.6)	A (A)	9.1 (9.6)	A (A)	10.1 (10.2)	B (B)

Queue Analysis Results

	Kerr Street & Shepherd Road									
	Future Total (Phase 1) With Kerr St Improvements		Future Total (Phase 1) Without Kerr St Improvements		Future Total (Phase 2) With Kerr St Improvements		Future Total (Phase 2) Without Kerr St Improvements		Future Total (Phase 2) Kerr St Closure	
	50th Percentile Queues	95th Percentile Queues	50th Percentile Queues	95th Percentile Queues	50th Percentile Queues	95th Percentile Queues	50th Percentile Queues	95th Percentile Queues	50th Percentile Queues	95th Percentile Queues
WBL	9.3 (7.6)	23.0 (20.9)	9.3 (7.6)	23.0 (20.9)	9.7 (8.0)	23.9 (21.6)	9.7 (8.0)	23.9 (21.6)	6.4 (5.5)	18.2 (16.0)
WBTR	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	-- (-)	-- (-)
NBT	8.5 (16.6)	16.3 (31.9)	8.5 (16.6)	16.3 (31.9)	9.3 (17.3)	17.5 (33.5)	9.3 (17.3)	17.5 (33.5)	-- (-)	-- (-)
NBR	0.0 (0.0)	4.9 (7.6)	0.0 (0.0)	4.9 (7.6)	0.0 (0.0)	4.9 (7.6)	0.0 (0.0)	4.9 (7.6)	0.0 (0.0)	0.0 (0.0)
SBL	2.4 (4.1)	6.8 (11.2)	2.4 (4.1)	6.8 (11.2)	2.4 (4.2)	6.9 (11.5)	2.4 (4.2)	6.9 (11.5)	-- (-)	-- (-)
SBT	6.7 (7.1)	13.4 (14.8)	6.7 (7.1)	13.4 (14.8)	7.0 (7.7)	14.0 (16.1)	7.0 (7.7)	14.0 (16.1)	-- (-)	-- (-)
3	Kerr Street & Speers Road									
	Future Total (Phase 1) With Kerr St Improvements		Future Total (Phase 1) Without Kerr St Improvements		Future Total (Phase 2) With Kerr St Improvements		Future Total (Phase 2) Without Kerr St Improvements		Future Total (Phase 2) Kerr St Closure	
EBL	6.8 (10.9)	15.0 (22.0)	6.7 (10.9)	15.0 (22.0)	9.5 (11.8)	19.4 (26.0)	9.5 (11.8)	19.4 (26.0)	2.6 (2.9)	8.6 (6.5)
EBT	102.9 (55.5)	123.0 (81.6)	102.9 (55.5)	123.0 (81.6)	111.0 (53.1)	130.2 (94.4)	111.0 (53.1)	130.2 (94.4)	51.5 (58.2)	136.1 (98.0)
EBR	1.6 (9.4)	6.4 (21.0)	1.6 (9.4)	6.4 (21.0)	1.5 (8.8)	7.9 (20.0)	1.5 (8.8)	7.9 (20.0)	0.8 (10.3)	12.3 (21.5)
WBL	31.7 (33.2)	68.1 (57.7)	29.7 (33.2)	66.3 (57.7)	31.8 (34.1)	76.2 (68.0)	29.8 (34.1)	74.1 (68.0)	20.1 (34.1)	37.1 (48.2)
WBT	63.2 (81.9)	80.8 (119.8)	60.0 (81.9)	80.8 (119.8)	65.8 (87.8)	82.5 (128.5)	62.3 (87.8)	82.5 (128.5)	49.2 (96.4)	70.8 (114.8)
WBR	0.0 (0.0)	13.6 (19.3)	0.0 (0.0)	13.6 (19.3)	0.0 (0.0)	13.6 (20.2)	0.0 (0.0)	13.6 (20.2)	0.0 (0.0)	0.0 (9.2)
NBL	15.8 (26.8)	24.1 (39.3)	16.8 (26.8)	24.1 (39.3)	15.7 (27.4)	24.1 (39.5)	16.7 (27.4)	24.1 (39.5)	31.8 (47.0)	42.6 (72.1)
NBT	24.9 (34.9)	39.1 (51.8)	26.8 (34.9)	39.1 (51.8)	24.8 (35.6)	39.1 (52.6)	26.7 (35.6)	39.1 (52.6)	7.0 (8.8)	14.4 (3.8)
NBR	61.0 (1.6)	97.0 (22.2)	47.7 (0.0)	75.5 (20.1)	61.3 (2.5)	98.3 (22.9)	47.8 (0.0)	75.8 (19.7)	6.2 (0.0)	30.2 (18.0)
SBL	44.3 (32.6)	56.1 (47.8)	61.8 (50.1)	73.7 (67.3)	44.3 (32.6)	56.1 (47.8)	61.6 (49.4)	73.7 (65.8)	13.1 (0.0)	20.8 (0.0)
SBT	28.0 (56.8)	40.3 (78.7)	29.4 (56.8)	40.3 (78.7)	28.8 (58.9)	41.5 (80.6)	30.2 (58.9)	41.5 (80.6)	6.9 (24.3)	13.8 (41.9)
SBR	0.0 (0.0)	9.7 (12.4)	0.0 (0.0)	9.7 (12.4)	0.0 (0.0)	10.3 (13.4)	0.0 (0.0)	10.3 (13.4)	0.0 (0.0)	9.4 (0.0)
4	Dorval Road & Speers Road									
	Future Total (Phase 1) With Kerr St Improvements		Future Total (Phase 1) Without Kerr St Improvements		Future Total (Phase 2) With Kerr St Improvements		Future Total (Phase 2) Without Kerr St Improvements		Future Total (Phase 2) Kerr St Closure	
EBL	54.8 (59.7)	85.1 (91.8)	54.8 (59.7)	85.1 (91.8)	54.8 (59.7)	85.1 (91.8)	54.8 (59.7)	85.1 (91.8)	56.4 (65.2)	88.1 (97.8)
EBT	71.4 (56.6)	79.0 (73.1)	71.4 (56.6)	79.0 (73.1)	74.3 (57.5)	83.0 (74.6)	74.3 (57.5)	83.0 (74.6)	74.5 (55.1)	83.0 (71.6)
EBR	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
WBL	5.2 (29.2)	7.8 (53.4)	5.2 (29.2)	7.8 (53.4)	9.2 (33.9)	17.7 (63.0)	6.9 (33.9)	17.7 (63.0)	14.2 (35.1)	13.1 (38.3)
WBT	33.2 (77.8)	42.6 (108.5)	37.3 (77.8)	42.6 (108.5)	56.0 (89.1)	75.4 (120.2)	55.9 (89.1)	75.4 (120.2)	51.7 (90.4)	65.4 (84.3)
WBR	18.6 (42.3)	34.2 (87.4)	26.7 (42.3)	34.2 (87.4)	34.7 (52.8)	63.4 (115.0)	43.2 (52.8)	63.4 (115.0)	62.5 (126.6)	98.4 (204.2)
NBL	8.3 (9.1)	19.6 (17.7)	8.3 (9.1)	19.6 (17.7)	8.5 (9.2)	19.6 (17.7)	8.5 (9.2)	19.6 (17.7)	8.4 (9.1)	19.6 (17.7)
NBTR	123.9 (86.0)	165.4 (108.8)	123.9 (86.0)	165.4 (108.8)	129.7 (90.1)	174.3 (113.5)	129.7 (90.1)	174.3 (113.5)	131.6 (91.9)	177.2 (115.6)
SBL	30.4 (30.6)	141.0 (100.9)	30.4 (30.6)	141.0 (100.9)	37.1 (47.1)	143.3 (118.8)	37.1 (47.1)	143.3 (118.8)	104.4 (127.2)	206.8 (194.7)
SBT	35.4 (63.5)	45.6 (28.0)	35.4 (63.5)	45.6 (28.0)	38.9 (62.5)	46.8 (31.2)	38.9 (62.5)	46.8 (31.2)	45.9 (70.6)	62.5 (45.6)
SBR	10.1 (6.4)	16.4 (3.2)	10.1 (6.4)	16.4 (3.2)	10.9 (4.6)	15.0 (4.1)	10.9 (4.6)	15.0 (4.1)	14.2 (12.1)	26.5 (3.5)
5	St. Augustine Drive & Speers Road									
	Future Total (Phase 1) With Kerr St Improvements		Future Total (Phase 1) Without Kerr St Improvements		Future Total (Phase 2) With Kerr St Improvements		Future Total (Phase 2) Without Kerr St Improvements		Future Total (Phase 2) Kerr St Closure	
EBL	0.2 (0.2)	0.3 (0.3)	0.2 (0.2)	0.3 (0.3)	0.8 (2.2)	1.6 (3.2)	0.8 (2.2)	1.6 (3.2)	1.3 (2.5)	1.9 (1.7)
EBTR	16.4 (9.6)	20.3 (8.8)	16.4 (9.6)	20.3 (8.8)	15.0 (12.8)	21.8 (13.4)	15.0 (12.8)	21.8 (13.4)	16.9 (9.4)	17.8 (3.4)
WBTR	48.0 (90.6)	55.4 (2.0)	31.6 (90.6)	55.4 (2.0)	36.6 (101.3)	48.2 (138.6)	20.0 (101.3)	48.2 (138.6)	17.5 (117.3)	20.3 (67.7)
NBR	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
SBL	0.0 (1.2)	0.0 (5.3)	0.0 (1.2)	0.0 (5.3)	20.8 (11.9)	35.4 (24.0)	20.8 (11.9)	35.4 (24.0)	9.2 (6.0)	19.4 (14.9)
SBTR	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	6.0 (4.9)
6	Speers Road/Corwall Road & Cross Avenue									
	Future Total (Phase 1) With Kerr St Improvements		Future Total (Phase 1) Without Kerr St Improvements		Future Total (Phase 2) With Kerr St Improvements		Future Total (Phase 2) Without Kerr St Improvements		Future Total (Phase 2) Kerr St Closure	
EBL	9.4 (29.5)	14.5 (65.9)	9.4 (29.5)	14.5 (65.9)	9.4 (33.4)	14.5 (70.2)	9.4 (33.4)	14.5 (70.2)	5.9 (7.7)	9.3 (14.0)
EBT	44.7 (21.0)	53.4 (36.2)	44.7 (21.0)	53.4 (36.2)	46.8 (21.8)	55.7 (37.3)	46.8 (21.8)	55.7 (37.3)	39.2 (14.3)	45.4 (21.3)
WBTR	33.1 (120.8)	43.1 (161.1)	33.1 (120.8)	43.1 (161.1)	33.8 (128.8)	44.0 (166.8)	33.8 (128.8)	44.0 (166.8)	27.7 (66.1)	35.3 (99.9)
SBL	1.6 (2.6)	5.7 (7.8)	1.6 (2.6)	5.7 (7.8)	1.6 (2.6)	5.7 (7.8)	1.6 (2.6)	5.7 (7.8)	1.6 (2.7)	5.8 (8.3)
SBR	0.0 (21.2)	11.7 (40.0)	0.0 (21.2)	11.7 (40.0)	0.0 (21.9)	11.7 (40.7)	0.0 (21.9)	11.7 (40.7)	0.0 (1.9)	11.1 (17.8)
9	Kerr Street & Stewart Street									
	Future Total (Phase 1) With Kerr St Improvements		Future Total (Phase 1) Without Kerr St Improvements		Future Total (Phase 2) With Kerr St Improvements		Future Total (Phase 2) Without Kerr St Improvements		Future Total (Phase 2) Kerr St Closure	
EBLTR	9.6 (8.5)	15.4 (16.5)	9.6 (8.5)	15.4 (16.5)	9.6 (8.5)	15.4 (16.5)	9.6 (8.5)	15.4 (16.5)	9.6 (8.5)	15.4 (16.5)
WBLTR	8.7 (3.4)	16.8 (13.0)	8.7 (3.4)	16.8 (13.0)	8.7 (3.4)	16.8 (13.0)	8.7 (3.4)	16.8 (13.0)	8.7 (3.4)	16.8 (13.0)
NBLTR	24.6 (18.6)	61.6 (55.3)	24.6 (18.6)	61.6 (55.3)	24.6 (19.2)	61.6 (56.9)	24.6 (19.2)	61.6 (56.9)	21.9 (16.0)	55.5 (48.1)
SBLTR	18.0 (32.3)	47.8 (98.2)	18.0 (32.3)	47.8 (98.2)	18.8 (33.6)	49.6 (102.4)	18.8 (33.6)	49.6 (102.4)	13.6 (25.7)	37.3 (78.1)
10	Dorval Road & Wycroft Road									
	Future Total (Phase 1) With Kerr St Improvements		Future Total (Phase 1) Without Kerr St Improvements		Future Total (Phase 2) With Kerr St Improvements		Future Total (Phase 2) Without Kerr St Improvements		Future Total (Phase 2) Kerr St Closure	
EBL	27.0 (51.2)	40.0 (82.7)	27.0 (51.2)	40.0 (82.7)	27.0 (51.2)	40.0 (82.7)	27.0 (51.2)	40.0 (82.7)	27.0 (51.2)	40.0 (82.7)
EBTR	11.5 (30.1)	24.1 (45.1)	11.5 (30.1)	24.1 (45.1)	11.9 (30.0)	24.5 (45.1)	11.9 (30.0)	24.5 (45.1)	7.2 (18.6)	18.8 (32.8)
WBL	3.7 (11.0)	9.1 (19.8)	3.7 (11.0)	9.1 (19.8)	3.6 (10.9)	9.0 (19.8)	3.6 (10.9)	9.0 (19.8)	3.8 (12.4)	9.8 (22.0)
WBT	17.1 (21.9)	31.3 (36.6)	17.1 (21.9)	31.3 (36.6)	18.3 (23.0)	32.5 (38.3)	18.3 (23.0)	32.5 (38.3)	8.3 (13.5)	18.9 (25.5)
WBR	0.0 (89.9)	0.0 (127.6)	0.0 (89.9)	0.0 (127.6)	0.0 (91.0)	0.0 (129.7)	0.0 (91.0)	0.0 (129.7)	0.0 (73.7)	0.0 (98.0)
NBL	8.2 (8.2)	13.1 (11.4)	8.2 (8.2)	13.1 (11.4)	8.6 (7.9)	12.9 (11.2)	8.6 (7.9)	12.9 (11.2)	11.8 (7.2)	12.9 (9.6)
NBTR	92.9 (135.2)	128.5 (160.4)	90.6 (135.2)	128.5 (160.4)	97.6 (136.7)	142.9 (162.4)	97.6 (136.7)	142.9 (162.4)	111.3 (148.4)	124.2 (184.3)
SBL	18.8 (12.6)	28.7 (21.8)	18.8 (12.6)	28.7 (21.8)	18.8 (13.8)	28.7 (23.2)	18.8 (13.8)	28.7 (23.2)	13.8 (6.5)	22.7 (12.2)
SBTR	101.1 (91.3)	140.3 (126.8)	101.1 (91.3)	140.3 (126.8)	105.3 (96.5)	146.5 (132.7)	105.3 (96.5)	146.5 (132.7)	115.7 (109.8)	152.7 (151.5)
14	Kerr Street & Rail Track									
	Future Total (Phase 1) With Kerr St Improvements		Future Total (Phase 1) Without Kerr St Improvements		Future Total (Phase 2) With Kerr St Improvements		Future Total (Phase 2) Without Kerr St Improvements		Future Total (Phase 2) Kerr St Closure	
NBT	57.3 (85.4)	73.3 (107.7)	57.3 (85.4)	73.3 (107.7)	60.7 (88.4)	77.5 (111.6)	60.7 (88.4)	77.5 (111.6)	-- (-)	-- (-)
SBT	58.5 (71.2)	75.0 (90.5)	58.5 (71.2)	75.0 (90.5)	60.3 (75.8)	77.1 (95.9)	60.3 (75.8)	77.1 (95.9)	-- (-)	-- (-)

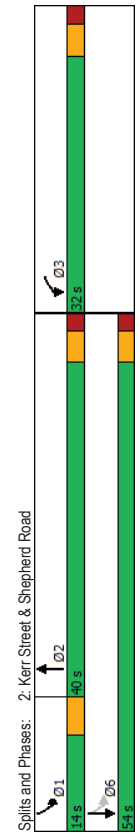
APPENDIX J:
Capacity Analyses Worksheets – Synchro Analyses

Existing AM
Upper Kerr Village (8/24-01)
HCM Unsignalized Intersection Capacity Analysis
1: Kerr Street & Wycroft Road

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W	W	W	W	W	W
Traffic Volume (veh/h)	5	80	160	300	475	125
Future Volume (Veh/h)	5	80	160	300	475	125
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	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	319	505	133
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	1230	572	638			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	1230	572	638			
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)	3.5	3.3	2.2			
p0 queue free %	97	84	82			
CM capacity (veh/h)	162	518	946			
Direction_Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	90	170	319	638		
Volume Left	5	170	0	0		
Volume Right	85	0	0	133		
cSH	462	946	1700	1700		
Volume to Capacity	0.19	0.18	0.19	0.38		
Queue Length 95th (m)	5.4	5.0	0.0	0.0		
Control Delay (s)	14.7	9.6	0.0	0.0		
Lane LOS	B	A	A	A		
Approach Delay (s)	14.7	3.4		0.0		
Approach LOS	B	A		A		
Intersection Summary						
Average Delay	2.4					
Intersection Capacity Utilization	56.7%					
Analysis Period (min)	15					
ICU Level of Service	B					

Existing AM
Upper Kerr Village (8/24-01)
Timings
2: Kerr Street & Shepherd Road

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations	W	W	W	W
Traffic Volume (vph)	95	240	90	410
Future Volume (vph)	95	240	90	410
Turn Type	Prot	NA	pm-pt	NA
Protected Phases	3	2	1	6
Permitted Phases	3	2	1	6
Detector Phase				
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	0.0
Total Lost Time (s)	5.4	5.2		5.2
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	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: 41.3				
Natural Cycle: 75				
Control Type: Semi Act-Uncoord				



Queues
2: Kerr Street & Shepherd Road

HCM Signalized Intersection Capacity Analysis
2: Kerr Street & Shepherd Road

Existing AM
Upper Kerr Village (8/24-01)

Existing AM
Upper Kerr Village (8/24-01)

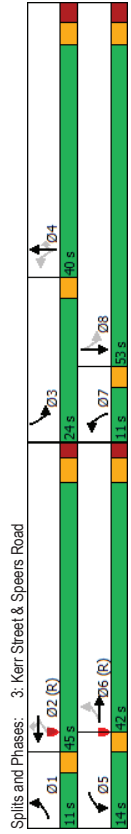
	WBL	NBT	SBT
Lane Group	335	324	550
Lane Group Flow (vph)	0.60	0.21	0.41
v/c Ratio	12.9	6.6	8.9
Control Delay	0.0	0.0	0.0
Queue Delay	12.9	6.6	8.9
Total Delay	10.9	5.1	11.1
Queue Length 50th (m)	31.7	13.1	25.3
Queue Length 95th (m)	241.3	143.2	2.5
Internal Link Dist (m)			
Turn Bay Length (m)			
Base Capacity (vph)	1111	2864	2898
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.30	0.11	0.19
Intersection Summary			

	WBL	WBR	NBT	NBR	SBL	SBT
Movement						
Lane Configurations	W		T	T		T
Traffic Volume (vph)	95	210	240	55	90	410
Future Volume (vph)	95	210	240	55	90	410
Ideal Flow (vphpb)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4		5.2			5.2
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	0.95
Fpb. ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flt	0.91	0.97	1.00	1.00	1.00	1.00
Flt Protected						
Satd. Flow (prot)	1639	3366	3366	3484	3484	3484
Flt Permitted	0.98	1.00	1.00	0.83	0.83	0.83
Satd. Flow (perm)	1639	3366	3366	2914	2914	2914
Peak-Hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	104	231	264	60	99	451
RTOR Reduction (vph)	97	0	20	0	0	0
Lane Group Flow (vph)	238	0	304	0	0	550
Confl. Peds. (#/hr)	5	5	5	5	5	5
Heavy Vehicles (%)	8%	0%	2%	5%	1%	3%
Bus Blockages (#/hr)	0	0	6	0	0	0
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases					6	
Actuated Green, G (s)	11.6		19.0		19.0	19.0
Effective Green, g (s)	11.6		19.0		19.0	19.0
Actuated g/C Ratio	0.28		0.46		0.46	0.46
Clearance Time (s)	5.4		5.2		5.2	5.2
Vehicle Extension (s)	3.0		3.5		3.5	3.5
Lane Grp Cap (vph)	461		1552		1343	1343
v/s Ratio Prot	c0.15		0.09		c0.19	c0.19
v/s Ratio Perm						
v/c Ratio	0.52		0.20		0.41	0.41
Uniform Delay, d1	12.4		6.6		7.4	7.4
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	1.0		0.1		0.2	0.2
Delay (s)	13.4		6.6		7.6	7.6
Level of Service	B		A		A	A
Approach Delay (s)	13.4		6.6		7.6	7.6
Approach LOS	B		A		A	A
Intersection Summary						
HCM 2000 Control Delay			9.0			A
HCM 2000 Volume to Capacity ratio			0.52			
Actuated Cycle Length (s)			41.2			14.6
Intersection Capacity Utilization			62.8%			B
Analysis Period (min)			15			
c. Critical Lane Group						

Timings 3: Kerr Street & Speers Road Existing AM Upper Kerr Village (8/7/24-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	35	605	180	435	175	95	365	345
Traffic Volume (vph)	35	605	180	435	175	95	365	345
Future Volume (vph)	35	605	180	435	175	95	365	345
Turn Type	pm-pt	NA	pm-pt	NA	pm-pt	NA	pm-pt	NA
Protected Phases	1	6	5	2	2	7	4	8
Permitted Phases	6	2	2	2	2	4	4	8
Detector Phase	1	6	5	2	2	7	4	3
Switch Phase								
Minimum Initial (s)	7.0	25.0	7.0	25.0	7.0	10.0	10.0	7.0
Minimum Split (s)	10.0	30.9	10.0	30.9	10.0	34.3	10.0	34.3
Total Split (s)	11.0	42.0	14.0	45.0	11.0	40.0	24.0	53.0
Total Split (%)	9.2%	35.0%	11.7%	37.5%	9.2%	33.3%	33.3%	20.0%
Maximum Green (s)	8.0	36.1	11.0	39.1	8.0	33.7	33.7	21.0
Yellow Time (s)	3.0	3.7	3.0	3.7	3.0	3.3	3.0	3.3
All-Red Time (s)	0.0	2.2	0.0	2.2	0.0	3.0	3.0	0.0
Lost Time Adjust (s)	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	3.0	6.3	6.3	3.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.5	5.5	2.5	5.5	2.5	4.0	4.0	2.5
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	C-Min	None	C-Min	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	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



Queues 3: Kerr Street & Speers Road Existing AM Upper Kerr Village (8/7/24-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	41	802	209	506	203	110	424	401
v/c Ratio	0.09	0.65	0.64	0.34	0.27	0.31	0.30	0.89
Control Delay	16.4	30.0	28.7	26.1	4.8	22.8	40.8	39.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0
Total Delay	16.4	30.0	28.7	26.1	4.8	22.8	40.8	39.9
Queue Length 50th (m)	3.0	90.2	26.4	43.0	0.0	15.3	22.0	43.5
Queue Length 95th (m)	m7.9	m114.8	#49.2	61.7	13.7	13.7	32.8	70.1
Internal Link Dist (m)	211.8	474.4	75.0	100.0	50.0	103.4	45.0	143.2
Turn Bay Length (m)	105.0	227	328	1484	760	353	517	577
Base Capacity (vph)	466	1227	328	1484	760	353	517	577
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.65	0.64	0.34	0.27	0.31	0.21	0.73

Intersection Summary
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Queues
4: Dorval Road & Speers Road

Existing AM
Upper Kerr Village (8/7/24-01)

	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	451	570	82	326	196	76	924	261	489	277
v/c Ratio	0.84	0.60	0.29	0.54	0.49	0.20	0.93	0.68	0.32	0.36
Control Delay	63.2	39.2	19.6	37.5	11.7	18.8	57.3	33.4	9.8	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.2	39.2	19.6	37.5	11.7	18.8	57.3	33.4	9.8	2.8
Queue Length 50th (m)	53.1	62.8	6.3	39.4	21.3	8.2	109.8	15.7	22.8	6.0
Queue Length 95th (m)	#74.4	69.2	9.0	49.8	31.7	20.5	#148.4	#114.5	39.5	17.6
Internal Link Dist (m)	412.3			472.1		621.6		494.4		
Turn Bay Length (m)	60.0		85.0		55.0	70.0		110.0		
Base Capacity (vph)	566	1166	339	949	544	386	994	385	1516	765
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	0.80	0.49	0.24	0.34	0.36	0.20	0.93	0.68	0.32	0.36
Intersection Summary										
#	95th percentile volume exceeds capacity, queue may be longer.									
	Queue shown is maximum after two cycles.									

HCM Signalized Intersection Capacity Analysis
4: Dorval Road & Speers Road

Existing AM
Upper Kerr Village (8/7/24-01)

	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Movement	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	TT	TT	T	T	T	T	TT	T	TT	T
Traffic Volume (vph)	415	485	40	75	300	180	70	720	130	240
Future Volume (vph)	415	485	40	75	300	180	70	720	130	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0
Lane Util. Factor	0.97	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Fpb. ped/bikes	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	0.98
Fibb. 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	0.99	1.00	1.00	0.85	1.00	0.98	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	3289	1656	3256	1484	1785	3469	1687	3539	1417
Flt Permitted	0.95	1.00	0.44	1.00	1.00	0.47	1.00	0.11	1.00	1.00
Satd. Flow (perm)	3400	3289	763	3256	1484	890	3469	191	3539	1417
Peak-Hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	451	527	43	82	326	196	76	783	141	261
RTOR Reduction (vph)	0	6	0	0	0	127	0	12	0	0
Lane Group Flow (vph)	451	564	0	82	326	69	76	912	0	261
Confl. Peds. (#/hr)	5				5	5		5		5
Heavy Vehicles (%)	3%	8%	9%	9%	10%	7%	1%	2%	0%	7%
Bus Blockages (#/hr)	0	2	0	0	4	0	0	0	0	0
Turn Type	Prot	NA	NA	pm-pt	NA	Perm	pm-pt	NA	pm-pt	NA
Protected Phases	7	4	3	8	8	5	2	1	6	6
Permitted Phases										
Actuated Green, G (s)	19.1	34.2	30.7	22.9	22.9	39.4	33.2	60.0	49.8	49.8
Effective Green, g (s)	19.1	34.2	30.7	22.9	22.9	39.4	33.2	60.0	49.8	49.8
Actuated G/C Ratio	0.16	0.29	0.26	0.19	0.19	0.33	0.28	0.50	0.41	0.41
Clearance Time (s)	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0
Vehicle Extension (s)	3.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0
Lane Grp Cap (vph)	541	937	253	621	283	338	959	379	1468	588
v/s Ratio Prot	c0.13	c0.17	0.02	0.10	0.01	c0.26	c0.13	0.14	0.14	0.08
v/s Ratio Perm	0.83	0.60	0.32	0.52	0.24	0.22	0.95	0.69	0.33	0.20
Uniform Delay, d1	48.9	37.0	35.0	43.7	41.2	28.3	42.6	28.6	23.8	22.3
Progression Factor	1.00	1.00	0.80	0.79	0.79	1.00	1.00	0.93	0.37	0.48
Incremental Delay, d2	10.6	1.6	0.7	1.5	0.9	0.3	19.3	4.2	0.5	0.6
Delay (s)	59.5	38.6	28.8	35.9	33.3	28.6	61.9	30.8	9.2	11.4
Level of Service	E	D	C	D	C	C	E	C	A	B
Approach Delay (s)	E	D	C	D	C	C	E	C	A	B
Approach LOS	D	D	C	C	C	E	E	C	B	B
Intersection Summary										
HCM 2000 Control Delay	39.6									
HCM 2000 Volume to Capacity ratio	0.60									
Actuated Cycle Length (s)	120.0									
Intersection Capacity Utilization	79.0%									
Analysis Period (min)	15									
c. Critical Lane Group										

HCM Unsignalized Intersection Capacity Analysis
5. St. Augustine Drive & Speers Road

Timings
6. Speers Road/Cornwall Road & Cross Avenue

Existing AM
Upper Kerr Village (8/24-01)

Existing AM
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	4	4	4	4	4	0	0	0	0	0	0
Traffic Volume (veh/h)	740	15	0	590	15	0	0	0	20	0	0	0
Future Volume (Veh/h)	740	15	0	590	15	0	0	0	20	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	6	841	17	0	670	17	0	0	23	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
VC, conflicting volume	692		863							434	1139	1558
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	481		863							434	969	1427
IC, single (s)	4.1		4.1							7.0	7.5	6.5
IC, 2 stage (s)												
p0 queue free %	2.2		2.2							3.3	3.5	4.0
p0 queue free %	99		100							100	100	100
CM capacity (veh/h)	996		784							559	182	123
Direction_Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 1	NB 1	SB 1				
Volume Total	6	561	297	447	240	23	0	0				
Volume Left	0	0	0	0	0	0	0	0				
Volume Right	0	0	17	0	17	23	0	0				
cSH	996	1700	1700	1700	1700	559	1700					
Volume to Capacity	0.01	0.33	0.17	0.26	0.14	0.04	0.00					
Queue Length 95th (m)	0.1	0.0	0.0	0.0	0.0	1.0	0.0					
Control Delay (s)	8.6	0.0	0.0	0.0	0.0	11.7	0.0					
Lane LOS	A	A	A	B	A	A	A					
Approach Delay (s)	0.1		0.0		0.0	11.7	0.0					
Approach LOS			B		A							
Intersection Summary												
Average Delay	0.2											
Intersection Capacity Utilization	30.9%											
ICU Level of Service	A											
Analysis Period (min)	15											

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	4	4	4	4	4	0	0	0	0	0	0
Traffic Volume (vph)	185	1125	540	185	1125	540	5	220				
Future Volume (vph)	185	1125	540	185	1125	540	5	220				
Turn Type	pm-pt	NA	NA	NA	NA	NA	Prot	Perm				
Protected Phases	5	2	2	6	4							
Permitted Phases	2	2	2	6	4	4						
Detector Phase	5	2	2	6	4	4						
Switch Phase												
Minimum Initial (s)	6.0	38.0	38.0	10.0	10.0	10.0						
Minimum Split (s)	12.0	47.6	47.6	15.8	15.8	15.8						
Total Split (s)	35.0	109.0	74.0	31.0	31.0	31.0						
Total Split (%)	25.0%	77.9%	57.9%	22.1%	22.1%	22.1%						
Maximum Green (s)	29.0	102.4	67.4	25.2	25.2	25.2						
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3	3.3						
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5	2.5						
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0						
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8	5.8						
Lead/Lag	Lead	Lag	Lag									
Lead-Lag Optimize?	Yes	Yes	Yes									
Vehicle Extension (s)	3.5	5.0	5.0	3.0	3.0	3.0						
Minimum Gap (s)	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						
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0						
Recall Mode	None	C-Min	C-Min	None	None	None						
Walk Time (s)	10.0	10.0	10.0									
Flash Dont Walk (s)	31.0	31.0	31.0									
Pedestrian Calls (#/hr)	5	5	5									
Intersection Summary												
Cycle Length	140											
Actuated Cycle Length	140											
Offset: 99 (71%), Referenced to phase 2:EBTL and 6:WBTL Start of Green												
Natural Cycle: 80												
Control Type: Actuated-Coordinated												
Splits and Phases: 6: Speers Road/Cornwall Road & Cross Avenue												

Queues Existing AM
6: Speers Road/Cornwall Road & Cross Avenue Upper Kerr Village (8/24-01)

	EBL	EBT	WBT	SBL	SBR
Lane Group	218	1324	659	6	259
Lane Group Flow (vph)	0.35	0.46	0.26	0.05	0.60
v/c Ratio	3.6	3.6	6.8	60.8	13.1
Control Delay	0.0	0.0	0.0	0.0	0.0
Queue Delay	3.6	3.6	6.8	60.8	13.1
Total Delay	8.4	39.2	28.4	1.6	0.0
Queue Length 50th (m)	12.9	46.2	36.8	5.8	11.3
Queue Length 95th (m)	474.4	77.5	60.0		
Internal Link Dist (m)	80.0		45.0		
Turn Bay Length (m)	765	2907	2513	324	681
Base Capacity (vph)	0	0	0	0	0
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	0.28	0.46	0.26	0.02	0.38
Intersection Summary					

HCM Signalized Intersection Capacity Analysis Existing AM
6: Speers Road/Cornwall Road & Cross Avenue Upper Kerr Village (8/24-01)

	EBL	EBT	WBT	SBL	SBR
Movement	EBL	EBT	WBT	SBL	SBR
Lane Configurations	185	1125	540	20	5
Traffic Volume (vph)	185	1125	540	20	5
Future Volume (vph)	1900	1900	1900	1900	1900
Ideal Flow (vphpb)	6.0	6.6	6.6	5.8	5.8
Total Lost time (s)	1.00	0.95	0.95	1.00	0.88
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	1.00	1.00	0.99	1.00	0.85
Frt	0.95	1.00	1.00	0.95	1.00
Flt Protected	1685	3471	3447	1805	2608
Satd. Flow (prot)	0.37	1.00	1.00	0.95	1.00
Flt Permitted	656	3471	3447	1805	2608
Satd. Flow (perm)	0.85	0.85	0.85	0.85	0.85
Peak-Hour factor, PHF	218	1324	635	24	6
Adj. Flow (vph)	0	0	1	0	0
RTOR Reduction (vph)	218	1324	658	0	6
Lane Group Flow (vph)	5		5		19
Confl. Peds. (#/hr)	7%	4%	4%	5%	9%
Heavy Vehicles (%)	pm>pt	NA	NA	Prot	Perm
Turn Type	5	2	6	4	
Protected Phases	2				4
Permitted Phases	117.3	117.3	102.0	10.3	10.3
Actuated Green, G (s)	117.3	117.3	102.0	10.3	10.3
Effective Green, g (s)	0.84	0.84	0.73	0.07	0.07
Actuated g/C Ratio	6.0	6.6	6.6	5.8	5.8
Clearance Time (s)	3.5	5.0	5.0	3.0	3.0
Vehicle Extension (s)	617	2908	2511	132	191
Lane Grp Cap (vph)	0.02	c0.38	0.19	0.00	
v/s Ratio Prot	0.27				c0.01
v/c Ratio Perm	0.35	0.46	0.26	0.05	0.10
Uniform Delay, d1	2.5	3.0	6.4	60.3	60.5
Progression Factor	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.5	0.3	0.1	0.2
Delay (s)	2.9	3.5	6.6	60.4	60.8
Level of Service	A	A	A	E	E
Approach Delay (s)	3.4	6.6	60.7		
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	0.45				
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					

7: Kerr Street & Prince Charles Drive

8: Kerr Street & Elmwood Road

Existing AM Upper Kerr Village (8/24-01)

Existing AM Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	0	5	0	0	40	5	510	5	40	345	5
Traffic Volume (veh/h)	5	0	5	0	0	40	5	510	5	40	345	5
Future Volume (Veh/h)	5	0	5	0	0	40	5	510	5	40	345	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	6	0	6	0	0	48	6	607	6	48	411	6
Pedestrians	15			30								
Lane Width (m)	3.6			3.6								
Walking Speed (m/s)	1.1			1.1								
Percent Blockage	1			3								
Right turn flare (veh)												
Median type							None	None	None	None	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	1195	1180	429	1168	1180	640	432			643		
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	923	907	269	894	907	544	272			547		
IC, single (s)	7.1	6.5	6.5	7.1	6.5	6.3	4.3			4.2		
IC, 2 stage (s)												
p0 queue free %	3.5	4.0	3.6	3.5	4.0	3.4	2.3			2.3		
IF (s)	97	100	99	97	100	90	99			95		
CM capacity (veh/h)	190	230	601	216	230	458	1042			873		
Direction, Lane #	EB 1	WB 1	NB 1	NB 1	SB 1							
Volume Total	12	54	619	465								
Volume Left	6	6	6	48								
Volume Right	6	48	6	6								
cSH	288	408	1042	873								
Volume to Capacity	0.04	0.13	0.01	0.05								
Queue Length 95th (m)	1.0	3.4	0.1	1.3								
Control Delay (s)	18.0	15.2	0.2	1.6								
Lane LOS	C	C	A	A								
Approach Delay (s)	18.0	15.2	0.2	1.6								
Approach LOS	C	C	C	C								
Intersection Summary												
Average Delay	1.6											
Intersection Capacity Utilization	55.0%											
Analysis Period (min)	15											
	ICU Level of Service											
	B											

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W					
Traffic Volume (veh/h)	20	10	5	490	315	30
Future Volume (Veh/h)	20	10	5	490	315	30
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	24	12	6	576	371	35
Pedestrians	20			5		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	2			0		
Right turn flare (veh)						
Median type				None	None	None
Median storage (veh)						
Upstream signal (m)				103	262	
pX platoon unblocked	0.89	0.97	0.97			
VC, conflicting volume	996	414	426			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	861	382	395			
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
p0 queue free %	92	98	99			
IF (s)	284	636	1121			
CM capacity (veh/h)						
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	36	582	406			
Volume Left	24	6	0			
Volume Right	12	0	35			
cSH	349	1121	1700			
Volume to Capacity	0.10	0.01	0.24			
Queue Length 95th (m)	2.6	0.1	0.0			
Control Delay (s)	16.5	0.2	0.0			
Lane LOS	C	A	A			
Approach Delay (s)	16.5	0.2	0.0			
Approach LOS	C	C	C			
Intersection Summary						
Average Delay	0.7					
Intersection Capacity Utilization	41.3%					
Analysis Period (min)	15					
	ICU Level of Service					
	A					

Timings 9: Kerr Street & Stewart Street

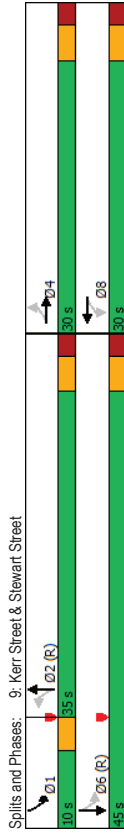
Queues 9: Kerr Street & Stewart Street

Existing AM
Upper Kerr Village (8/24-01)

Existing AM
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	35	25	15	35	5	385	40	245
Traffic Volume (vph)	35	25	15	35	5	385	40	245
Future Volume (vph)	Perm	NA	Perm	NA	Perm	NA	prn+pt	NA
Turn Type	4		8		2		2	6
Protected Phases	4		8		2		2	6
Permitted Phases	4		8		2		2	6
Detector Phase	4		8		2		2	6
Switch Phase	4		8		2		2	6
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	0.0	0.0
Total Lost Time (s)	5.4		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:NBT and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated



	EBT	WBT	NBT	SBT
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	79	146	500	385
v/c Ratio	0.27	0.38	0.43	0.38
Control Delay	23.8	13.5	9.1	8.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.8	13.5	9.1	8.5
Queue Length 50th (m)	9.6	7.9	21.7	15.5
Queue Length 95th (m)	15.4	15.9	55.5	41.8
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)				
Base Capacity (vph)	463	564	1156	1025
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	0.17	0.26	0.43	0.38

Intersection Summary

9: Kerr Street & Stewart Street

Existing AM
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	35	25	5	15	35	70	5	385	20	40	245	30
Traffic Volume (vph)	35	25	5	15	35	70	5	385	20	40	245	30
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Frt	0.97	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	1700	1607	1773	1773	1773	1773	1773	1773	1773	1773	1773	1773
Satd. Flow (prot)	0.80	0.96	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Permitted	1402	1549	1767	1767	1767	1767	1767	1767	1767	1767	1767	1767
Satd. Flow (perm)	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Peak-hour factor, PHF	43	30	6	18	43	85	6	470	24	49	299	37
Adj. Flow (vph)	0	5	0	0	68	0	0	1	0	0	4	0
RTOR Reduction (vph)	0	74	0	0	78	0	0	499	0	0	381	0
Lane Group Flow (vph)	20	20	20	20	20	30	35	35	35	35	30	30
Confl. Peds. (#/hr)	2%	7%	16%	0%	5%	4%	28%	6%	0%	2%	6%	6%
Heavy Vehicles (%)	0	2	0	0	2	0	0	0	0	0	0	4
Bus Blockages (#/hr)	Perm	NA	NA	Perm	NA	Perm	NA	NA	pm-pt	NA	NA	NA
Turn Type	4	8	2	8	8	2	2	2	1	6	6	6
Protected Phases	15.2	15.2	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0
Actuated Green, G (s)	0.20	0.20	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Effective Green, g (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Actuated g/C Ratio	284	313	1154	1154	1154	1154	1154	1154	1154	1154	1154	1154
Clearance Time (s)	c0.05	0.05	c0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Vehicle Extension (s)	0.26	0.25	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Lane Grp Cap. (vph)	25.2	25.1	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
v/s Ratio Prot	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
v/s Ratio Perm	0.7	0.6	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Uniform Delay, d1	25.8	25.7	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Progression Factor	C	C	A	A	A	A	A	A	A	A	A	A
Incremental Delay, d2	25.8	25.7	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Delay (s)	25.8	25.7	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Level of Service	C	C	A	A	A	A	A	A	A	A	A	A
Approach Delay (s)	25.8	25.7	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Approach LOS	C	C	A	A	A	A	A	A	A	A	A	A
Intersection Summary	<p>Intersection Summary</p> <p>Control Type: Actuated-Coordinated</p> <p>Actuated Cycle Length: 120</p> <p>Offset: 118 (98%), Referenced to phase 2:NETL and 6:SBT, Start of Green</p> <p>Natural Cycle: 90</p> <p>Spits and Phases: 10: Donval Road & Wyecroft Road</p> <p>Phase 1: 17 s (L), 17 s (R)</p> <p>Phase 2: 21 s (L), 21 s (R)</p> <p>Phase 3: 21 s (L), 21 s (R)</p> <p>Phase 4: 17 s (L), 17 s (R)</p>											

10: Donval Road & Wyecroft Road

Existing AM
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	17	4	3	8	8	2	2	5	2	1	6	6
Traffic Volume (vph)	215	115	20	120	110	1110	145	905	145	905	145	905
Future Volume (vph)	215	115	20	120	110	1110	145	905	145	905	145	905
Ideal Flow (vphpl)	7	4	3	8	8	2	2	5	2	1	6	6
Total Lost time (s)	17.5%	33.3%	17.5%	33.3%	14.2%	35.0%	14.2%	35.0%	14.2%	35.0%	14.2%	35.0%
Maximum Green (s)	16.0	33.0	16.0	33.0	12.0	35.0	12.0	35.0	12.0	35.0	12.0	35.0
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	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)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Lead/Lag	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead-Lag Optimize?	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (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
Time Before Reduce (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
Time To Reduce (s)	None	None	None	None	None	None	None	None	None	None	None	None
Recall Mode	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Walk Time (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Flash Dont Walk (s)	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Intersection Summary	<p>Intersection Summary</p> <p>Control Type: Actuated-Coordinated</p> <p>Actuated Cycle Length: 120</p> <p>Offset: 118 (98%), Referenced to phase 2:NETL and 6:SBT, Start of Green</p> <p>Natural Cycle: 90</p> <p>Spits and Phases: 10: Donval Road & Wyecroft Road</p> <p>Phase 1: 17 s (L), 17 s (R)</p> <p>Phase 2: 21 s (L), 21 s (R)</p> <p>Phase 3: 21 s (L), 21 s (R)</p> <p>Phase 4: 17 s (L), 17 s (R)</p>											

Queues
10: Dorval Road & Wynecroft Road

Existing AM
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	234	239	22	347	120	1272	158	1462
Lane Group Flow (vph)	0.60	0.30	0.09	0.64	0.50	0.55	0.44	0.65
v/c Ratio	56.6	21.4	29.4	24.0	20.1	10.9	53.6	25.3
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	56.6	21.4	29.4	24.0	20.1	10.9	53.6	25.3
Total Delay	27.0	11.6	3.7	15.2	4.8	65.8	18.2	87.6
Queue Length 50th (m)	40.0	24.4	9.2	29.0	m7.2	m88.1	28.0	122.6
Queue Length 95th (m)	155.6	145.0	199.3	494.4	65.0	125.0	672.1	125.0
Internal Link Dist (m)	416	928	351	1020	259	2309	379	2238
Turn Bay Length (m)	0	0	0	0	0	0	0	0
Base Capacity (vph)	0	0	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0.56	0.26	0.06	0.34	0.46	0.55	0.42	0.65
Reduced v/c Ratio	Intersection Summary							
m	Volume for 95th percentile queue is metered by upstream signal.							

HCM Signalized Intersection Capacity Analysis
10: Dorval Road & Wynecroft Road

Existing AM
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Movement	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	TT	TT	T	T	TT	TT	TT	TT
Traffic Volume (vph)	215	115	105	20	120	200	110	1110
Future Volume (vph)	215	115	105	20	120	200	110	1110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Lane Util. Factor	0.97	0.95	1.00	0.95	1.00	0.91	0.97	0.91
Fpb. ped/bikes	1.00	0.99	1.00	0.99	1.00	1.00	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.93	1.00	0.91	1.00	0.99	1.00	0.95
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3127	3066	1637	3141	1641	5029	3433	4649
Flt Permitted	0.95	1.00	0.60	1.00	0.10	1.00	0.95	1.00
Satd. Flow (perm)	3127	3066	1039	3141	180	5029	3433	4649
Peak-Hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	234	125	114	22	130	217	120	1207
RTOR Reduction (vph)	0	88	0	0	188	0	4	0
Lane Group Flow (vph)	234	151	0	22	159	0	120	1268
Confl. Peds. (#/hr)	2	3	3	3	2	1	2	1
Heavy Vehicles (%)	12%	7%	9%	10%	5%	2%	10%	2%
Bus Blockages (#/hr)	0	2	0	0	0	0	3	0
Turn Type	Prot	NA	NA	pm-pt	NA	pm-pt	NA	Prot
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	8	8	8	8	2	2	2	2
Actuated Green, G (s)	14.9	27.3	20.2	16.3	63.5	52.1	12.7	53.4
Effective Green, g (s)	14.9	27.3	20.2	16.3	63.5	52.1	12.7	53.4
Actuated g/C Ratio	0.12	0.23	0.17	0.14	0.53	0.43	0.11	0.44
Clearance Time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	388	697	194	426	234	2183	363	2068
v/s Ratio Prot	c0.07	0.05	0.00	c0.05	c0.05	0.25	0.05	c0.30
v/s Ratio Perm	0.02	0.02	0.02	0.02	0.22	0.22	0.05	0.30
v/c Ratio	0.60	0.22	0.11	0.37	0.51	0.58	0.44	0.68
Uniform Delay, d1	49.8	37.7	42.1	47.2	17.2	25.7	50.3	26.5
Progression Factor	1.00	1.00	1.00	1.00	1.20	0.42	1.00	1.00
Incremental Delay, d2	3.9	0.3	0.5	1.2	2.1	0.6	1.7	1.8
Delay (s)	53.6	38.0	42.6	48.4	22.7	11.4	52.0	28.3
Level of Service	D	D	D	D	C	B	D	C
Approach Delay (s)	45.7	48.0	48.0	48.0	12.4	12.4	30.6	30.6
Approach LOS	D	D	D	D	B	B	C	C
Intersection Summary	Intersection Summary							
HCM 2000 Control Delay	27.6		HCM 2000 Level of Service		C			
HCM 2000 Volume to Capacity ratio	0.60							
Actuated Cycle Length (s)	120.0							
Sum of lost time (s)	24.0							
Intersection Capacity Utilization	70.8%							
ICU Level of Service	C							
Analysis Period (min)	15							
Critical Lane Group	c							

HCM Unsignalized Intersection Capacity Analysis
 1: Kerr Street & Wycroft Road

Existing PM
 Upper Kerr Village (8/24-01)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W	T	T	T	T	T
Traffic Volume (veh/h)	25	110	100	635	490	110
Future Volume (Veh/h)	25	110	100	635	490	110
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	27	118	108	683	527	118
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None	None	None	None
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
VC, conflicting volume	1490	591	650			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	1490	591	650			
IC, single (s)	6.4	6.2	4.2			
IC, 2 stage (s)						
IF (s)	3.5	3.3	2.3			
p0 queue free %	78	76	88			
CM capacity (veh/h)	121	501	913			
Direction_Lane #	EB 1	NB 1	NB 2	SB 1		
Volume Total	145	108	683	645		
Volume Left	27	108	0	0		
Volume Right	118	0	0	118		
cSH	316	913	1700	1700		
Volume to Capacity	0.46	0.12	0.40	0.38		
Queue Length 95th (m)	17.5	3.0	0.0	0.0		
Control Delay (s)	25.7	9.5	0.0	0.0		
Lane LOS	D	A				
Approach Delay (s)	25.7	1.3		0.0		
Approach LOS	D					
Intersection Summary						
Average Delay	3.0					
Intersection Capacity Utilization	56.3%					
ICU Level of Service	B					
Analysis Period (min)	15					

Timings
 2: Kerr Street & Shepherd Road

Existing PM
 Upper Kerr Village (8/24-01)

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations	W	T	T	T
Traffic Volume (vph)	90	540	155	410
Future Volume (vph)	90	540	155	410
Turn Type	Prot	NA	pm-pt	NA
Protected Phases	3	2	1	6
Permitted Phases	3	2	1	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	0.0
Total Lost Time (s)	5.4	5.2		5.2
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	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: 41.9				
Natural Cycle: 75				
Control Type: Semi Ad-Uncoord				



Queues
2: Kerr Street & Shepherd Road

HCM Signalized Intersection Capacity Analysis
2: Kerr Street & Shepherd Road

Existing PM
Upper Kerr Village (8/24-01)

Existing PM
Upper Kerr Village (8/24-01)

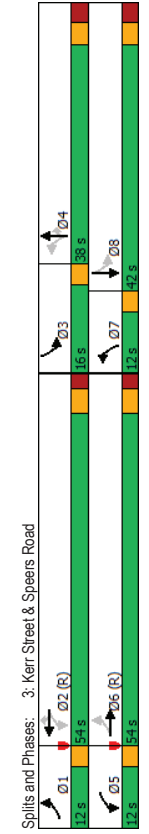
	WBL	NBT	SBT
Lane Group	242	676	583
Lane Group Flow (vph)	0.47	0.41	0.62
v/c Ratio	11.9	7.7	9.7
Control Delay	0.0	0.0	0.0
Queue Delay	11.9	7.7	9.7
Total Delay	7.6	12.8	12.6
Queue Length 50th (m)	25.5	26.3	27.4
Queue Length 95th (m)	241.3	143.2	2.5
Internal Link Dist (m)			
Turn Bay Length (m)	1104	2888	2343
Base Capacity (vph)	0	0	0
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0.22	0.23	0.25
Reduced v/c Ratio			
Intersection Summary			

	WBL	WBR	NBT	NBR	SBL	SBT
Movement	W					
Lane Configurations	W					
Traffic Volume (vph)	90	145	540	115	155	410
Future Volume (vph)	90	145	540	115	155	410
Ideal Flow (vphpb)	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	
Fpb. ped/bikes	0.99		1.00		1.00	
Fibb. ped/bikes	1.00		1.00		1.00	
Flt	0.92		0.97		1.00	
Flt Protected						
Satd. Flow (prot)	1665		3424		3534	
Flt Permitted						
Satd. Flow (perm)	1665		3424		3534	
Peak-Hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	93	149	557	119	160	423
RTOR Reduction (vph)	71	0	18	0	0	0
Lane Group Flow (vph)	171	0	658	0	0	583
Confl. Peds. (#/hr)	15	5	5	5	5	5
Heavy Vehicles (%)	3%	1%	1%	2%	0%	1%
Bus Blockages (#/hr)	0	0	5	0	0	0
Turn Type	Prot		NA		pm+pt	NA
Protected Phases	3		2		1	6
Permitted Phases					6	
Actuated Green, G (s)	11.1		20.0		20.0	
Effective Green, g (s)	11.1		20.0		20.0	
Actuated g/C Ratio	0.27		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)	443		1642		1138	
v/s Ratio Prot	c0.10		0.19		c0.25	
v/s Ratio Perm						
v/c Ratio	0.39		0.40		0.51	
Uniform Delay, d1	12.5		7.0		7.5	
Progression Factor	1.00		1.00		1.00	
Incremental Delay, d2	0.6		0.2		0.5	
Delay (s)	13.1		7.2		7.9	
Level of Service	B		A		A	
Approach Delay (s)	13.1		7.2		7.9	
Approach LOS	B		A		A	
Intersection Summary						
HCM 2000 Control Delay			8.4			A
HCM 2000 Volume to Capacity ratio			0.54			
Actuated Cycle Length (s)			41.7			14.6
Intersection Capacity Utilization			63.1%			B
Analysis Period (min)			15			
c. Critical Lane Group						

Timings 3: Kerr Street & Speers Road Existing PM Upper Kerr Village (8/7/24-01)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	←	←	←	←	←	←	←	←
Traffic Volume (vph)	60	460	285	750	490	140	220	235
Future Volume (vph)	60	460	285	750	490	140	220	235
Turn Type	pm-pt	NA	pm-pt	NA	pm-pt	NA	pm-pt	NA
Protected Phases	1	6	5	2	7	4	3	8
Permitted Phases	6	2	2	2	4	4	8	8
Detector Phase	1	6	5	2	7	4	4	3
Switch Phase								
Minimum Initial (s)	7.0	25.0	7.0	25.0	7.0	10.0	10.0	7.0
Minimum Split (s)	10.0	30.9	10.0	30.9	10.0	34.3	10.0	34.3
Total Split (s)	12.0	54.0	12.0	54.0	12.0	38.0	16.0	42.0
Total Split (%)	10.0%	45.0%	10.0%	45.0%	10.0%	31.7%	13.3%	35.0%
Maximum Green (s)	9.0	48.1	9.0	48.1	9.0	31.7	13.0	35.7
Yellow Time (s)	3.0	3.7	3.0	3.7	3.0	3.3	3.0	3.3
All-Red Time (s)	0.0	2.2	0.0	2.2	0.0	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
Total Lost Time (s)	3.0	5.9	3.0	5.9	3.0	6.3	3.0	6.3
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.5	5.5	2.5	5.5	2.5	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
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	C-Min	None	C-Min	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	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 3: Kerr Street & Speers Road Existing PM Upper Kerr Village (8/7/24-01)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	63	610	300	789	516	147	232	284
v/c Ratio	0.16	0.41	0.62	0.45	0.52	0.53	0.45	0.65
Control Delay	9.7	21.4	20.1	22.0	3.9	33.7	47.2	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.7	21.4	20.1	22.0	3.9	33.7	47.2	9.1
Queue Length 50th (m)	7.7	50.4	35.3	66.5	0.0	23.0	31.3	0.0
Queue Length 95th (m)	m13.5	m59.6	55.5	90.5	20.4	36.2	46.6	19.2
Internal Link Dist (m)	105.0	211.8	75.0	474.4	100.0	50.0	103.4	143.2
Turn Bay Length (m)	411	1519	486	1770	1000	282	495	563
Base Capacity (vph)	0	0	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.40	0.62	0.45	0.52	0.30	0.41	0.65

Intersection Summary
 m Volume for 95th percentile queue is metered by upstream signal.

3: Kerr Street & Speers Road

Existing PM Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	→	↑	→	→	↑	→	→	↑	→	→	↑	→
Traffic Volume (vph)	60	460	120	285	750	490	140	140	220	270	235	60
Future Volume (vph)	60	460	120	285	750	490	140	140	220	270	235	60
Ideal Flow (vphpt)	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	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	1.00	
Frbp_psd/bikes	1.00	0.99	1.00	1.00	0.94	1.00	1.00	0.93	1.00	0.99		
Frbp_psd/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	3392	1750	3539	1485	1768	1877	1486	1750	1816		
Flt Permitted	0.32	1.00	0.33	1.00	1.00	0.36	1.00	1.00	0.51	1.00		
Satd. Flow (perm)	601	3392	611	3539	1485	674	1877	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	
Adj. Flow (vph)	63	484	126	300	789	516	147	147	232	284	247	63
RTOR Reduction (vph)	0	18	0	0	0	261	0	0	192	0	9	0
Lane Group Flow (vph)	63	592	0	300	789	255	147	147	40	284	301	0
Confl. Peds. (#/hr)	30	5	5	30	35	35	35	35	35	35	35	35
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Bus Blockages (#/hr)	0	4	0	0	0	0	0	3	0	0	0	0
Turn Type	pm-pt	NA	pm-pt	NA	pm-pt	NA	pm-pt	NA	pm-pt	pm-pt	NA	
Protected Phases	1	6	5	2	2	7	4				3	8
Permitted Phases	6	52.4	68.5	59.4	59.4	30.8	20.9	20.9	39.3	36.4		
Actuated Green, G (s)	58.5	52.4	68.5	59.4	59.4	30.8	20.9	20.9	39.3	26.4		
Effective Green, g (s)	58.5	52.4	68.5	59.4	59.4	30.8	20.9	20.9	39.3	26.4		
Actuated G/C Ratio	0.49	0.44	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)	353	1481	473	1751	735	263	326	258	411	399		
v/s Ratio Prot	0.01	0.17	c0.07	0.22	0.05	0.08			c0.09	c0.17		
v/s Ratio Perm	0.08	c0.29	0.17	0.10	0.10	0.03			0.03	0.14		
v/c Ratio	0.18	0.40	0.63	0.45	0.35	0.56	0.45	0.16	0.69	0.76		
Uniform Delay, d1	16.5	23.1	14.3	19.7	18.5	36.4	44.4	42.1	32.6	43.8		
Progression Factor	0.73	0.89	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	0.1	0.7	2.4	0.8	1.3	2.1	1.4	0.4	4.6	8.4		
Delay (s)	12.2	21.3	16.7	20.5	19.8	38.5	45.8	42.5	37.2	52.2		
Level of Service	B	C	B	C	B	D	D	D	D	D		
Approach Delay (s)	20.4		19.6			42.3			45.0			
Approach LOS	C		B			D			D			
Intersection Summary												
HCM 2000 Control Delay	27.7 HCM 2000 Level of Service C											
HCM 2000 Volume to Capacity ratio	0.70											
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												

4: Dorval Road & Speers Road

Existing PM Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	→	↑	→	→	↑	→	→	↑	→	→	↑	→
Traffic Volume (vph)	415	410	195	560	455	65	530	240	595	375		
Future Volume (vph)	415	410	195	560	455	65	530	240	595	375		
Turn Type	pm-pt	NA	pm-pt	NA	pm-pt	NA	pm-pt	NA	pm-pt	NA	pm-pt	NA
Protected Phases	7	4	3	8	8	2	5	2	1	6		
Detector Phase	7	4	3	8	8	5	2	1	6	6		
Switch Phase												
Minimum Initial (s)	7.0	10.0	7.0	10.0	10.0	7.0	20.0	7.0	20.0	20.0		
Minimum Split (s)	11.0	42.0	11.0	42.0	42.0	11.0	40.0	11.0	40.0	40.0		
Total Split (s)	24.0	47.0	19.0	42.0	42.0	11.0	41.0	13.0	43.0	43.0		
Total Split (%)	20.0%	39.2%	15.8%	35.0%	35.0%	9.2%	34.2%	10.8%	35.8%	35.8%		
Maximum Green (s)	20.0	40.0	15.0	35.0	35.0	7.0	34.0	9.0	36.0	36.0		
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0		
All-Red Time (s)	1.0	3.0	1.0	3.0	3.0	1.0	3.0	1.0	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		
Total Lost Time (s)	4.0	7.0	4.0	7.0	7.0	4.0	7.0	4.0	7.0	7.0		
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead/Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0	3.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0		
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	None	None	None	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	7.0	7.0		
Flash Dont Walk (s)	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0		
Pedestrian Calls (#/hr)	5	5	5	5	5	5	5	5	5	5		
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 17 (14%), Referenced to phase 2: NBT and 6: SBT, Start of Green												
Natural Cycle: 105												
Control Type: Actuated-Coordinated												
Splits and Phases: 4: Dorval Road & Speers Road												
Phase 1: 11 s	Phase 2: 43 s	Phase 3: 24 s	Phase 4: 42 s	Phase 5: 47 s	Phase 6: 27 s	Phase 7: 19 s	Phase 8: 19 s	Phase 9: 08 s	Phase 10: 07 s	Phase 11: 04 s	Phase 12: 08 s	Phase 13: 08 s

Queues
4: Dorval Road & Speers Road

Existing PM
Upper Kerr Village (8/7/24-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group	451	500	212	609	495	71	658	261	647
Lane Group Flow (vph)	0.82	0.44	0.47	0.63	0.88	0.23	0.66	0.84	0.53
v/c Ratio	61.8	32.0	19.1	35.1	35.8	23.5	41.2	56.8	17.3
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	61.8	32.0	19.1	35.1	35.8	23.5	41.2	56.8	17.3
Total Delay	52.4	43.6	18.4	38.6	27.6	10.4	72.8	-38.9	22.0
Queue Length 50th (m)	#72.0	62.0	39.8	67.9	#122.4	19.2	90.5	m#72.9	34.8
Queue Length 95th (m)	412.3			472.1		621.6		494.4	
Internal Link Dist (m)	60.0		85.0		55.0	70.0		110.0	
Turn Bay Length (m)	578	1202	480	1043	593	306	1053	312	1238
Base Capacity (vph)	0	0	0	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.42	0.44	0.58	0.83	0.23	0.62	0.84	0.52
Intersection Summary									
~	Volume exceeds capacity, queue is theoretically infinite.								
#	95th percentile volume exceeds capacity, queue may be longer.								
m	Volume for 95th percentile queue is metered by upstream signal.								

HCM Signalized Intersection Capacity Analysis
4: Dorval Road & Speers Road

Existing PM
Upper Kerr Village (8/7/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	
Traffic Volume (vph)	415	410	50	195	560	455	65	530	75	240	595	375	
Future Volume (vph)	415	410	50	195	560	455	65	530	75	240	595	375	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	7.0	4.0	7.0	4.0	7.0	7.0	4.0	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98	1.00	1.00	0.85	1.00	0.98	1.00	0.95	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95	
Satd. Flow (prot)	3433	3492	1785	3546	1572	1805	3507	1787	3574	1599	1787	3574	
Flt Permitted	0.95	1.00	1.00	0.46	1.00	1.00	0.34	1.00	0.22	1.00	1.00	0.95	
Satd. Flow (perm)	3433	3492	863	3546	1572	648	3507	408	3574	1599	408	3574	
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)	451	446	54	212	609	495	71	576	82	261	647	408	
RTOR Reduction (vph)	0	0	0	0	134	0	9	0	0	0	0	271	
Lane Group Flow (vph)	451	492	0	212	609	361	71	649	0	261	647	137	
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5	
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	1%	1%	1%	1%	1%	
Bus Blockages (#/hr)	0	2	0	0	4	0	0	0	0	0	0	0	
Turn Type	Prot	NA	NA	pm-pt	NA	Perm	pm-pt	NA	pm-pt	NA	Perm	NA	
Protected Phases	7	4		3	8	8	5	2	1	6		6	
Permitted Phases													
Actuated Green, G (s)	19.2	39.1	45.9	32.9	32.9	39.7	34.0	39.7	34.0	49.9	40.2	40.2	
Effective Green, g (s)	19.2	39.1	45.9	32.9	32.9	39.7	34.0	39.7	34.0	49.9	40.2	40.2	
Actuated g/C Ratio	0.16	0.33	0.38	0.27	0.27	0.33	0.28	0.33	0.28	0.42	0.34	0.34	
Clearance Time (s)	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0	
Vehicle Extension (s)	3.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0	
Lane Grp Cap (vph)	549	1137	429	972	430	269	993	306	1197	535	306	1197	
v/s Ratio Prot	c0.13	0.14	0.05	0.17	0.01	0.01	0.18	c0.08	0.18	c0.27	0.09	0.09	
v/s Ratio Perm	0.14			c0.23	0.07								
v/c Ratio	0.82	0.43	0.49	0.63	0.84	0.26	0.65	0.85	0.54	0.26	0.85	0.54	
Uniform Delay, d1	48.7	31.7	26.0	38.2	41.1	28.1	37.8	26.0	32.4	29.0	26.0	32.4	
Progression Factor	1.00	1.00	0.90	0.85	0.73	1.00	1.00	0.85	0.73	1.00	0.85	0.73	
Incremental Delay, d2	9.6	0.6	0.9	1.7	14.2	0.5	3.3	15.3	1.3	0.8	15.3	1.3	
Delay (s)	58.3	32.3	24.1	34.1	44.1	28.6	41.2	53.8	16.7	5.9	53.8	16.7	
Level of Service	E	C	C	C	C	D	C	D	D	D	D	B	
Approach Delay (s)	E	C	C	C	C	D	C	D	D	D	D	B	
Approach LOS	D	D	D	D	D	D	D	D	D	D	D	C	
Intersection Summary													
HCM 2000 Control Delay	34.0											HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87												
Actuated Cycle Length (s)	120.0											Sum of lost time (s)	22.0
Intersection Capacity Utilization	78.1%											ICU Level of Service	D
Analysis Period (min)	15												
c. Critical Lane Group													

HCM Unsignalized Intersection Capacity Analysis
 5. St. Augustine Drive & Speers Road

Existing PM
 Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	10	690	25	0	970	10	0	0	25	5	0	10
Future Volume (Veh/h)	10	690	25	0	970	10	0	0	25	5	0	10
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%	0%	0%	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	719	26	0	1010	10	0	0	26	5	0	10
Pedestrians							5					5
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												
Median storage (veh)												
Upstream signal (m)												
pX platoon unblocked	0.86						0.86	0.86	0.86	0.86	0.86	0.86
VC, conflicting volume	1025			750			1272	1782	378	1426	1790	515
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	697			750			985	1580	378	1164	1589	102
IC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
IC, 2 stage (s)												
p0 queue free %	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free (s)	99			100			100	100	96	96	100	99
CM capacity (veh/h)	776			864			170	92	623	122	91	802
Direction_Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1					
Volume Total	10	479	266	673	347	26	15					
Volume Left	10	0	0	0	0	0	5					
Volume Right	0	0	26	0	10	26	10					
cSH	776	1700	1700	1700	1700	623	281					
Volume to Capacity	0.01	0.28	0.16	0.40	0.20	0.04	0.05					
Queue Length 95th (m)	0.3	0.0	0.0	0.0	0.0	1.0	1.3					
Control Delay (s)	9.7	0.0	0.0	0.0	0.0	11.0	18.5					
Lane LOS	A	A	A	B	B	C	C					
Approach Delay (s)	0.1			0.0		11.0	18.5					
Approach LOS				B		C	C					
Intersection Summary												
Average Delay	0.4											
Intersection Capacity Utilization	37.1%											
Analysis Period (min)	15											
ICU Level of Service	A											

Timings
 6. Speers Road/Cornwall Road & Cross Avenue

Existing PM
 Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBT	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	225	665	1185	10	385	10
Future Volume (vph)	225	665	1185	10	385	10
Turn Type	pm+pt	NA	NA	Prot	Perm	Perm
Protected Phases	5	2	6	4		
Permitted Phases	2	2	6	4	4	4
Detector Phase	5	2	6	4	4	4
Switch Phase						
Minimum Initial (s)	6.0	38.0	38.0	10.0	10.0	10.0
Minimum Split (s)	12.0	47.6	47.6	15.8	15.8	15.8
Total Split (s)	17.0	102.0	85.0	38.0	38.0	38.0
Total Split (%)	12.1%	72.9%	60.7%	27.1%	27.1%	27.1%
Maximum Green (s)	11.0	95.4	78.4	32.2	32.2	32.2
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3	3.3
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8	5.8
Lead/Lag	Lead	Lag	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.5	5.0	5.0	3.0	3.0	3.0
Minimum Gap (s)	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
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Min	C-Min	None	None	None
Walk Time (s)	10.0	10.0	10.0			
Flash Dont Walk (s)	31.0	31.0	31.0			
Pedestrian Calls (#/hr)	5	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: 6: Speers Road/Cornwall Road & Cross Avenue						

Queues Existing PM
6: Speers Road/Cornwall Road & Cross Avenue Upper Kerr Village (8/24-01)

	EBL	EBT	WBT	SBL	SBR
Lane Group	234	693	1250	10	401
Lane Group Flow (vph)	0.61	0.23	0.51	0.06	0.76
v/c Ratio	11.0	3.0	12.2	57.6	23.1
Control Delay	0.0	0.0	0.0	0.0	0.0
Queue Delay	11.0	3.0	12.2	57.6	23.1
Total Delay	9.1	15.6	71.8	2.7	12.1
Queue Length 50th (m)	25.1	28.3	125.3	8.0	29.6
Queue Length 95th (m)	474.4	77.5	60.0		
Internal Link Dist (m)	80.0			45.0	
Turn Bay Length (m)	387	2978	2454	415	876
Base Capacity (vph)	0	0	0	0	0
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	0.60	0.23	0.51	0.02	0.46
Intersection Summary					

HCM Signalized Intersection Capacity Analysis Existing PM
6: Speers Road/Cornwall Road & Cross Avenue Upper Kerr Village (8/24-01)

	EBL	EBT	WBT	SBL	SBR
Movement	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔
Traffic Volume (vph)	225	665	1185	15	10
Future Volume (vph)	225	665	1185	15	10
Ideal Flow (vphpb)	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
Frb. ped/bikes	1.00	1.00	1.00	1.00	1.00
Frb. 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	0.17	1.00	1.00	0.95	1.00
Satd. Flow (perm)	304	3610	3567	1805	2733
Peak-Hour factor, PHF	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	234	693	1234	16	10
RTOR Reduction (vph)	0	0	0	0	294
Lane Group Flow (vph)	234	693	1250	0	107
Confl. Peds. (#/hr)	5			5	
Heavy Vehicles (%)	6%	0%	1%	0%	4%
Turn Type	pm>pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2			4	
Actuated Green, G (s)	115.5	115.5	96.4	12.1	12.1
Effective Green, g (s)	115.5	115.5	96.4	12.1	12.1
Actuated g/C Ratio	0.82	0.82	0.69	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)	381	2978	2456	156	236
v/s Ratio Prot	c0.06	0.19	0.35	0.01	
v/c Ratio Perm	c0.45				c0.04
v/c Ratio	0.61	0.23	0.51	0.06	0.45
Uniform Delay, d1	7.7	2.7	10.5	58.7	60.8
Progression Factor	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.1	0.2	0.8	0.2	1.4
Delay (s)	10.7	2.8	11.2	58.9	62.2
Level of Service	B	A	B	E	E
Approach Delay (s)	4.8	11.2	62.1		
Approach LOS	A	B	E		
Intersection Summary					
HCM 2000 Control Delay			17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.61		
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					

7: Kerr Street & Prince Charles Drive

8: Kerr Street & Elmwood Road

Existing PM Upper Kerr Village (8/24-01)

Existing PM Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	10	0	10	10	0	30	5	475	10	20	605	25
Traffic Volume (veh/h)	10	0	10	10	0	30	5	475	10	20	605	25
Future Volume (Veh/h)	10	0	10	10	0	30	5	475	10	20	605	25
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	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	500	11	21	637	26
Pedestrians	20			30								5
Lane Width (m)	3.6			3.6								3.6
Walking Speed (m/s)	1.1			1.1								1.1
Percent Blockage	2			3								0
Right turn flare (veh)							None	None	None	None	None	None
Median type							None	None	None	None	None	None
Median storage (veh)												127
Upstream signal (m)								238				
pX platoon unblocked	0.78	0.78	0.76	0.78	0.78	0.96	0.76	0.76		0.96		
VC conflicting volume	1264	1263	670	1248	1270	540	683			541		
VC1 stage 1 conf vol												
VC2 stage 2 conf vol												
VCU unblocked vol	1085	1083	405	1064	1092	502	422			502		
IC single (s)	7.1	7.0	6.2	7.1	6.5	6.2	4.3			4.1		
IC 2 stage (s)												
p0 queue free %	3.5	4.5	3.3	3.5	4.0	3.3	2.4			2.2		
IF (s)	92	100	98	92	100	94	99			98		
CM capacity (veh/h)	132	129	484	141	156	534	779			979		
Direction_Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	22	43	516	684								
Volume Left	11	11	5	21								
Volume Right	11	32	11	26								
cSH	208	312	779	979								
Volume to Capacity	0.11	0.14	0.01	0.02								
Queue Length 95th (m)	2.7	3.6	0.1	0.5								
Control Delay (s)	24.4	18.4	0.2	0.6								
Lane LOS	C	C	A	A								
Approach Delay (s)	24.4	18.4	0.2	0.6								
Approach LOS	C	C	A	A								
Intersection Summary												
Average Delay	1.4											
Intersection Capacity Utilization	57.5%											
ICU Level of Service	B											
Analysis Period (min)	15											

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W					
Traffic Volume (veh/h)	15	10	5	470	565	40
Future Volume (Veh/h)	15	10	5	470	565	40
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	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	495	595	42
Pedestrians	36					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	3					
Right turn flare (veh)				None	None	None
Median type				None	None	None
Median storage (veh)						
Upstream signal (m)				103	262	
pX platoon unblocked	0.87	0.83	0.83			
VC conflicting volume	1156	651	672			
VC1 stage 1 conf vol						
VC2 stage 2 conf vol						
VCU unblocked vol	895	472	497			
IC single (s)	6.4	6.3	4.3			
IC 2 stage (s)						
p0 queue free %	94	98	99			
IF (s)	3.5	3.4	2.4			
CM capacity (veh/h)	261	461	783			
Direction_Lane #	EB 1	NB 1	SB 1			
Volume Total	27	500	637			
Volume Left	16	5	0			
Volume Right	11	0	42			
cSH	317	783	1700			
Volume to Capacity	0.09	0.01	0.37			
Queue Length 95th (m)	2.1	0.1	0.0			
Control Delay (s)	17.4	0.2	0.0			
Lane LOS	C	A	A			
Approach Delay (s)	17.4	0.2	0.0			
Approach LOS	C	A	A			
Intersection Summary						
Average Delay	0.5					
Intersection Capacity Utilization	42.4%					
ICU Level of Service	A					
Analysis Period (min)	15					

Timings 9: Kerr Street & Stewart Street

Queues 9: Kerr Street & Stewart Street

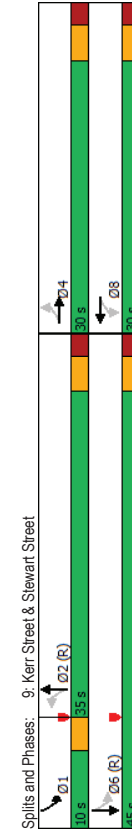
Existing PM
Upper Kerr Village (8/24-01)

Existing PM
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	50	10	10	15	10	350	55	455
Traffic Volume (vph)	50	10	10	15	10	350	55	455
Future Volume (vph)	Perm	NA	Perm	NA	Perm	NA	prn+pt	NA
Turn Type	4	8	8	2	2	1	6	6
Permitted Phases	4	8	8	2	2	1	6	6
Detector Phase	4	8	8	2	2	1	6	6
Switch Phase	10.0	10.0	10.0	10.0	24.0	24.0	6.0	24.0
Minimum Initial (s)	30.0	30.0	30.0	30.0	32.0	32.0	10.0	32.0
Minimum Split (s)	30.0	30.0	30.0	30.0	35.0	35.0	10.0	45.0
Total Split (s)	40.0%	40.0%	40.0%	40.0%	46.7%	46.7%	13.3%	60.0%
Total Split (%)	24.6	24.6	24.6	24.6	29.6	29.6	7.0	39.6
Maximum Green (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.0	3.3
Yellow Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	2.1
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Total Lost Time (s)	Lead/Lag	Lag	Lag	Lead	Lead	Lead	Yes	Yes
Lead/Lag	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead-Lag Optimize?	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Recall Mode	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Walk Time (s)	13.0	13.0	13.0	13.0	14.0	14.0	14.0	14.0
Flash Dont Walk (s)	20	20	20	20	35	35	35	35
Pedestrian Calls (#/hr)	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								

	EBT	WBT	NBT	SBT
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	81	109	407	609
v/c Ratio	0.29	0.29	0.31	0.51
Control Delay	21.6	10.0	7.6	10.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.6	10.0	7.6	10.1
Queue Length 50th (m)	8.5	3.4	16.3	29.2
Queue Length 95th (m)	16.5	13.0	48.7	88.7
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)	444	552	1295	1192
Base Capacity (vph)	0	0	0	0
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	0.18	0.20	0.31	0.51
Intersection Summary				

Splits and Phases: 9: Kerr Street & Stewart Street



9: Kerr Street & Stewart Street

Existing PM
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4	4	4	4	4	4	4	4	4	4	4
Traffic Volume (vph)	50	10	15	10	15	75	10	350	15	55	455	50
Future Volume (vph)	50	10	15	10	15	75	10	350	15	55	455	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4											
Lane Util. Factor	1.00											
Fpb. ped/bikes	0.96											
Fpb. ped/bikes	1.00											
Ft	0.99											
Ft/Protected	0.99											
Satd. Flow (prot)	1661											
Ft/Permitted	0.77											
Satd. Flow (perm)	1323											
Peak-hour factor, PHF	0.92											
Adj. Flow (vph)	54											
RTOR Reduction (vph)	0											
Lane Group Flow (vph)	68											
Confl. Peds. (#/hr)	20											
Heavy Vehicles (%)	2%											
Bus Blockages (#/hr)	0											
Turn Type	Perm	NA	NA	Perm	NA	NA	Perm	NA	NA	pm-pt	NA	NA
Protected Phases	4											
Permitted Phases	4											
Actuated Green, G (s)	13.2											
Effective Green, g (s)	13.2											
Actuated G/C Ratio	0.18											
Clearance Time (s)	4.0											
Vehicle Extension (s)	4.0											
Lane Grp Cap. (vph)	232											
v/s Ratio Prot	c0.05											
v/s Ratio Perm	0.29											
v/c Ratio	26.8											
Uniform Delay, d1	1.0											
Progression Factor	1.0											
Incremental Delay, d2	27.8											
Level of Service	C											
Approach Delay (s)	27.8											
Approach LOS	C											
Intersection Summary	9.4											
HCM 2000 Control Delay	0.51											
HCM 2000 Volume to Capacity ratio	75.0											
Actuated Cycle Length (s)	13.8											
Intersection Capacity Utilization	77.5%											
Analysis Period (min)	15											
c Critical Lane Group	A											

10: Donval Road & Wyecroft Road

Existing PM
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations		4	4	4	4	4	4	4	4
Traffic Volume (vph)	385	215	60	90	470	95	1160	105	985
Future Volume (vph)	385	215	60	90	470	95	1160	105	985
Turn Type	Prot	NA	pm-pt	NA	Perm	pm-pt	NA	Prot	NA
Protected Phases	7								
Permitted Phases	7								
Detector Phase	7								
Switch Phase	7								
Minimum Initial (s)	7.0								
Minimum Split (s)	12.0								
Total Split (s)	21.0								
Total Split (%)	17.5%								
Maximum Green (s)	16.0								
Yellow Time (s)	3.0								
All-Red Time (s)	2.0								
Lost Time Adjust (s)	0.0								
Total Lost Time (s)	5.0								
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0								
Minimum Gap (s)	3.0								
Time Before Reduce (s)	0.0								
Time To Reduce (s)	0.0								
Recall Mode	None								
Walk Time (s)	7.0								
Flash Dont Walk (s)	11.0								
Pedestrian Calls (#/hr)	0								
Intersection Summary	0								
Cycle Length: 120	120								
Actuated Cycle Length: 120	120								
Offset: 103 (86%), Referenced to phase 2:NETL and 6:SBT, Start of Green	103								
Natural Cycle: 90	90								
Control Type: Actuated-Coordinated	Actuated-Coordinated								



Queues 10: Dorval Road & Wynecroft Road Existing PM Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	418	435	65	98	511	103	1304	114
Lane Group Flow (vph)	0.92	0.36	0.18	0.23	0.94	0.51	0.77	0.42
v/c Ratio	77.2	18.1	20.1	36.4	51.3	25.7	33.2	57.1
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	77.2	18.1	20.1	36.4	51.3	25.7	33.2	57.1
Total Delay	51.2	22.4	8.3	17.8	71.4	12.8	104.8	13.4
Queue Length 50th (m)	#82.7	36.9	16.3	31.8	#132.8	m19.6	127.5	22.2
Queue Length 95th (m)	155.6	199.3					494.4	672.1
Internal Link Dist (m)	115.0	145.0			65.0		125.0	
Turn Bay Length (m)	456	1206	481	474	588	239	1697	350
Base Capacity (vph)	0	0	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.36	0.14	0.21	0.87	0.43	0.77	0.33

Intersection Summary
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis 10: Dorval Road & Wynecroft Road Existing PM Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	TT	TT	TT	T	T	T	T	T	T	T	T	T
Traffic Volume (vph)	385	215	185	60	90	470	95	1160	40	105	985	210
Future Volume (vph)	385	215	185	60	90	470	95	1160	40	105	985	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	5.0	7.0	7.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00	1.00	0.91	1.00	0.97	0.91	0.91
Fpb. ped/bikes	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.93	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	0.97	0.97
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	3213	3217	1783	1727	1577	1736	5038	3502	4947	3502	4947	3502
Flt Permitted	0.95	1.00	0.50	1.00	1.00	0.10	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3213	3217	937	1727	1577	185	5038	3502	4947	3502	4947	3502
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)	418	234	201	65	98	511	103	1261	43	114	1071	228
RTOR Reduction (vph)	0	120	0	0	0	159	0	3	0	0	26	0
Lane Group Flow (vph)	418	315	0	65	98	352	103	1301	0	114	1273	0
Confl. Peds. (#/hr)	1	4	4	4	4	1	1	1	1	1	1	1
Heavy Vehicles (%)	9%	4%	2%	1%	10%	1%	4%	2%	2%	0%	1%	5%
Bus Blockages (#/hr)	0	2	0	0	0	0	0	3	0	0	0	0
Turn Type	Prot	NA	NA	pm-pt	NA	Perm	pm-pt	NA	Prot	NA	Prot	NA
Protected Phases	7	4	3	8	8	5	2	1	6	6	6	6
Permitted Phases	17.0	40.5	37.1	30.3	30.3	48.9	39.4	9.3	39.2	9.3	39.2	39.2
Actuated Green, G (s)	17.0	40.5	37.1	30.3	30.3	48.9	39.4	9.3	39.2	9.3	39.2	39.2
Effective Green, g (s)	0.14	0.34	0.31	0.25	0.25	0.41	0.33	0.08	0.33	0.08	0.33	0.33
Actuated G/C Ratio	5.0	7.0	5.0	7.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	7.0
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	455	1085	337	436	398	198	1654	271	1616	271	1616	1616
Lane Grp Cap (vph)	c0.13	0.10	0.01	0.06	c0.04	c0.26	0.03	0.26	0.03	0.26	0.03	0.26
v/s Ratio Prot	0.05											
v/s Ratio Perm	0.92	0.29	0.19	0.22	0.88	0.52	0.79	0.42	0.79	0.42	0.79	0.79
Uniform Delay, d1	50.8	29.2	29.7	35.5	43.2	25.1	36.5	52.8	36.6	52.8	36.6	36.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.84	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	23.4	0.1	0.3	0.3	20.1	1.6	2.6	1.1	4.0	1.1	4.0	4.0
Delay (s)	74.2	29.3	30.0	35.8	63.2	26.6	33.2	53.8	40.6	53.8	40.6	40.6
Level of Service	E	C	C	D	E	C	C	D	D	D	D	D
Approach Delay (s)	51.3			56.1			32.7		41.7			41.7
Approach LOS	D			E			C		D			D

Intersection Summary	
HCM 2000 Control Delay	42.9
HCM 2000 Volume to Capacity ratio	0.82
Actuated Cycle Length (s)	120.0
Intersection Capacity Utilization	84.4%
Analysis Period (min)	15
c Critical Lane Group	

Queues
2: Kerr Street & Shepherd Road

Future Background AM
Upper Kerr Village (8/24-01)

	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group						
Lane Group Flow (vph)	132	236	308	71	99	478
v/c Ratio	0.41	0.34	0.21	0.10	0.14	0.23
Control Delay	22.0	1.3	10.1	2.6	4.0	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.0	1.3	10.1	2.6	4.0	4.5
Queue Length 50th (m)	9.7	0.0	8.5	0.0	2.4	7.3
Queue Length 95th (m)	23.9	0.0	16.4	4.3	6.9	14.4
Internal Link Dist (m)	241.3	143.2				21.4
Turn Bay Length (m)				50.0	50.0	
Base Capacity (vph)	602	1545	2811	1215	778	3462
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 v/c Ratio	0.22	0.15	0.11	0.06	0.13	0.14
Intersection Summary						

HCM Signalized Intersection Capacity Analysis
2: Kerr Street & Shepherd Road

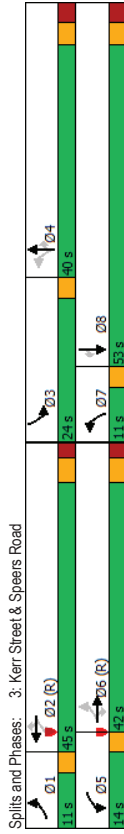
Future Background AM
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	120	0	215	0	280	65	90	435	0
Future Volume (vph)	0	0	0	120	0	215	0	280	65	90	435	0
Ideal Flow (vphpb)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0				5.2	5.2	4.0	5.2
Lane Util. Factor				1.00	1.00				0.95	1.00	1.00	0.95
Fpb. ped/bikes				1.00	0.98				1.00	0.97	1.00	1.00
Ft				1.00	1.00				1.00	1.00	1.00	1.00
Flt Protected				1.00	0.85				1.00	0.85	1.00	1.00
Satd. Flow (prot)				1667	1589				3497	1499	1785	3505
Flt Permitted				0.73	1.00				1.00	1.00	0.47	1.00
Satd. Flow (perm)				1276	1589				3497	1499	879	3505
Peak-Hour factor, PHF	0.92	0.92	0.92	0.91	0.92	0.91	0.92	0.91	0.91	0.91	0.91	0.92
Adj. Flow (vph)	0	0	0	132	0	236	0	308	71	99	478	0
RTOR Reduction (vph)	0	0	0	0	0	177	0	0	0	44	0	0
Lane Group Flow (vph)	0	0	0	132	59	0	0	308	27	99	478	0
Confl. Peds. (#/hr)				5	5				5	5		5
Heavy Vehicles (%)	2%	2%	2%	8%	2%	0%	2%	2%	5%	1%	3%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	6	0	0	0	0
Turn Type	Perm	Perm	pm-pt	NA	NA	Perm	NA	NA	Perm	pm-pt	NA	Perm
Protected Phases		4		3	8		2			1		6
Permitted Phases	4			8		2			2	6		6
Actuated Green, G (s)	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	19.4	19.4	28.7	28.7
Effective Green, g (s)	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	19.4	19.4	28.7	28.7
Actuated G/C Ratio	0.25	0.25	0.25	0.38	0.38	0.38	0.38	0.38	0.57	0.57	0.57	0.57
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	5.2	5.2	4.0	5.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.5	3.5	2.5	3.5
Lane Grp Cap (vph)	373	396					1343	575	594	1991		
v/s Ratio Prot	c0.05	0.04					0.09		0.02	c0.14		
v/s Ratio Perm	c0.04								0.02	0.08		
v/c Ratio	0.35	0.15	0.15	0.23	0.05	0.17	0.24		0.05	0.17	0.24	
Uniform Delay, d1	15.5	14.8		10.5	9.8	5.2	5.4		9.8	5.2	5.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.6	0.2		0.1	0.0	0.1	0.1		0.1	0.1	0.1	
Delay (s)	16.0	14.9		10.6	9.8	5.3	5.5		9.8	5.3	5.5	
Level of Service	B	B		B	B	A	A		A	A	A	
Approach Delay (s)	0.0			15.3			10.5		5.5			
Approach LOS	A			B			B		A			
Intersection Summary												
HCM 2000 Control Delay			9.6				HCM 2000 Level of Service				A	
HCM 2000 Volume to Capacity ratio			0.34									
Actuated Cycle Length (s)			50.5				Sum of lost time (s)				17.2	
Intersection Capacity Utilization			56.0%				ICU Level of Service				B	
Analysis Period (min)			15									
c. Critical Lane Group												

Timings 3: Kerr Street & Speers Road Future Background AM Upper Kerr Village (8/24-01)

EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
4	4	4	4	4	4	4	4	4	4	4	4
40	710	85	195	540	190	100	125	370	350	160	90
40	710	85	195	540	190	100	125	370	350	160	90
pm-pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
1	6	6	2	2	2	4	4	4	4	3	8
1	6	6	5	2	2	7	4	4	4	3	8
Minimum Initial (s)	7.0	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	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	11.0	40.0	40.0	24.0	53.0	53.0
Total Split (%)	9.2%	35.0%	35.0%	11.7%	37.5%	9.2%	33.3%	33.3%	20.0%	44.2%	44.2%
Maximum Green (s)	6.0	36.1	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	3.7	3.0	3.7	3.7	3.0	3.3	3.0	3.0	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
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
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
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.5	5.5	5.5	2.5	5.5	2.5	4.0	4.0	2.5	4.0	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	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	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	0.0
Recall Mode	None	C-Min	None	C-Min	None	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	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	14.0
Pedestrian Calls (#/hr)	15	15	15	15	15	15	35	35	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



Queues 3: Kerr Street & Speers Road Future Background AM Upper Kerr Village (8/24-01)

EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
47	826	99	227	628	221	116	145	430	407	186	105
0.13	0.72	0.18	0.75	0.45	0.30	0.28	0.33	0.91	0.79	0.30	0.18
15.2	31.5	4.4	38.5	29.6	4.9	20.6	38.1	50.3	60.3	29.7	5.2
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15.2	31.5	4.4	38.5	29.6	4.9	20.6	38.1	50.3	60.3	29.7	5.2
3.6	98.7	1.5	32.3	60.7	0.0	14.7	27.0	61.3	47.7	30.6	0.0
9.7	119.0	5.6	#63.5	77.6	14.1	23.0	41.9	#98.3	60.5	44.2	9.5
145.3			474.4			103.4					143.2
105.0	75.0	75.0	100.0	50.0	100.0	50.0	517	522	583	718	652
384	1154	564	301	1399	739	416	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0.12	0.72	0.18	0.75	0.45	0.30	0.28	0.28	0.82	0.70	0.26	0.16

Intersection Summary
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

3: Kerr Street & Speers Road
 HCM Signalized Intersection Capacity Analysis
 Future Background AM
 Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	7	10	8	19	19	10	12	37	35	16	9
Traffic Volume (vph)	40	710	85	195	540	190	100	125	370	350	160	90
Future Volume (vph)	40	710	85	195	540	190	100	125	370	350	160	90
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	0.93	1.00	1.00	0.95
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1799	3378	1437	1687	3438	1495	1675	1844	1429	3335	1845	1511
Flt Permitted	0.38	1.00	1.00	0.17	1.00	1.00	0.64	1.00	1.00	0.85	1.00	1.00
Satd. Flow (perm)	727	3378	1437	298	3438	1495	1129	1844	1429	3335	1845	1511
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	47	826	99	227	628	221	116	145	430	407	186	105
RTOR Reduction (vph)	0	0	65	0	0	132	0	0	127	0	0	70
Lane Group Flow (vph)	47	826	34	227	628	89	116	145	303	407	186	35
Confl. Peds. (#/hr)	15	10	10	10	10	15	20	15	35	35	20	20
Heavy Vehicles (%)	0%	6%	7%	7%	5%	4%	6%	1%	5%	5%	3%	2%
Bus Blockages (#/hr)	0	4	0	0	0	0	0	5	0	0	0	0
Turn Type	pm-pt	NA	Perm	pm-pt	NA	Perm	pm-pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	6	5	2	2	7	4			3	8	
Permitted Phases	6	6	2	2	4							8
Actuated Green, G (s)	48.8	40.9	40.9	57.1	48.2	48.2	37.0	29.1	29.1	18.6	39.8	39.8
Effective Green, g (s)	46.8	40.9	40.9	57.1	48.2	48.2	37.0	29.1	29.1	18.6	39.8	39.8
Actuated G/C Ratio	0.39	0.34	0.34	0.48	0.40	0.40	0.31	0.24	0.24	0.16	0.33	0.33
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	1151	489	294	1380	600	384	447	346	516	611	501
v/s Ratio Prot	0.01	0.24		c0.08	0.18		0.02	0.08		c0.12	0.10	
v/s Ratio Perm	0.05	0.02	0.02	0.28	0.06	0.06	0.07					0.02
v/s Ratio	0.14	0.72	0.07	0.77	0.46	0.15	0.30	0.32	0.87	0.79	0.30	0.07
Uniform Delay, d1	23.0	34.5	26.7	22.4	26.3	22.8	30.8	37.4	43.7	48.8	29.8	27.4
Progression Factor	0.77	0.83	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	3.7	0.3	11.4	1.1	0.5	0.3	0.6	21.5	7.6	0.4	0.1
Delay (s)	17.8	30.2	22.4	33.8	27.4	23.4	31.2	37.9	65.2	56.4	30.2	27.5
Level of Service	B	C	C	C	C	C	C	D	E	E	C	C
Approach Delay (s)	28.8			27.9			53.8			45.1		
Approach LOS	C			C			D			D		
Intersection Summary												
HCM 2000 Control Delay	36.8 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity Ratio	0.82											
Actuated Cycle Length (s)	120.0 Sum of lost time (s)											
Intersection Capacity Utilization	73.1% ICU Level of Service											
Analysis Period (min)	15											
Critical Lane Group	c											

4: Donval Road & Speers Road
 Timings
 Future Background AM
 Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	
Traffic Volume (vph)	415	580	40	75	385	225	70	825	255	515	255	
Future Volume (vph)	415	580	40	75	385	225	70	825	255	515	255	
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm+pt	NA	pm+pt	NA	Perm	
Protected Phases	7	4		3	8	8	1	5	2	1	6	
Permitted Phases	7	4	4	4	3	8	1	5	2	1	6	
Detector Phase												
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	7.0	20.0	20.0	
Minimum Split (s)	11.0	42.0	42.0	11.0	42.0	11.0	11.0	40.0	11.0	40.0	40.0	
Total Split (s)	21.0	50.0	50.0	13.0	42.0	12.0	11.0	45.0	12.0	46.0	46.0	
Total Split (%)	17.5%	41.7%	41.7%	10.8%	35.0%	10.0%	9.2%	37.5%	10.0%	38.3%	38.3%	
Maximum Green (s)	17.0	43.0	43.0	9.0	35.0	8.0	7.0	38.0	8.0	39.0	39.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	3.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	1.0	1.0	3.0	1.0	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	
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0	
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0	
Minimum Gap (s)	3.0	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	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	0.0	
Recall Mode	None	None	None	None	None	None	None	C-Min	None	C-Min	C-Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	
Pedestrian Calls (#/hr)	5	5	5	5	5	5	5	5	5	5	5	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 41 (34%), Referenced to phase 2:NBLT and 6:SBTL, Start of Green												
Natural Cycle: 125												
Control Type: Actuated-Coordinated												
Splits and Phases: 4: Donval Road & Speers Road 												

Queues
4: Dorval Road & Speers Road

HCM Signalized Intersection Capacity Analysis
4: Dorval Road & Speers Road

Future Background AM
Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group	451	630	43	82	418	245	76	1038	277	560	277
Lane Group Flow (vph)	0.94	0.64	0.08	0.31	0.63	0.38	0.19	0.93	0.86	0.37	0.36
v/c Ratio	79.4	40.2	0.3	15.6	33.1	7.7	17.8	54.8	49.3	11.2	3.5
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	79.4	40.2	0.3	15.6	33.1	7.7	17.8	54.8	49.3	11.2	3.5
Total Delay	79.4	40.2	0.3	15.6	33.1	7.7	17.8	54.8	49.3	11.2	3.5
Queue Length 50th (m)	54.8	71.4	0.0	4.7	30.6	10.2	8.3	123.0	23.6	37.8	11.7
Queue Length 95th (m)	#85.1	79.0	0.0	8.3	40.3	26.3	19.6	#163.8	#128.3	47.1	17.9
Internal Link Dist (m)	412.3			472.1			621.6			494.4	
Turn Bay Length (m)	60.0		60.0	85.0		55.0	70.0		110.0		
Base Capacity (vph)	481	1192	600	275	949	639	396	1111	323	1506	762
Stavation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.53	0.07	0.30	0.44	0.38	0.19	0.93	0.86	0.37	0.36
Intersection Summary											
#	95th percentile volume exceeds capacity, queue may be longer.										
	Queue shown is maximum after two cycles.										

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Movement	451	630	43	82	418	245	76	1038	277	560	277
Lane Configurations	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT
Traffic Volume (vph)	415	580	40	75	385	225	70	825	130	285	515
Future Volume (vph)	415	580	40	75	385	225	70	825	130	285	515
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	0.98
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	1.00	1.00	0.85
Flt Flow (prot)	3400	3329	1482	1656	3256	1494	1785	3476	1687	3539	1417
Flt Permitted	0.95	1.00	1.00	0.38	1.00	1.00	0.44	1.00	0.10	1.00	1.00
Satd. Flow (perm)	3400	3329	1482	659	3256	1494	831	3476	172	3539	1417
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
Adj. Flow (vph)	451	630	43	82	418	245	76	897	141	277	560
RTOR Reduction (vph)	0	0	30	0	0	0	69	0	10	0	0
Lane Group Flow (vph)	451	630	13	82	418	176	76	1028	0	277	560
Confl. Peds. (#/hr)	5			5		5		5		5	
Heavy Vehicles (%)	3%	8%	9%	9%	10%	7%	1%	2%	0%	7%	2%
Bus Blockages (#/hr)	0	2	0	0	4	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm-pt	NA	pm-pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6
Permitted Phases			4			8		2			6
Actuated Green, G (s)	17.0	35.3	35.3	32.3	25.3	43.8	43.4	37.2	59.7	49.5	49.5
Effective Green, g (s)	17.0	35.3	35.3	32.3	25.3	43.8	43.4	37.2	59.7	49.5	49.5
Actuated G/C Ratio	0.14	0.29	0.29	0.27	0.21	0.36	0.36	0.31	0.50	0.41	0.41
Clearance Time (s)	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	481	979	435	235	686	545	349	1077	319	1459	584
v/s Ratio Prot	c0.13	c0.19		0.02	0.13	0.05	0.01	c0.30	c0.13	0.16	
v/s Ratio Perm			0.01	0.07	0.07	0.07			0.30		0.08
v/c Ratio	0.94	0.64	0.03	0.35	0.61	0.32	0.22	0.95	0.87	0.38	0.20
Uniform Delay, d1	51.0	36.9	30.1	33.7	42.9	27.4	25.5	40.6	33.9	24.6	22.5
Progression Factor	1.00	1.00	1.00	0.67	0.46	1.00	1.00	0.92	0.92	0.41	0.71
Incremental Delay, d2	26.0	2.0	0.1	0.9	2.2	0.3	0.3	18.4	17.2	0.6	0.6
Delay (s)	76.9	38.9	30.2	20.8	31.1	12.9	25.9	59.0	48.4	10.8	16.7
Level of Service	E	D	C	C	C	B	C	E	D	B	B
Approach Delay (s)		53.8			24.0		56.7		21.6		
Approach LOS		D			C		E		C		C
Intersection Summary											
HCM 2000 Control Delay	40.4										
HCM 2000 Volume to Capacity ratio	0.87										
Actuated Cycle Length (s)	120.0										
Sum of lost time (s)	22.0										
Intersection Capacity Utilization	84.7%										
ICU Level of Service	E										
Analysis Period (min)	15										
Critical Lane Group	c										

Timings 5. St. Augustine Drive & Speers Road

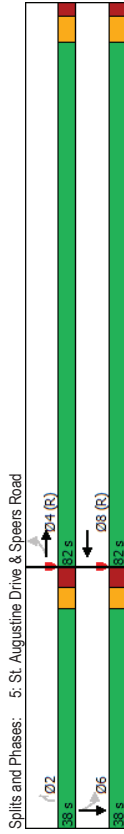
Queues 5. St. Augustine Drive & Speers Road

Future Background AM
Upper Kerr Village (8/24-01)

Future Background AM
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	WBT	NBR	NBR	Ø6
Lane Configurations	5	4	4	4	4	Ø6
Traffic Volume (vph)	850	720	20	20	20	
Future Volume (vph)	850	720	20	20	20	
Turn Type	Perm	NA	NA	Perm	Perm	6
Protected Phases		4	8			
Permitted Phases	4			2		
Detector Phase	4	4	8	2		
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	23.9	23.9	23.9	24.3	24.3	
Total Split (s)	82.0	82.0	82.0	38.0	38.0	
Total Split (%)	68.3%	68.3%	68.3%	31.7%	32%	
Maximum Green (s)	76.1	76.1	76.1	31.7	31.7	
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3	
All-Red Time (s)	2.2	2.2	2.2	3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9	5.9	5.9	6.3	6.3	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	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	C-Min	C-Min	C-Min	None	None	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 51 (43%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated



Lane Group	EBL	EBT	WBT	NBR	NBR
Lane Group Flow (vph)	6	983	835	23	23
v/c Ratio	0.01	0.31	0.27	0.11	0.11
Control Delay	1.6	1.4	4.7	1.1	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	1.6	1.4	4.7	1.1	1.1
Queue Length 50th (m)	0.1	13.6	45.6	0.0	0.0
Queue Length 95th (m)	m0.3	m20.4	52.3	0.0	0.0
Internal Link Dist (m)		472.1	42.5		
Turn Bay Length (m)	50.0				
Base Capacity (vph)	583	3124	3122	519	519
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	0.01	0.31	0.27	0.04	0.04

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

5. St. Augustine Drive & Speers Road

6. Speers Road/Cornwall Road & Cross Avenue

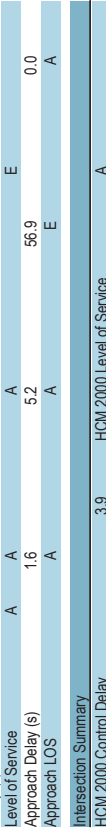
Future Background AM
Upper Kerr Village (8/24-01)

Future Background AM
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	850	15	0	720	15	0	0	20	0	20	0
Traffic Volume (vph)	5	850	15	0	720	15	0	0	20	0	20	0
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
Total Lost time (s)	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00	1.00	0.95
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
Frbp. ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.86	1.00	1.00	0.86
Frt	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1796	3430	3425	3425	3425	3425	3425	3425	1565	3425	3425	1565
Flt Permitted	0.34	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	638	3430	3425	3425	3425	3425	3425	3425	1565	3425	3425	1565
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	6	966	17	0	818	17	0	0	23	0	23	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	22	0	22	0
Lane Group Flow (vph)	6	983	0	0	835	0	0	0	1	0	1	0
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	0%	5%	0%	0%	5%	5%	0%	0%	5%	0%	0%	5%
Turn Type	Perm	NA	NA	NA	NA	NA	NA	NA	Perm	Perm	Perm	NA
Protected Phases	4			8					2	6		6
Permitted Phases	4			104.5					3.3	3.3		3.3
Actuated Green, G (s)	104.5	104.5	104.5	104.5	104.5	104.5	104.5	104.5	3.3	3.3	104.5	3.3
Effective Green, g (s)	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.03	0.03	0.87	0.03
Actuated G/C Ratio	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	6.3	6.3	3.0	6.3
Clearance Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	3.0	3.0	5.9	3.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	555	2986	2982	2982	2982	2982	2982	2982	43	43	2982	43
v/s Ratio Prot	0.01	0.01	0.01	0.24	0.24	0.24	0.24	0.24	c0.00	c0.00	0.24	c0.00
v/c Ratio	0.01	0.33	0.28	0.28	0.28	0.28	0.28	0.28	0.01	0.01	0.28	0.01
Uniform Delay, d1	1.0	1.4	1.3	1.3	1.3	1.3	1.3	1.3	56.8	56.8	1.3	56.8
Progression Factor	1.19	0.96	0.96	0.96	0.96	0.96	0.96	0.96	1.00	1.00	0.96	1.00
Incremental Delay, d2	1.2	1.6	1.6	1.6	1.6	1.6	1.6	1.6	56.9	56.9	1.6	56.9
Level of Service	A	A	A	A	A	A	A	A	E	E	A	E
Approach Delay (s)	1.6	5.2	5.2	5.2	5.2	5.2	5.2	5.2	56.9	56.9	5.2	56.9
Approach LOS	A	A	A	A	A	A	A	A	E	E	A	A
Intersection Summary												
HCM 2000 Control Delay	3.9 HCM 2000 Level of Service A											
HCM 2000 Volume to Capacity ratio	0.32											
Actuated Cycle Length (s)	120.0 Sum of lost time (s) 12.2											
Intersection Capacity Utilization	38.3% ICU Level of Service A											
Analysis Period (min)	15											
c Critical Lane Group												

Future Background AM
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	1220	610	5	245	5	2	6	4	4	4	4
Traffic Volume (vph)	205	1220	610	5	245	5	2	6	4	4	4	4
Future Volume (vph)	205	1220	610	5	245	5	2	6	4	4	4	4
Turn Type	pm-pt	NA	NA	NA	Prot	Perm						
Protected Phases	5	2	6	4								
Permitted Phases	5	2	6	4								
Detector Phase	5	2	6	4								
Switch Phase	6.0	38.0	38.0	10.0	10.0	10.0						
Minimum Initial (s)	12.0	47.6	47.6	15.8	15.8	15.8						
Minimum Split (s)	35.0	109.0	74.0	31.0	31.0	31.0						
Total Split (%)	25.0%	77.9%	57.9%	22.1%	22.1%	22.1%						
Maximum Green (s)	29.0	102.4	67.4	25.2	25.2	25.2						
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3	3.3						
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5	2.5						
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0						
Total Lost Time (s)	6.0	6.6	6.6	5.8	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	3.0						
Minimum Gap (s)	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						
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0						
Recall Mode	None	C-Min	C-Min	None	None	None						
Walk Time (s)	10.0	10.0	10.0									
Flash Dont Walk (s)	31.0	31.0	31.0									
Pedestrian Calls (#/hr)	5	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												



Queues
6: Speers Road/Cornwall Road & Cross Avenue

Future Background AM
Upper Kerr Village (8/24-01)

	EBL	EBT	WBT	SBL	SBR
Lane Group	241	1435	742	6	288
Lane Group Flow (vph)	0.42	0.49	0.30	0.05	0.63
v/c Ratio	4.4	3.9	7.3	60.6	12.9
Control Delay	0.0	0.0	0.0	0.0	0.0
Queue Delay	4.4	3.9	7.3	60.6	12.9
Total Delay	9.4	44.7	33.4	1.6	0.0
Queue Length 50th (m)	14.5	53.4	43.6	5.7	11.7
Queue Length 95th (m)	474.4	77.5	60.0		
Internal Link Dist (m)	80.0		45.0		
Turn Bay Length (m)	725	2905	2501	324	705
Base Capacity (vph)	0	0	0	0	0
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	0.33	0.49	0.30	0.02	0.41
Intersection Summary					

HCM Signalized Intersection Capacity Analysis
6: Speers Road/Cornwall Road & Cross Avenue

Future Background AM
Upper Kerr Village (8/24-01)

	EBL	EBT	WBT	SBL	SBR
Movement	EBL	EBT	WBT	SBL	SBR
Lane Configurations	TT	TT	TT	TT	TT
Traffic Volume (vph)	205	1220	610	20	5
Future Volume (vph)	205	1220	610	20	5
Ideal Flow (vphpl)	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
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00
Fpb. 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)	1686	3471	3450	1805	2608
Flt Permitted	0.34	1.00	1.00	0.95	1.00
Satd. Flow (perm)	585	3471	3450	1805	2608
Peak-Hour factor, PHF	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	241	1435	718	24	6
RTOR Reduction (vph)	0	0	1	0	0
Lane Group Flow (vph)	241	1435	741	0	6
Confl. Peds. (#/hr)	5		5		
Heavy Vehicles (%)	7%	4%	4%	5%	9%
Turn Type	pm-apt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2				4
Actuated Green, G (s)	117.2	117.2	101.5	10.4	10.4
Effective Green, g (s)	117.2	117.2	101.5	10.4	10.4
Actuated g/C Ratio	0.84	0.84	0.72	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)	573	2905	2501	134	193
v/s Ratio Prot	0.03	0.41	0.21	0.00	
v/c Ratio Perm	0.32				0.01
v/c Ratio	0.42	0.49	0.30	0.04	0.11
Uniform Delay, d1	2.7	3.2	6.7	60.2	60.5
Progression Factor	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.6	0.3	0.1	0.3
Delay (s)	3.3	3.8	7.0	60.3	60.7
Level of Service	A	A	A	E	E
Approach Delay (s)	3.7	7.0	60.7		
Approach LOS	A	A	E		
Intersection Summary					
HCM 2000 Control Delay	10.8		HCM 2000 Level of Service		
HCM 2000 Volume to Capacity ratio	0.49				
Actuated Cycle Length (s)	140.0				
Intersection Capacity Utilization	69.2%		Sum of lost time (s)		
Analysis Period (min)	15				
c Critical Lane Group	C				

HCM Unsignalized Intersection Capacity Analysis
 7: Kerr Street & Prince Charles Drive

Future Background AM
 Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	0	5	5	0	40	5	550	5	40	385	5
Traffic Volume (veh/h)	5	0	5	5	0	40	5	550	5	40	385	5
Future Volume (Veh/h)	5	0	5	5	0	40	5	550	5	40	385	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	6	0	6	6	0	48	6	655	6	48	458	6
Pedestrians	15			30								
Lane Width (m)	3.6			3.6								
Walking Speed (m/s)	1.1			1.1								
Percent Blockage	1			3								
Right turn flare (veh)							None	None	None	None	None	None
Median type												
Median storage (veh)												
Upstream signal (m)							238					127
pX platoon unblocked	0.91	0.91	0.84	0.91	0.91	0.87	0.84			0.87		
VC, conflicting volume	1290	1275	476	1263	1275	688	479			691		
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	950	933	286	920	933	568	290			571		
IC, single (s)	7.1	6.5	6.5	7.1	6.5	6.3	4.3			4.2		
IC, 2 stage (s)												
p0 queue free %	3.5	4.0	3.6	3.5	4.0	3.4	2.3			2.3		
p0 queue free %	97	100	99	97	100	89	99			94		
CM capacity (veh/h)	178	219	570	204	219	430	995			828		
Direction_Lane #	EB 1	WB 1	NB 1	SB 1	EB 1	NB 1	SB 1					
Volume Total	12	54	667	512								
Volume Left	6	6	6	48								
Volume Right	6	48	6	6								
cSH	271	383	985	828								
Volume to Capacity	0.04	0.14	0.01	0.06								
Queue Length 95th (m)	1.1	3.7	0.1	1.4								
Control Delay (s)	18.9	15.9	0.2	1.6								
Lane LOS	C	C	A	A								
Approach Delay (s)	18.9	15.9	0.2	1.6								
Approach LOS	C	C	A	A								
Intersection Summary												
Average Delay	1.6											
Intersection Capacity Utilization	57.4%											
ICU Level of Service	B											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
 8: Kerr Street & Elmwood Road

Future Background AM
 Upper Kerr Village (8/24-01)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W					
Traffic Volume (veh/h)	20	10	5	530	355	30
Future Volume (Veh/h)	20	10	5	530	355	30
Sign Control	Stop	Stop	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	24	12	6	624	418	35
Pedestrians	20					5
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	2			0		
Right turn flare (veh)				None	None	None
Median type						
Median storage (veh)						
Upstream signal (m)				103	262	
pX platoon unblocked	0.89	0.92	0.92			
VC, conflicting volume	1082	460	473			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	833	367	380			
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
p0 queue free %	3.5	3.3	2.2			
p0 queue free %	92	98	99			
CM capacity (veh/h)	297	612	1071			
Direction_Lane #	EB 1	NB 1	SB 1			
Volume Total	36	630	453			
Volume Left	24	6	0			
Volume Right	12	0	35			
cSH	359	1071	1700			
Volume to Capacity	0.10	0.01	0.27			
Queue Length 95th (m)	2.5	0.1	0.0			
Control Delay (s)	16.2	0.2	0.0			
Lane LOS	C	A	A			
Approach Delay (s)	16.2	0.2	0.0			
Approach LOS	C	A	A			
Intersection Summary						
Average Delay	0.6					
Intersection Capacity Utilization	43.4%					
ICU Level of Service	A					
Analysis Period (min)	15					

Timings
9: Kerr Street & Stewart Street

Queues
9: Kerr Street & Stewart Street

Future Background AM
Upper Kerr Village (8/24-01)

Future Background AM
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	35	25	20	35	5	425	40	285
Traffic Volume (vph)	35	25	20	35	5	425	40	285
Future Volume (vph)	Perm	NA	Perm	NA	Perm	NA	prn+pt	NA
Turn Type	4	8	8	2	2	1	6	6
Permitted Phases	4	8	8	2	2	1	6	6
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase	10.0	10.0	10.0	10.0	24.0	24.0	6.0	24.0
Minimum Initial (s)	30.0	30.0	30.0	30.0	32.0	32.0	10.0	32.0
Minimum Split (s)	30.0	30.0	30.0	30.0	35.0	35.0	10.0	45.0
Total Split (s)	40.0%	40.0%	40.0%	40.0%	46.7%	46.7%	13.3%	60.0%
Total Split (%)	24.6	24.6	24.6	24.6	29.6	29.6	7.0	39.6
Maximum Green (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.0	3.3
Yellow Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	2.1
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Total Lost Time (s)	Lead/Lag	Lag	Lag	Lead	Lead	Lead	Yes	Yes
Lead/Lag	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead-Lag Optimize?	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	None	None	None	None	C-Min	C-Min	None	C-Min
Recall Mode	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Walk Time (s)	13.0	13.0	13.0	13.0	14.0	14.0	14.0	14.0
Flash Dont Walk (s)	20	20	20	20	35	35	35	35
Pedestrian Calls (#/hr)	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								

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	79	152	548	434
v/c Ratio	0.28	0.40	0.47	0.42
Control Delay	23.8	14.2	9.7	9.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.8	14.2	9.7	9.1
Queue Length 50th (m)	9.6	8.7	25.0	18.5
Queue Length 95th (m)	15.4	16.8	62.6	48.7
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)	459	559	1156	1029
Base Capacity (vph)	0	0	0	0
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	0.17	0.27	0.47	0.42
Intersection Summary				



9: Kerr Street & Stewart Street

Future Background AM
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	35	25	5	20	35	70	5	425	20	40	285	30
Traffic Volume (vph)	35	25	5	20	35	70	5	425	20	40	285	30
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpt)	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99	1.00	0.99
Fpb. ped/bikes	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Frt	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Flt Protected	1701	1612	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775
Satd. Flow (prot)	0.79	0.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Permitted	1388	1532	1769	1769	1769	1769	1769	1769	1769	1769	1769	1769
Satd. Flow (perm)	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Peak-hour factor, PHF	43	30	6	24	43	85	6	518	24	49	348	37
Adj. Flow (vph)	0	5	0	0	68	0	0	1	0	0	3	0
RTOR Reduction (vph)	0	74	0	0	84	0	0	547	0	0	431	0
Lane Group Flow (vph)	20	20	20	20	30	20	30	35	35	35	30	30
Conf. Ped. (#/hr)	2%	7%	16%	0%	5%	4%	28%	6%	0%	2%	6%	6%
Heavy Vehicles (%)	0	2	0	0	2	0	0	0	0	0	0	4
Bus Blockages (#/hr)	Perm	NA	NA	Perm	NA	Perm	NA	NA	pm-pt	NA	NA	NA
Turn Type	4	4	4	8	8	2	2	2	1	6	6	6
Protected Phases	15.2	15.2	15.2	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0
Actuated Green, G (s)	0.20	0.20	0.20	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Effective Green, g (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Actuated G/C Ratio	281	310	1155	c0.31	c0.31	c0.31	c0.31	c0.31	c0.31	c0.31	c0.31	c0.31
Clearance Time (s)	0.26	0.27	0.47	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Vehicle Extension (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Grp. Cap. (vph)	0.7	0.6	1.4	7.9	7.9	6.5	6.5	6.5	6.5	6.5	6.5	6.5
v/s Ratio Prot	C	C	A	A	A	A	A	A	A	A	A	A
v/s Ratio Perm	C	C	C	7.9	7.9	6.5	6.5	6.5	6.5	6.5	6.5	6.5
v/c Ratio	10.8	10.8	10.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8
Uniform Delay, d1	68.4%	68.4%	68.4%	15	15	15	15	15	15	15	15	15
Progression Factor	15	15	15	15	15	15	15	15	15	15	15	15
Incremental Delay, d2	15	15	15	15	15	15	15	15	15	15	15	15
Delay (s)	15	15	15	15	15	15	15	15	15	15	15	15
Level of Service	15	15	15	15	15	15	15	15	15	15	15	15
Approach Delay (s)	15	15	15	15	15	15	15	15	15	15	15	15
Approach LOS	15	15	15	15	15	15	15	15	15	15	15	15
Intersection Summary	15	15	15	15	15	15	15	15	15	15	15	15
HCM 2000 Control Delay	15	15	15	15	15	15	15	15	15	15	15	15
HCM 2000 Volume to Capacity ratio	15	15	15	15	15	15	15	15	15	15	15	15
Actuated Cycle Length (s)	15	15	15	15	15	15	15	15	15	15	15	15
Intersection Capacity Utilization	15	15	15	15	15	15	15	15	15	15	15	15
Analysis Period (min)	15	15	15	15	15	15	15	15	15	15	15	15
Critical Lane Group	15	15	15	15	15	15	15	15	15	15	15	15

10: Donval Road & Wyecroft Road

Future Background AM
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	215	115	20	120	110	1260	145	985	145	985	145	985
Traffic Volume (vph)	215	115	20	120	110	1260	145	985	145	985	145	985
Future Volume (vph)	7	4	3	8	5	2	1	6	2	1	6	6
Turn Type	Prot	NA	pm-pt	NA	pm-pt	NA	Prot	NA	pm-pt	NA	Prot	NA
Protected Phases	7	4	3	8	5	2	1	6	2	1	6	6
Detector Phase	7	4	3	8	5	2	1	6	2	1	6	6
Switch Phase	7.0	10.0	7.0	10.0	7.0	20.0	7.0	20.0	7.0	7.0	20.0	20.0
Minimum Initial (s)	12.0	25.0	12.0	25.0	12.0	41.0	12.0	41.0	12.0	12.0	41.0	41.0
Minimum Split (s)	21.0	40.0	21.0	40.0	17.0	42.0	17.0	42.0	17.0	17.0	42.0	42.0
Total Split (%)	17.5%	33.3%	17.5%	33.3%	14.2%	35.0%	14.2%	35.0%	14.2%	14.2%	35.0%	35.0%
Maximum Green (s)	16.0	33.0	16.0	33.0	12.0	35.0	12.0	35.0	12.0	12.0	35.0	35.0
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	3.0	4.0	4.0
All-Red Time (s)	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	2.0	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)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
Recall Mode	None	None	None	None	None	None	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	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Intersection Summary	0	0	0	0	0	0	0	0	0	0	0	0
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 118 (98%), Referenced to phase 2:NETL and 6:SBT, Start of Green												
Natural Cycle: 90												
Control Type: Actuated-Coordinated												
Splits and Phases: 10: Donval Road & Wyecroft Road												

Queues
10: Dorval Road & Wynecroft Road

Future Background AM
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	234	239	22	358	120	1435	158	1549
v/c Ratio	0.60	0.30	0.09	0.65	0.53	0.62	0.44	0.69
Control Delay	56.6	21.3	29.4	23.6	25.3	13.2	53.6	26.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.6	21.3	29.4	23.6	25.3	13.2	53.6	26.5
Queue Length 50th (m)	27.0	11.6	3.7	15.3	6.4	86.6	18.2	96.2
Queue Length 95th (m)	40.0	24.4	9.2	29.0	m10.1	m105.0	28.0	134.3
Internal Link Dist (m)	155.6			199.3		494.4		672.1
Turn Bay Length (m)	115.0		145.0		65.0		125.0	
Base Capacity (vph)	416	928	351	1027	246	2310	379	2241
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.26	0.06	0.35	0.49	0.62	0.42	0.69
Intersection Summary								
m	Volume for 95th percentile queue is metered by upstream signal.							

HCM Signalized Intersection Capacity Analysis
10: Dorval Road & Wynecroft Road

Future Background AM
Upper Kerr Village (8/24-01)

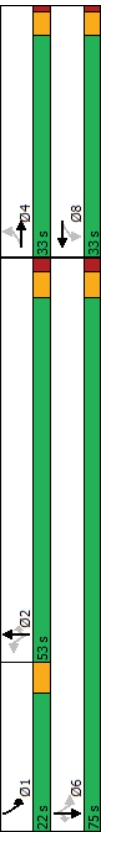
Movement	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	TT	TT	T	T	TT	TT	TT	TT	TT
Traffic Volume (vph)	215	115	105	20	120	210	110	1260	60
Future Volume (vph)	215	115	105	20	120	210	110	1260	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	0.95	1.00	0.91	1.00	0.97	0.91
Fpb. ped/bikes	1.00	0.99	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.93	1.00	0.90	1.00	0.99	1.00	0.95	1.00
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	3127	3066	1637	3135	1641	5033	3433	4665	3433
Flt Permitted	0.95	1.00	0.60	1.00	0.09	1.00	0.95	1.00	0.95
Satd. Flow (perm)	3127	3066	1039	3135	151	5033	3433	4665	3433
Peak-Hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	234	125	114	22	130	228	120	1370	65
RTOR Reduction (vph)	0	88	0	0	197	0	0	3	0
Lane Group Flow (vph)	234	151	0	22	161	0	120	1432	0
Confl. Peds. (#/hr)	2	3	3	3	2	1			1
Heavy Vehicles (%)	12%	7%	9%	10%	5%	2%	10%	2%	1%
Bus Blockages (#/hr)	0	2	0	0	0	0	3	0	0
Turn Type	Prot	NA	NA	pm-pt	NA	pm-pt	NA	Prot	NA
Protected Phases	7	4		3	8	5	2	1	6
Permitted Phases			8						
Actuated Green, G (s)	14.9	27.4	20.3	16.4	63.4	52.0	12.7	53.3	53.3
Effective Green, g (s)	14.9	27.4	20.3	16.4	63.4	52.0	12.7	53.3	53.3
Actuated g/C Ratio	0.12	0.23	0.17	0.14	0.53	0.43	0.11	0.44	0.44
Clearance Time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	388	700	195	428	221	2180	363	2072	363
v/s Ratio Prot	c0.07	0.05	0.00	c0.05	c0.05	0.28	0.05	c0.32	0.05
v/s Ratio Perm			0.02		0.23				
v/c Ratio	0.60	0.22	0.11	0.38	0.54	0.66	0.44	0.72	0.72
Uniform Delay, d1	49.8	37.6	42.0	47.1	18.2	26.9	50.3	27.3	27.3
Progression Factor	1.00	1.00	1.00	1.00	1.30	0.49	1.00	1.00	1.00
Incremental Delay, d2	3.9	0.3	0.5	1.2	2.4	0.8	1.7	2.2	2.2
Delay (s)	53.6	37.9	42.5	48.3	26.1	13.9	52.0	29.5	29.5
Level of Service	D	D	D	D	C	B	D	C	C
Approach Delay (s)									
Approach LOS	D	D	D	D	B	B	C	C	C
Intersection Summary									
HCM 2000 Control Delay	28.4								C
HCM 2000 Volume to Capacity ratio	0.62								
Actuated Cycle Length (s)	120.0								24.0
Intersection Capacity Utilization	71.7%								C
Analysis Period (min)	15								
c	Critical Lane Group								

HCAM Unsignalized Intersection Capacity Analysis
 1: Kerr Street & Wycroft Road
 Future Background PM
 Upper Kerr Village (8/24-01)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	25	115	105	670	535	110
Future Volume (Veh/h)	25	115	105	670	535	110
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.83	0.93	0.93	0.93
Hourly flow rate (vph)	27	124	113	720	575	118
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)				None	None	None
Median type						
Median storage (veh)						
Upstream signal (m)						
dx, platoon unblocked						
VC, conflicting volume	1225	352	688			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	1225	352	688			
IC, single (s)	6.8	7.0	4.2			
IC, 2 stage (s)	3.5	3.3	2.3			
po queue free %	82	81	87			
cm capacity (veh/h)	151	636	864			
Direction_Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	27	124	113	360	360	383 310
Volume Left	27	0	113	0	0	0 0
Volume Right	0	124	0	0	0	0 118
cSH	151	636	864	1700	1700	1700 1700
Volume to Capacity	0.18	0.19	0.13	0.21	0.21	0.23 0.18
Queue Length 95th (m)	4.8	5.5	3.4	0.0	0.0	0.0 0.0
Control Delay (s)	34.1	12.0	9.8	0.0	0.0	0.0 0.0
Lane LOS	D	B	A			
Approach Delay (s)	16.0		1.3			0.0
Approach LOS	C		A			
Intersection Summary						
Average Delay	2.1					
Intersection Capacity Utilization	37.5%					
Analysis Period (min)	15					
	ICU Level of Service A					

Timings
 2: Kerr Street & Shepherd Road
 Future Background PM
 Upper Kerr Village (8/24-01)

Lane Group	WBL	WBT	NBT	NBR	SBL	SBT	Ø4
Lane Configurations	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	105	0	580	120	155	460	
Future Volume (vph)	105	0	580	120	155	460	
Turn Type	Perm	NA	NA	Perm	pm+pt	NA	
Protected Phases	8	2			1	6	
Permitted Phases	8	8	2	2	6	6	
Detector Phase	8	8	2	2	1	6	
Switch Phase							
Minimum Initial (s)	5.0	5.0	18.0	18.0	7.0	18.0	5.0
Minimum Split (s)	22.0	22.0	28.2	28.2	11.0	28.2	22.0
Total Split (s)	33.0	33.0	53.0	53.0	22.0	75.0	33.0
Total Split (%)	30.6%	30.6%	49.1%	49.1%	20.4%	69.4%	31%
Maximum Green (s)	29.0	29.0	47.8	47.8	18.0	69.8	29.0
Yellow Time (s)	3.0	3.0	3.3	3.3	4.0	3.3	3.0
All-Red Time (s)	1.0	1.0	1.9	1.9	0.0	1.9	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	5.2	5.2	4.0	5.2	4.0
Lead/Lag			Lag	Lag	Lead	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.5	3.5	2.5	3.5	3.0
Minimum Gap (s)	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
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	Min	Min	None	Min	None
Walk Time (s)	7.0	7.0	10.0	10.0	10.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	13.0	13.0	13.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	5	5	5	5	0
Intersection Summary							
Cycle Length: 108							
Actuated Cycle Length: 49.4							
Natural Cycle: 65							
Control Type: Semi Ad-Uncoord							



Queues
2: Kerr Street & Shepherd Road

Future Background PM
Upper Kerr Village (8/24-01)

	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group	108	149	598	124	160	474
Lane Group Flow (vph)	0.41	0.23	0.44	0.19	0.27	0.21
v/c Ratio	23.2	0.8	13.0	3.7	5.2	4.7
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	23.2	0.8	13.0	3.7	5.2	4.7
Total Delay	8.0	0.0	18.6	0.0	4.2	7.5
Queue Length 50th (m)	21.6	0.0	35.9	8.0	11.5	15.7
Queue Length 95th (m)	241.3	143.2				21.4
Internal Link Dist (m)						
Turn Bay Length (m)	805	1102	3373	1467	835	3574
Base Capacity (vph)	0	0	0	0	0	0
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 v/c Ratio	0.13	0.14	0.18	0.08	0.19	0.13
Intersection Summary						

HCM Signalized Intersection Capacity Analysis
2: Kerr Street & Shepherd Road

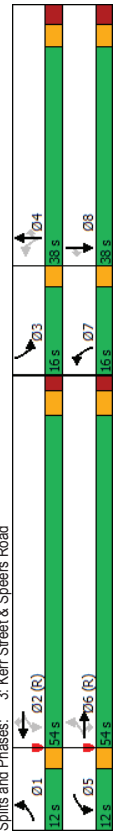
Future Background PM
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Traffic Volume (vph)	0	0	0	105	0	145	0	580	120	155	460	0
Future Volume (vph)	0	0	0	105	0	145	0	580	120	155	460	0
Ideal Flow (vphpb)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0			5.2	5.2	4.0	5.2	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Fpb. ped/bikes				1.00	0.98			1.00	0.97	1.00	1.00	
Fpb. ped/bikes				0.99	1.00			1.00	1.00	1.00	1.00	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1731	1573			3539	1543	1804	3574	
Flt Permitted				0.76	1.00			1.00	1.00	0.33	1.00	
Satd. Flow (perm)				1380	1573			3539	1543	625	3574	
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)	0	0	0	108	0	149	0	598	124	160	474	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	108	29	0	0	598	48	160	474	0
Confl. Peds. (#/hr)				15		5				5		
Heavy Vehicles (%)	2%	2%	2%	3%	2%	1%	2%	1%	2%	0%	1%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	5	0	0	0	0
Turn Type	Perm	Perm	NA	NA	NA	Perm	NA	NA	Perm	pm-pt	NA	Perm
Protected Phases		4		8			2			1		6
Permitted Phases	4			8	9.5	9.5	2		2	6		6
Actuated Green, G (s)				9.5	9.5	19.0	19.0	19.0	30.6	30.6		30.6
Effective Green, g (s)				9.5	9.5	19.0	19.0	19.0	30.6	30.6		30.6
Actuated G/C Ratio				0.19	0.19	0.39	0.39	0.39	0.62	0.62		0.62
Clearance Time (s)				4.0	4.0	5.2	5.2	4.0	5.2	4.0		5.2
Vehicle Extension (s)				3.0	3.0	3.5	3.5	3.5	2.5	2.5		3.5
Lane Grp Cap (vph)				265	303	1363	594	569	2218			
v/s Ratio Prot					0.02		0.17		0.04	0.13		
v/s Ratio Perm				0.41	0.09	0.44	0.08	0.28	0.21			
v/c Ratio				17.4	16.4	11.2	9.6	4.2	4.1			
Uniform Delay, d1				1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00
Progression Factor				1.0	0.1	0.3	0.1	0.2	0.1			
Incremental Delay, d2				18.5	16.5	11.5	9.7	4.4	4.1			
Delay (s)				B	B	B	A	A	A			
Level of Service				B	B	B	A	A	A			
Approach Delay (s)				0.0		17.3	11.2		4.2			
Approach LOS				A		B	B		A			
Intersection Summary												
HCM 2000 Control Delay				9.4		HCM 2000 Level of Service			A			
HCM 2000 Volume to Capacity ratio				0.40								
Actuated Cycle Length (s)				49.3		Sum of lost time (s)			13.2			
Intersection Capacity Utilization				52.4%		ICU Level of Service			A			
Analysis Period (min)				15								
c. Critical Lane Group												

Timings
3: Kerr Street & Speers Road

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	4	4	4	4	4	4	4	4	4	4	4
Traffic Volume (vph)	65	580	130	300	890	500	140	170	235	290	270	70
Future Volume (vph)	65	580	130	300	890	500	140	170	235	290	270	70
Turn Type	pm-pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	6	6	2	2	2	4	4	4	3	8	8
Permitted Phases	6	6	6	2	2	2	4	4	4	4	3	8
Detector Phase	1	6	6	2	2	2	4	4	4	4	3	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	16.0	38.0	38.0	16.0	38.0	38.0
Total Split (%)	10.0%	45.0%	45.0%	10.0%	45.0%	45.0%	13.3%	31.7%	31.7%	13.3%	31.7%	31.7%
Maximum Green (s)	9.0	48.1	48.1	9.0	48.1	48.1	13.0	31.7	31.7	13.0	31.7	31.7
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
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
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	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	14.0	14.0
Pedestrian Calls (#/hr)	15	15	15	15	15	15	15	35	35	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
3: Kerr Street & Speers Road

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	68	611	137	316	937	526	147	179	247	305	284	74
v/c Ratio	0.20	0.39	0.18	0.65	0.52	0.52	0.50	0.51	0.52	0.82	0.75	0.20
Control Delay	11.0	22.9	10.4	22.3	23.3	4.0	32.3	47.5	9.0	70.4	56.8	7.9
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	11.0	22.9	10.4	22.3	23.3	4.0	32.3	47.5	9.0	70.4	56.8	7.9
Queue Length 50th (m)	8.8	57.4	9.4	34.5	78.3	0.0	24.2	38.0	1.0	36.7	63.5	0.0
Queue Length 95th (m)	18.5	79.2	21.2	#71.6	115.5	21.7	35.1	54.8	20.5	#57.6	85.9	10.1
Internal Link Dist (m)	138.4			474.4			103.4				143.2	
Turn Bay Length (m)	105.0		75.0	75.0	1792	1011	319	495	570	381	501	456
Base Capacity (vph)	356	1568	772	487	1792	1011	319	495	570	381	501	456
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	0.19	0.39	0.18	0.65	0.52	0.52	0.46	0.36	0.43	0.80	0.57	0.16

Intersection Summary
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

3: Kerr Street & Speers Road
Future Background PM
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←	←	←	←	←	←	←	←	←	←	←	←
Traffic Volume (vph)	65	580	130	300	890	500	140	170	235	290	270	70
Future Volume (vph)	65	580	130	300	890	500	140	170	235	290	270	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	0.97	1.00	1.00	0.93
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00
Frb. ped/bikes	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1801	3511	1560	1750	3539	1485	1771	1877	1486	3467	1900	1501
Flt Permitted	0.25	1.00	1.00	0.33	1.00	1.00	0.32	1.00	0.32	1.00	0.85	1.00
Satd. Flow (perm)	468	3511	1560	617	3539	1485	601	1877	1486	3467	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	137	316	937	526	147	179	247	305	284	74
RTOR Reduction (vph)	0	0	76	0	0	263	0	0	196	0	0	59
Lane Group Flow (vph)	68	611	61	316	937	263	147	179	51	305	284	15
Confl. Peds. (#/hr)	30	5	5	5	5	30	35	35	35	35	35	35
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Bus Blockages (#/hr)	0	4	0	0	0	0	0	0	3	0	0	0
Turn Type	pm-pt	NA	Perm	pm-pt	NA	Perm	pm-pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	6	5	2	2	7	4			3	8	
Permitted Phases	6	6	2	2	2	4	4			4	8	
Actuated Green, G (s)	59.8	53.6	53.6	69.3	60.1	60.1	34.0	22.6	22.6	12.9	24.1	24.1
Effective Green, g (s)	59.8	53.6	53.6	69.3	60.1	60.1	34.0	22.6	22.6	12.9	24.1	24.1
Actuated G/C Ratio	0.50	0.45	0.45	0.58	0.50	0.50	0.28	0.19	0.19	0.11	0.20	0.20
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)	302	1568	696	476	1772	743	281	353	279	372	381	301
v/s Ratio Prot	0.01	0.17		c0.07	0.26		0.05	0.10		c0.09	c0.15	
v/s Ratio Perm	0.10		0.04	c0.31		0.18	0.10		0.03			0.01
v/s Ratio	0.23	0.39	0.09	0.66	0.53	0.35	0.52	0.51	0.18	0.82	0.75	0.05
Uniform Delay, d1	16.2	22.2	19.1	14.0	20.3	18.2	34.1	43.7	40.9	52.4	45.1	38.7
Progression Factor	0.79	0.94	2.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.7	0.2	3.1	1.1	1.3	1.3	1.6	0.4	12.9	8.2	0.1
Delay (s)	13.0	21.6	49.8	17.1	21.5	19.5	35.4	45.3	41.4	65.3	53.3	38.8
Level of Service	B	C	D	B	C	B	D	D	D	E	D	D
Approach Delay (s)							20.1			41.1		57.2
Approach LOS							C			D		E
Intersection Summary												
HCM 2000 Control Delay												C
HCM 2000 Volume to Capacity ratio												18.2
Actuated Cycle Length (s)												D
Intersection Capacity Utilization												15
Analysis Period (min)												
Critical Lane Group												

4: Dorval Road & Speers Road
Future Background PM
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←	←	←	←	←	←	←	←	←	←	←	←
Traffic Volume (vph)	415	515	50	195	690	475	65	615	270	685	375	
Future Volume (vph)	415	515	50	195	690	475	65	615	270	685	375	
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm+pt	NA	pm+pt	NA	Perm	
Protected Phases	7	4		3	8	1	5	2	1	6		
Permitted Phases	7	4	4	3	8	1	5	2	1	6		
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	7.0	20.0	20.0	
Minimum Split (s)	11.0	42.0	42.0	11.0	42.0	11.0	11.0	40.0	11.0	40.0	40.0	
Total Split (s)	19.0	44.0	44.0	17.0	42.0	19.0	11.0	40.0	19.0	48.0	48.0	
Total Split (%)	15.8%	36.7%	36.7%	14.2%	35.0%	15.8%	9.2%	33.3%	15.8%	40.0%	40.0%	
Maximum Green (s)	15.0	37.0	37.0	13.0	35.0	15.0	7.0	33.0	15.0	41.0	41.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	3.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	1.0	1.0	3.0	1.0	3.0	3.0	
Last 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	
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0	
Minimum Gap (s)	3.0	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	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	0.0	
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	C-Min
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	26.0
Pedestrian Calls (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 17 (14%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green												
Natural Cycle: 115												
Control Type: Actuated-Coordinated												

Queues
4: Dorval Road & Speers Road

Future Background PM
Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group	451	560	54	212	750	516	71	750	293	745	408
Lane Group Flow (vph)	0.92	0.50	0.09	0.54	0.78	0.72	0.25	0.79	0.89	0.68	0.51
v/c Ratio	75.8	35.8	0.3	33.1	54.8	23.3	21.2	46.8	59.9	16.9	2.7
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	75.8	35.8	0.3	33.1	54.8	23.3	21.2	46.8	59.9	16.9	2.7
Total Delay	#91.8	74.0	0.0	59.9	108.3	77.6	17.7	107.0	#99.8	29.4	3.7
Queue Length 50th (m)	412.3			472.1			621.6				494.4
Internal Link Dist (m)	60.0	85.0		55.0	70.0		110.0				
Turn Bay Length (m)	492	1118	588	406	1034	719	287	975	330	1292	806
Base Capacity (vph)	0	0	0	0	0	0	0	0	0	0	0
Stavation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.50	0.09	0.52	0.73	0.72	0.25	0.77	0.89	0.68	0.51
Intersection Summary											
~ Volume exceeds capacity, queue is theoretically infinite.											
Queue shown is maximum after two cycles.											
# 95th percentile volume exceeds capacity, queue may be longer.											
Queue shown is maximum after two cycles.											

HCM Signalized Intersection Capacity Analysis
4: Dorval Road & Speers Road

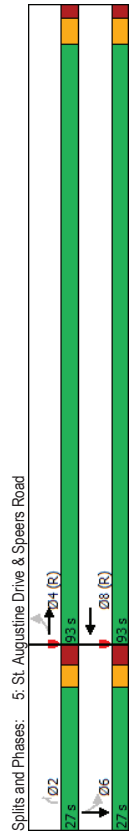
Future Background PM
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	FF	FF	F	FF	FF	F	FF	FF	FF	FF	FF
Traffic Volume (vph)	415	515	50	195	690	475	65	615	75	270	685
Future Volume (vph)	415	515	50	195	690	475	65	615	75	270	685
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Fpb. ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	1.00	1.00	0.85
Flt	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3560	1556	1786	3546	1581	1805	3516	1787	3574	1599
Flt Permitted	0.95	1.00	1.00	0.39	1.00	1.00	0.32	1.00	0.15	1.00	1.00
Satd. Flow (perm)	3433	3560	1556	724	3546	1581	608	3516	279	3574	1599
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
Adj. Flow (vph)	451	560	54	212	750	516	71	668	82	293	745
RTOR Reduction (vph)	0	0	37	0	0	43	0	8	0	0	230
Lane Group Flow (vph)	451	560	17	212	750	473	71	742	0	293	745
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	2%	1%	2%	1%	1%	1%	0%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	2	0	0	4	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm-pt	NA	pm-pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2	1	6	
Permitted Phases			4	8	3	8	2	2	6		6
Actuated Green, G (s)	17.2	37.4	37.4	44.6	32.4	48.5	38.1	32.3	52.4	42.6	42.6
Effective Green, g (s)	17.2	37.4	37.4	44.6	32.4	48.5	38.1	32.3	52.4	42.6	42.6
Actuated g/C Ratio	0.14	0.31	0.31	0.37	0.27	0.40	0.32	0.27	0.44	0.36	0.36
Clearance Time (s)	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	492	1109	484	377	957	638	250	946	324	1268	567
v/s Ratio Prot	c0.13	0.16		0.06	c0.21	0.10	0.01	0.21	c0.12	0.21	
v/s Ratio Perm			0.01	0.15		0.20	0.08		c0.27		0.11
v/c Ratio	0.92	0.50	0.03	0.56	0.78	0.74	0.28	0.78	0.90	0.59	0.31
Uniform Delay, d1	50.7	33.7	28.7	27.0	40.6	30.4	29.2	40.6	27.3	31.5	28.1
Progression Factor	1.00	1.00	1.00	1.42	1.20	0.80	1.00	1.00	1.48	0.48	0.17
Incremental Delay, d2	21.8	0.8	0.1	1.9	4.8	4.5	0.6	6.5	23.4	1.6	1.2
Delay (s)	72.5	34.5	28.8	40.3	53.6	28.9	29.8	47.1	63.8	16.9	5.9
Level of Service	E	C	C	D	D	C	C	D	E	B	A
Approach Delay (s)	50.3			43.1			45.6			23.3	
Approach LOS	D			D			D			C	
Intersection Summary											
HCM 2000 Control Delay	39.2										
HCM 2000 Volume to Capacity ratio	0.69										
Actuated Cycle Length (s)	120.0										
Intersection Capacity Utilization	85.1%										
Analysis Period (min)	15										
c. Critical Lane Group	E										

Timings 5. St. Augustine Drive & Speers Road Future Background PM Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	WBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	10	825	1120	25	5	0
Future Volume (vph)	10	825	1120	25	5	0
Turn Type	Perm	NA	NA	Perm	NA	NA
Protected Phases	4	8		8	6	
Permitted Phases	4	4	8	2	6	6
Detector Phase	4	4	8	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.9	23.9	23.9	24.3	24.3	24.3
Total Split (s)	93.0	93.0	93.0	27.0	27.0	27.0
Total Split (%)	77.5%	77.5%	77.5%	22.5%	22.5%	22.5%
Maximum Green (s)	87.1	87.1	87.1	20.7	20.7	20.7
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	2.2	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.9	5.9	6.3	6.3	6.3
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	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
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Min	C-Min	C-Min	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0

Intersection Summary
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 27 (23%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated



Queues 5. St. Augustine Drive & Speers Road Future Background PM Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	WBT	NBR	SBL	SBT
Lane Group Flow (vph)	10	885	1177	26	5	10
v/c Ratio	0.02	0.27	0.36	0.09	0.06	0.05
Control Delay	1.1	0.9	2.5	0.6	55.4	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.1	0.9	2.5	0.6	55.4	0.5
Queue Length 50th (m)	0.2	9.5	90.7	0.0	1.2	0.0
Queue Length 95th (m)	m0.3	m9.1	2.0	0.0	5.3	0.0
Internal Link Dist (m)		472.1	49.4			93.6
Turn Bay Length (m)		50.0				
Base Capacity (vph)	403	3225	3240	472	311	384
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 v/c Ratio	0.02	0.27	0.36	0.06	0.02	0.03

Intersection Summary
 m Volume for 95th percentile queue is metered by upstream signal.

Future Background PM
Upper Kerr Village (8/24-01)

5. St. Augustine Drive & Speers Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	4	4	5	4	4	5	4	4	5	4	4
Traffic Volume (vph)	10	825	25	0	1120	10	0	0	25	5	0	10
Future Volume (vph)	10	825	25	0	1120	10	0	0	25	5	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9	5.9	5.9	5.9	5.9	6.3	6.3	6.3	6.3	6.3	6.3
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.86	1.00	0.85	1.00	0.85	1.00
Ft	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1800	3552	3569	3569	3569	3569	1644	1805	1615	1644	1805	1615
Flt Permitted	0.23	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	444	3552	3569	3569	3569	3569	1644	1805	1615	1644	1805	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	10	859	26	0	1167	10	0	0	26	5	0	10
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	25	0	0	10
Lane Group Flow (vph)	0	884	0	0	1177	0	0	0	1	5	0	0
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	NA	NA	NA	NA	NA	NA	Perm	Perm	NA	NA
Protected Phases	4											6
Permitted Phases	4											6
Actuated Green, G (s)	104.0	104.0			104.0				3.8	3.8		3.8
Effective Green, g (s)	104.0	104.0			104.0				3.8	3.8		3.8
Actuated G/C Ratio	0.87	0.87			0.87				0.03	0.03		0.03
Clearance Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	6.3	6.3	6.3	6.3	6.3	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	384	3078			3093				52	57		51
v/s Ratio Prot	0.25				c0.33							0.00
v/s Ratio Perm	0.02				0.00				0.00	c0.00		0.00
v/c Ratio	0.03	0.29			0.38				0.02	0.09		0.01
Uniform Delay, d1	1.1	1.4			1.6				56.3	56.4		56.3
Progression Factor	0.66	0.60			1.49				1.00	1.00		1.00
Incremental Delay, d2	0.1	0.2			0.3				0.1	0.7		0.0
Delay (s)	0.8	1.0			2.7				56.4	57.1		56.3
Level of Service	A	A			A				E	E		E
Approach Delay (s)	1.0				2.7				56.4			56.6
Approach LOS	A				A				E			E
Intersection Summary												
HCM 2000 Control Delay	3.0 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.37											
Actuated Cycle Length (s)	120.0											
Sum of lost time (s)	12.2											
Intersection Capacity Utilization	47.4%											
ICU Level of Service	A											
Analysis Period (min)	15											
c Critical Lane Group												

Future Background PM
Upper Kerr Village (8/24-01)

6. Speers Road/Cornwall Road & Cross Avenue

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	5	4	4	5	4
Traffic Volume (vph)	265	745	1305	10	420
Future Volume (vph)	265	745	1305	10	420
Turn Type	pm-pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	4
Permitted Phases	5	2	6	4	4
Detector Phase	5	2	6	4	4
Switch Phase	6.0	38.0	38.0	10.0	10.0
Minimum Initial (s)	12.0	47.6	47.6	15.8	15.8
Minimum 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	Lag		
Lead-Lag Optimize?	Yes	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	10.0		
Flash Dont Walk (s)	31.0	31.0	31.0		
Pedestrian Calls (#/hr)	5	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				
Spits and Phases	6: Speers Road/Cornwall Road & Cross Avenue				
Diagram					

Queues
6: Speers Road/Cornwall Road & Cross Avenue

HCM Signalized Intersection Capacity Analysis
6: Speers Road/Cornwall Road & Cross Avenue

Future Background PM
Upper Kerr Village (8/24-01)

Future Background PM
Upper Kerr Village (8/24-01)

	EBL	EBT	WBT	SBL	SBR
Lane Group	276	776	1375	10	438
Lane Group Flow (vph)	0.64	0.27	0.65	0.05	0.80
v/c Ratio	26.0	3.8	21.4	54.3	30.6
Control Delay	0.0	0.0	0.0	0.0	0.0
Queue Delay	26.0	3.8	21.4	54.3	30.6
Total Delay	67.0	37.0	162.8	7.8	40.2
Queue Length 50th (m)		474.4	77.5	60.0	
Internal Link Dist (m)				45.0	
Turn Bay Length (m)				415	858
Base Capacity (vph)	0	0	0	0	0
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	0.64	0.27	0.65	0.02	0.51
Intersection Summary					

Movement	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔
Traffic Volume (vph)	265	745	1305	15	420
Future Volume (vph)	265	745	1305	15	420
Ideal Flow (vphpb)	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
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00
Fibb. 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	0.11	1.00	1.00	0.95	1.00
Satd. Flow (perm)	201	3610	3567	1805	2733
Peak-Hour factor, PHF	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	276	776	1359	16	438
RTOR Reduction (vph)	0	0	0	0	269
Lane Group Flow (vph)	276	776	1375	0	169
Confl. Peds. (#/hr)	5	5	5	5	5
Heavy Vehicles (%)	6%	0%	1%	0%	4%
Turn Type	pm>pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2			4	
Actuated Green, G (s)	113.4	113.4	82.4	14.2	14.2
Effective Green, g (s)	113.4	113.4	82.4	14.2	14.2
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)	431	2924	2099	183	277
v/s Ratio Prot	c0.11	0.21	0.39	0.01	
v/c Ratio Perm	c0.41				c0.06
v/c Ratio	0.64	0.27	0.65	0.05	0.61
Uniform Delay, d1	25.3	3.2	19.3	56.8	60.3
Progression Factor	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.4	0.2	1.6	0.1	4.0
Delay (s)	28.7	3.4	20.9	57.0	64.2
Level of Service	C	A	C	E	E
Approach Delay (s)	10.1	20.9	64.1		
Approach LOS	B	C	E		
Intersection Summary					
HCM 2000 Control Delay			23.7	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			74.9%	ICU Level of Service	D
Analysis Period (min)			15		
c Critical Lane Group					

7: Kerr Street & Prince Charles Drive

8: Kerr Street & Elmwood Road

Future Background PM
Upper Kerr Village (8/24-01)

Future Background PM
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4		4				4			4	
Traffic Volume (veh/h)	10	0	10	10	0	30	5	520	10	20	665	25
Future Volume (Veh/h)	10	0	10	10	0	30	5	520	10	20	665	25
Sign Control	Stop	0%	Stop	0%	0%	Free	0%	Free	0%	Free	0%	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	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	700	26
Pedestrians	20			30							5	
Lane Width (m)	3.6			3.6							3.6	
Walking Speed (m/s)	1.1			1.1							1.1	
Percent Blockage	2			3							0	
Right turn flare (veh)							None	None	None			
Median type							None	None	None			
Median storage (veh)												
Upstream signal (m)								238			127	
pX platoon unblocked	0.78	0.78	0.75	0.78	0.78	0.94	0.75	0.75	0.84		0.84	
VC, conflicting volume	1374	1373	733	1358	1380	588	746		588			
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	1155	1154	479	1135	1163	525	497		525			
IC, single (s)	7.1	7.0	6.2	7.1	6.5	6.2	4.3		4.1			
IC, 2 stage (s)												
p0 queue free %	3.5	4.5	3.3	3.5	4.0	3.3	2.4		2.2			
IF (s)	91	100	97	91	100	94	99		98			
CM capacity (veh/h)	119	117	436	127	143	504	723		934			
Direction_Lane #	EB 1	WB 1	NB 1	SB 1	SB 1							
Volume Total	22	43	563	747								
Volume Left	11	11	5	21								
Volume Right	11	32	11	26								
cSH	187	287	723	934								
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)	26.9	19.8	0.2	0.6								
Lane LOS	D	C	A	A								
Approach Delay (s)	26.9	19.8	0.2	0.6								
Approach LOS	D	C	A	A								
Intersection Summary												
Average Delay	1.4											
Intersection Capacity Utilization	60.9%											
ICU Level of Service	B											
Analysis Period (min)	15											

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			4	4	
Traffic Volume (veh/h)	15	10	5	515	625	40
Future Volume (Veh/h)	15	10	5	515	625	40
Sign Control	Stop	Free	Free	0%	0%	0%
Grade	0%	0%	0%	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	542	658	42
Pedestrians	35					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	3					
Right turn flare (veh)				None	None	
Median type				None	None	
Median storage (veh)						
Upstream signal (m)				103	262	
pX platoon unblocked	0.84	0.79	0.79			
VC, conflicting volume	1266	714	735			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	960	506	532			
IC, single (s)	6.4	6.3	4.3			
IC, 2 stage (s)						
IF (s)	3.5	3.4	2.4			
p0 queue free %	93	97	99			
CM capacity (veh/h)	232	422	727			
Direction_Lane #	EB 1	NB 1	SB 1			
Volume Total	27	547	700			
Volume Left	16	5	0			
Volume Right	11	0	42			
cSH	284	727	1700			
Volume to Capacity	0.10	0.01	0.41			
Queue Length 95th (m)	2.4	0.2	0.0			
Control Delay (s)	19.0	0.2	0.0			
Lane LOS	C	A	A			
Approach Delay (s)	19.0	0.2	0.0			
Approach LOS	C	A	A			
Intersection Summary						
Average Delay	0.5					
Intersection Capacity Utilization	45.5%					
ICU Level of Service	A					
Analysis Period (min)	15					

Timings
9: Kerr Street & Stewart Street

Queues
9: Kerr Street & Stewart Street

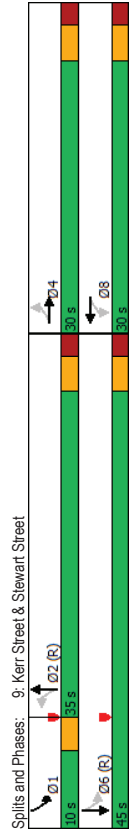
Future Background PM
Upper Kerr Village (8/24-01)

Future Background PM
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	EB	EB	WB	WB	NB	NB	SB	SB
Traffic Volume (vph)	50	10	10	15	10	395	55	515
Future Volume (vph)	50	10	10	15	10	395	55	515
Turn Type	Perm	NA	Perm	NA	Perm	NA	prn+pt	NA
Protected Phases	4	4	8	8	2	2	1	6
Permitted Phases	4	4	8	8	2	2	1	6
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase	4	4	8	8	2	2	1	6
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	0.0	0.0
Total Lost Time (s)	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Lead/Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	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	C-Min	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

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	81	109	456	674
v/c Ratio	0.29	0.29	0.35	0.56
Control Delay	21.6	10.0	7.9	11.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.6	10.0	7.9	11.1
Queue Length 50th (m)	8.5	3.4	18.8	34.7
Queue Length 95th (m)	16.5	13.0	56.0	105.2
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)	444	552	1295	1195
Base Capacity (vph)	0	0	0	0
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	0.18	0.20	0.35	0.56

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



Queues
10: Dorval Road & Wycroft Road

Future Background PM
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group	418	435	65	98	516	103	1418	120	1429
Lane Group Flow (vph)	0.98	0.57	0.23	0.46	0.88	0.41	0.80	0.18	0.63
v/c Ratio	90.1	29.0	30.2	54.9	46.5	13.4	35.6	40.1	27.1
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	90.1	29.0	30.2	54.9	46.5	13.4	35.6	40.1	27.1
Total Delay	51.2	29.4	11.0	21.9	88.8	8.2	129.3	11.8	88.3
Queue Length 50th (m)	#82.7	44.2	19.5	36.3	123.3	m11.8	m151.7	20.5	124.5
Queue Length 95th (m)	155.6	145.0	199.3	494.4	672.1	672.1	672.1	672.1	672.1
Internal Link Dist (m)	115.0				65.0	125.0			
Turn Bay Length (m)	428	1016	367	474	584	275	1765	677	2265
Base Capacity (vph)	0	0	0	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.43	0.18	0.21	0.88	0.37	0.80	0.18	0.63

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
10: Dorval Road & Wycroft Road

Future Background PM
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	TT	TT	TT	T	T	T	T	TT	TT	TT	TT	TT
Traffic Volume (vph)	385	215	185	60	90	475	95	1265	40	110	1105	210
Future Volume (vph)	385	215	185	60	90	475	95	1265	40	110	1105	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.97	0.91	0.97	0.91
Fpb. ped/bikes	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.93	1.00	1.00	0.85	1.00	1.00	0.95	1.00	0.95	1.00	0.98
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	3213	3217	1783	1727	1590	1736	5040	3502	4964	3502	4964	3502
Flt Permitted	0.95	1.00	0.49	1.00	1.00	0.14	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (perm)	3213	3217	927	1727	1590	257	5040	3502	4964	3502	4964	3502
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)	418	234	201	65	98	516	103	1375	43	120	1201	228
RTOR Reduction (vph)	0	147	0	0	0	55	0	3	0	0	18	0
Lane Group Flow (vph)	418	288	0	65	98	461	103	1415	0	120	1411	0
Confl. Peds. (#/hr)	1	4	4	4	4	1	1	1	1	1	1	1
Heavy Vehicles (%)	9%	4%	2%	1%	10%	1%	4%	2%	2%	0%	1%	5%
Bus Blockages (#/hr)	0	2	0	0	0	0	0	3	0	0	0	0
Turn Type	Prot	NA	NA	pm-pt	NA	pm-ov	pm-pt	NA	Prot	NA	Prot	NA
Protected Phases	7	4		3	8	1	5	2			1	6
Permitted Phases				8		8		2				
Actuated Green, G (s)	16.0	22.8	24.8	15.8	39.0	51.9	41.0	23.2	53.3	23.2	53.3	53.3
Effective Green, g (s)	16.0	22.8	24.8	15.8	39.0	51.9	41.0	23.2	53.3	23.2	53.3	53.3
Actuated g/C Ratio	0.13	0.19	0.21	0.13	0.32	0.43	0.34	0.19	0.44	0.19	0.44	0.44
Clearance Time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	428	611	255	227	516	245	1722	677	2204	677	2204	2204
v/s Ratio Prot	c0.13	0.09	0.02	0.06	c0.17	0.04	c0.28	0.03	0.28	0.03	0.28	0.28
v/s Ratio Perm	0.03		0.03	0.12	0.14							
v/c Ratio	0.98	0.47	0.25	0.43	0.89	0.42	0.82	0.18	0.64	0.18	0.64	0.64
Uniform Delay, d1	51.8	43.2	39.2	48.0	38.5	20.9	36.2	40.4	25.9	40.4	25.9	25.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	0.75	0.90	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	37.4	1.2	1.1	2.7	18.6	1.4	2.7	0.3	1.4	0.3	1.4	1.4
Delay (s)	89.2	44.4	40.3	50.7	57.1	17.2	35.3	40.7	27.3	40.7	27.3	27.3
Level of Service	F	D	D	D	E	B	D	D	C	D	C	C
Approach Delay (s)	F	D	D	D	E	B	D	D	C	D	C	C
Approach LOS	E	E	E	E	D	C	C	C	C	C	C	C

Intersection Summary	41.2	HCM 2000 Level of Service	D
HCM 2000 Control Delay	0.68		
HCM 2000 Volume to Capacity ratio	120.0	Sum of lost time (s)	24.0
Actuated Cycle Length (s)	83.0%	ICU Level of Service	E
Intersection Capacity Utilization	15		
Analysis Period (min)			
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 1: Kerr Street & Wycroft Road

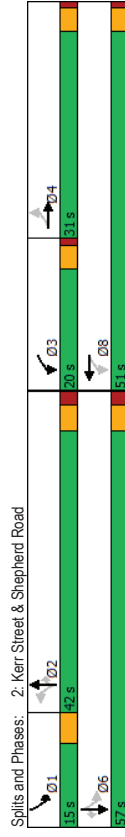
Future Total AM (Interim)
 Upper Kerr Village (8/24-01)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	5	95	210	350	505	125
Traffic Volume (veh/h)	5	95	210	350	505	125
Future Volume (Veh/h)	5	95	210	350	505	125
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	5	101	223	372	537	133
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	None
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	1236	335	670			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	1236	335	670			
IC, single (s)	6.8	7.0	4.1			
IC, 2 stage (s)	3.5	3.3	2.2			
p0 queue free %	96	85	76			
CM capacity (veh/h)	130	658	916			
Direction_Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	5	101	223	186	186	358 312
Volume Left	5	0	223	0	0	0 0
Volume Right	0	101	0	0	0	0 133
cSH	130	658	916	1700	1700	1700
Volume to Capacity	0.04	0.15	0.24	0.11	0.11	0.21 0.18
Queue Length 95th (m)	0.9	4.1	7.3	0.0	0.0	0.0 0.0
Control Delay (s)	33.9	11.5	10.2	0.0	0.0	0.0 0.0
Lane LOS	D	B	B			
Approach Delay (s)	12.5		3.8			0.0
Approach LOS	B					
Intersection Summary						
Average Delay			2.6			
Intersection Capacity Utilization			42.9%			ICU Level of Service
Analysis Period (min)			15			A

Timings
 2: Kerr Street & Shepherd Road

Future Total AM (Interim)
 Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	10	115	5	55	280	65	90	435	20
Traffic Volume (vph)	55	10	115	5	55	280	65	90	435	20
Future Volume (vph)	55	10	115	5	55	280	65	90	435	20
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	3	8	2	2	2	2	1	6	6
Permitted Phases	4	4	3	8	2	2	2	1	6	6
Detector Phase										
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	18.0	18.0	18.0	7.0	18.0	18.0
Minimum Split (s)	22.0	22.0	9.0	22.0	28.2	28.2	28.2	11.0	28.2	28.2
Total Split (s)	31.0	31.0	20.0	51.0	42.0	42.0	42.0	15.0	57.0	57.0
Total Split (%)	28.7%	28.7%	18.5%	47.2%	38.9%	38.9%	38.9%	13.9%	52.8%	52.8%
Maximum Green (s)	27.0	27.0	16.0	47.0	36.8	36.8	36.8	11.0	51.8	51.8
Yellow Time (s)	3.0	3.0	3.0	3.0	3.3	3.3	3.3	4.0	3.3	3.3
All-Red Time (s)	1.0	1.0	1.0	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	4.0	4.0	5.2	5.2	5.2	4.0	5.2	5.2
Lead/Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	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
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	None	None	None	Min	Min	Min	None	Min	Min
Walk Time (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)	11.0	11.0	11.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Pedestrian Calls (#/hr)	0	0	0	0	5	5	5	5	5	5
Intersection Summary										
Cycle Length: 108										
Actuated Cycle Length: 57.1										
Natural Cycle: 75										
Control Type: Semi Ad-Uncooord										



Queues
2: Kerr Street & Shepherd Road

Future Total AM (Interim)
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	60	49	126	241	60	308	71	99	478	22
Lane Group Flow (vph)	0.34	0.17	0.31	0.36	0.19	0.25	0.12	0.17	0.27	0.03
v/c Ratio	30.8	13.2	16.3	4.2	19.4	17.2	3.9	9.4	9.8	1.1
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	30.8	13.2	16.3	4.2	19.4	17.2	3.9	9.4	9.8	1.1
Total Delay	17.8	9.6	22.2	12.9	15.1	26.5	5.9	14.1	28.7	1.2
Queue Length 50th (m)	6.0	1.1	9.3	0.3	4.8	13.2	0.0	5.1	14.9	0.0
Queue Length 95th (m)	17.8	9.6	22.2	12.9	15.1	26.5	5.9	14.1	28.7	1.2
Internal Link Dist (m)	99.1		241.3		143.2				21.4	
Turn Bay Length (m)					50.0				50.0	
Base Capacity (vph)	578	858	579	1317	597	2343	1028	650	3020	1371
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	0.06	0.22	0.18	0.10	0.13	0.07	0.15	0.16	0.02
Intersection Summary										

HCM Signalized Intersection Capacity Analysis
2: Kerr Street & Shepherd Road

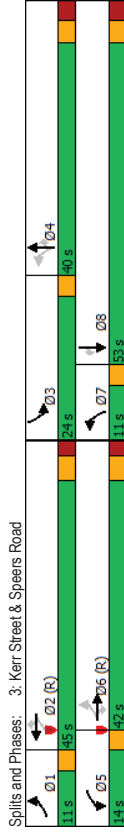
Future Total AM (Interim)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	55	10	35	115	5	215	55	280	65	90
Traffic Volume (vph)	55	10	35	115	5	215	55	280	65	90
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fibb. 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	0.85	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1770	1646	1668	1594	1770	3497	1498	1784	3505	1583
Flt Permitted	0.61	1.00	0.50	1.00	0.48	1.00	1.00	0.47	1.00	1.00
Satd. Flow (perm)	1134	1646	875	1594	892	3497	1498	885	3505	1583
Peak-Hour factor, PHF	0.92	0.92	0.91	0.92	0.91	0.92	0.91	0.91	0.91	0.92
Adj. Flow (vph)	60	11	38	126	5	236	60	308	71	99
RTOR Reduction (vph)	0	32	0	0	157	0	0	0	47	0
Lane Group Flow (vph)	60	17	0	126	84	0	60	308	24	99
Confl. Peds. (#/hr)	2%	2%	2%	8%	2%	0%	2%	2%	5%	1%
Heavy Vehicles (%)	0	0	0	0	0	0	0	0	0	0
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0
Turn Type	Perm	NA	NA	pm-pt	NA	Perm	NA	Perm	pm-pt	NA
Protected Phases	4	3	8	8	2	2	2	1	6	6
Permitted Phases	4	8	8	8	2	2	2	2	6	6
Actuated Green, G (s)	8.8	8.8	19.6	19.6	20.2	20.2	20.2	29.8	29.8	29.8
Effective Green, g (s)	8.8	8.8	19.6	19.6	20.2	20.2	20.2	29.8	29.8	29.8
Actuated g/C Ratio	0.15	0.15	0.33	0.33	0.34	0.34	0.34	0.51	0.51	0.51
Clearance Time (s)	4.0	4.0	4.0	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)	170	247	384	533	307	1205	516	535	1782	805
v/s Ratio Prot	0.01	c0.04	0.05	0.07	0.09	0.02	0.08	0.02	c0.14	0.01
v/s Ratio Perm	0.05	c0.07	0.33	0.16	0.20	0.26	0.05	0.19	0.27	0.01
Uniform Delay, d1	22.3	21.4	14.2	13.7	13.5	13.8	12.8	7.6	8.2	7.1
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	1.3	0.1	0.5	0.1	0.4	0.1	0.0	0.1	0.1	0.0
Delay (s)	23.6	21.5	14.7	13.8	13.9	13.9	12.8	7.8	8.3	7.1
Level of Service	C	C	B	B	B	B	B	A	A	A
Approach Delay (s)	22.7		14.1		13.7			8.2		A
Approach LOS	C		B		B			A		A
Intersection Summary										
HCM 2000 Control Delay	12.3									
HCM 2000 Volume to Capacity ratio	0.34									
Actuated Cycle Length (s)	56.6									
Intersection Capacity Utilization	63.7%									
Analysis Period (min)	15									
c. Critical Lane Group	B									

Timings 3: Kerr Street & Speers Road Future Total AM (Interim) Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	85	705	85	195	550	185	100	130	370	365	175	85
Traffic Volume (vph)	85	705	85	195	550	185	100	130	370	365	175	85
Future Volume (vph)	85	705	85	195	550	185	100	130	370	365	175	85
Turn Type	pm-pt	NA	Perm	pm-pt	NA	Perm	pm-pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	6	6	2	2	2	4	4	4	3	8	8
Permitted Phases	6	6	6	2	2	2	4	4	4	3	8	8
Detector Phase	1	6	6	2	2	2	4	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
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
Recall Mode	None	C-Min	None	C-Min	None	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	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	14.0	14.0
Pedestrian Calls (#/hr)	15	15	15	15	15	15	15	35	35	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



Queues 3: Kerr Street & Speers Road Future Total AM (Interim) Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	99	820	99	227	640	215	116	151	430	424	203	99
v/c Ratio	0.28	0.71	0.18	0.76	0.49	0.30	0.28	0.34	0.91	0.81	0.33	0.17
Control Delay	16.4	32.1	4.2	38.7	31.3	5.1	20.5	38.4	50.5	61.2	30.0	5.3
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	16.4	32.1	4.2	38.7	31.3	5.1	20.5	38.4	50.5	61.2	30.0	5.3
Queue Length 50th (m)	7.9	98.4	1.4	32.7	64.3	0.0	14.5	28.2	61.5	49.7	33.4	0.0
Queue Length 95th (m)	17.0	117.9	5.3	#62.4	79.3	13.9	23.0	43.5	#02.1	63.0	47.9	9.5
Internal Link Dist (m)	145.3			474.4			103.4					143.2
Turn Bay Length (m)	105.0		75.0	75.0		100.0	50.0		45.0	80.0		75.0
Base Capacity (vph)	361	1149	562	300	1317	705	412	517	521	583	718	648
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	0.27	0.71	0.18	0.76	0.49	0.30	0.28	0.29	0.83	0.73	0.28	0.15

Intersection Summary
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

3: Kerr Street & Speers Road

Future Total AM (Interim)

Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	85	705	85	195	550	185	100	130	370	365	175	85
Traffic Volume (vph)	85	705	85	195	550	185	100	130	370	365	175	85
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpt)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1800	3378	1437	1687	3438	1495	1676	1844	1429	3335	1845	1511
Flt Permitted	0.35	1.00	1.00	0.17	1.00	1.00	0.63	1.00	1.00	0.85	1.00	1.00
Satd. Flow (perm)	660	3378	1437	303	3438	1495	1112	1844	1429	3335	1845	1511
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	99	820	99	227	640	215	116	151	430	424	203	99
RTOR Reduction (vph)	0	0	65	0	0	133	0	0	127	0	0	66
Lane Group Flow (vph)	99	820	34	227	640	82	116	151	303	424	203	33
Conf. Ped. (#/hr)	15	10	10	10	10	15	20	15	35	35	20	20
Heavy Vehicles (%)	0%	6%	7%	7%	5%	4%	6%	1%	5%	5%	3%	2%
Bus Blockages (#/hr)	0	4	0	0	0	0	0	5	0	0	0	0
Turn Type	pm-pt	NA	Perm	pm-pt	NA	Perm	pm-pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	6	5	2	2	7	4					
Permitted Phases	6	6	2	2	4							
Actuated Green, G (s)	48.7	40.9	40.9	56.8	46.0	46.0	37.0	29.1	29.1	18.9	40.1	40.1
Effective Green, g (s)	48.7	40.9	40.9	56.8	46.0	46.0	37.0	29.1	29.1	18.9	40.1	40.1
Actuated G/C Ratio	0.41	0.34	0.34	0.47	0.38	0.38	0.31	0.24	0.24	0.16	0.33	0.33
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)	341	1151	489	292	1317	573	379	447	346	525	616	504
v/s Ratio Prot	0.02	0.24		c0.08	0.19		0.02	0.08		c0.13	0.11	
v/s Ratio Perm	0.10	0.02	0.02	0.06	0.07		0.06		0.21		0.02	
v/s Ratio	0.29	0.71	0.07	0.78	0.49	0.14	0.31	0.34	0.88	0.81	0.33	0.07
Uniform Delay, d1	22.6	34.4	26.7	22.5	28.0	24.1	30.8	37.5	43.7	48.8	29.9	27.2
Progression Factor	0.77	0.78	0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	3.7	0.3	11.8	1.3	0.5	0.3	0.6	21.8	8.6	0.4	0.1
Delay (s)	17.8	30.7	21.6	34.2	29.3	24.7	31.2	38.1	65.5	57.4	30.3	27.3
Level of Service	B	C	C	C	C	C	C	C	D	E	E	C
Approach Delay (s)	28.5			29.4			53.9			45.7		
Approach LOS	C			C			D			D		
Intersection Summary												
HCM 2000 Control Delay	37.4 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.83											
Actuated Cycle Length (s)	120.0 Sum of lost time (s)											
Intersection Capacity Utilization	73.5% ICU Level of Service											
Analysis Period (min)	15											
Critical Lane Group	c											

4: Dorval Road & Speers Road

Future Total AM (Interim)

Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	
Lane Group												
Lane Configurations	415	590	40	85	395	310	70	825	265	515	255	
Traffic Volume (vph)	415	590	40	85	395	310	70	825	265	515	255	
Future Volume (vph)	Prot	NA	Perm	pm-pt	NA	pm+ov	pm+pt	NA	pm+pt	NA	Perm	
Turn Type	7	4	4	3	8	1	5	2	1	6		
Protected Phases	7	4	4	8	8	2	2	1	6			
Detector Phase	7	4	4	3	8	1	5	2	1	6		
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	7.0	20.0	20.0	
Minimum Split (s)	11.0	42.0	42.0	11.0	42.0	11.0	11.0	40.0	11.0	40.0	40.0	
Total Split (s)	21.0	50.0	50.0	13.0	42.0	12.0	11.0	45.0	12.0	46.0	46.0	
Total Split (%)	17.5%	41.7%	41.7%	10.8%	35.0%	10.0%	9.2%	37.5%	10.0%	38.3%	38.3%	
Maximum Green (s)	17.0	43.0	43.0	9.0	35.0	8.0	7.0	38.0	8.0	39.0	39.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	3.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	1.0	1.0	3.0	1.0	3.0	3.0	
Last 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	
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0	
Minimum Gap (s)	3.0	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	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	0.0	
Recall Mode	None	None	None	None	None	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	7.0	7.0	7.0	
Flash Dont Walk (s)	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	
Pedestrian Calls (#/hr)	5	5	5	5	5	5	5	5	5	5	5	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 41 (34%), Referenced to phase 2:NBLT and 6:SBTL, Start of Green												
Natural Cycle: 725												
Control Type: Actuated-Coordinated												
Splits and Phases:	4: Dorval Road & Speers Road											

Queues
4: Dorval Road & Speers Road

Future Total AM (Interim)
Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group	451	641	43	92	429	337	76	1038	288	560	277
Lane Group Flow (vph)	0.94	0.69	0.09	0.37	0.64	0.53	0.19	0.93	0.91	0.37	0.36
v/c Ratio	79.4	42.5	0.3	19.0	37.1	11.0	17.9	54.8	58.2	10.3	2.9
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	79.4	42.5	0.3	19.0	37.1	11.0	17.9	54.8	58.2	10.3	2.9
Total Delay	54.8	72.6	0.0	7.0	34.1	2.6	8.3	123.0	28.5	33.3	9.5
Queue Length 50th (m)	#85.1	80.6	0.0	8.9	44.3	39.1	19.6	#163.8	#34.9	42.1	14.3
Queue Length 95th (m)	412.3			472.1			621.6		494.4		
Internal Link Dist (m)	60.0			85.0			55.0	70.0	110.0		
Turn Bay Length (m)	481	1192	600	259	949	639	396	1111	317	1498	759
Base Capacity (vph)	0	0	0	0	0	0	0	0	0	0	0
Stavation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.54	0.07	0.36	0.45	0.53	0.19	0.93	0.91	0.37	0.36

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
4: Dorval Road & Speers Road

Future Total AM (Interim)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	TT	TT	T	T	T	T	T	T	T	T	T
Traffic Volume (vph)	415	590	40	85	395	310	70	825	130	265	515
Future Volume (vph)	415	590	40	85	395	310	70	825	130	265	515
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Frb. ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	0.98
Flbb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	1.00	1.00	0.85
Satd. Flow (prot)	3400	3329	1482	1656	3256	1495	1785	3476	1687	3539	1417
Flt Permitted	0.95	1.00	1.00	0.33	1.00	1.00	0.44	1.00	0.10	1.00	1.00
Satd. Flow (perm)	3400	3329	1482	563	3256	1495	831	3476	169	3539	1417
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
Adj. Flow (vph)	451	641	43	92	429	337	76	897	141	288	560
RTOR Reduction (vph)	0	0	31	0	0	70	0	10	0	0	162
Lane Group Flow (vph)	451	641	12	92	429	267	76	1028	0	288	560
Confl. Peds. (#/hr)	5			5		5	5		5		5
Heavy Vehicles (%)	3%	8%	9%	9%	10%	7%	1%	2%	0%	7%	2%
Bus Blockages (#/hr)	0	2	0	0	4	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm-pt	NA	pm-pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6
Permitted Phases			4			8		2			6
Actuated Green, G (s)	17.0	33.3	33.3	24.8	43.0	44.2	38.0	44.2	38.0	60.2	50.0
Effective Green, g (s)	17.0	33.3	33.3	24.8	43.0	44.2	38.0	44.2	38.0	60.2	50.0
Actuated g/C Ratio	0.14	0.28	0.28	0.28	0.21	0.36	0.37	0.32	0.50	0.42	0.42
Clearance Time (s)	4.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	4.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	481	923	411	237	672	535	355	1100	315	1474	590
v/s Ratio Prot	c0.13	c0.19		0.03	0.13	0.08	0.01	0.30	c0.14	0.16	
v/s Ratio Perm			0.01	0.08	0.10	0.07			c0.32		0.08
v/c Ratio	0.94	0.69	0.03	0.39	0.64	0.50	0.21	0.93	0.91	0.38	0.20
Uniform Delay, d1	51.0	38.8	31.6	33.3	43.5	30.1	25.0	39.8	35.0	24.3	22.2
Progression Factor	1.00	1.00	1.00	0.70	0.77	0.47	1.00	1.00	1.01	0.38	0.96
Incremental Delay, d2	26.0	2.9	0.1	1.0	2.7	0.7	0.3	15.3	23.9	0.6	0.6
Delay (s)	76.9	41.7	31.6	24.2	36.1	14.7	25.3	55.1	59.5	9.7	12.9
Level of Service	E	D	C	C	D	B	C	E	E	A	B
Approach Delay (s)		55.3		26.4		53.1		23.2			C
Approach LOS		E		C		D		C			C

Intersection Summary		
HCM 2000 Control Delay	40.3	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.90	D
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	85.5%	ICU Level of Service
Analysis Period (min)	15	E
c Critical Lane Group		

Timings
5. St. Augustine Drive & Speers Road

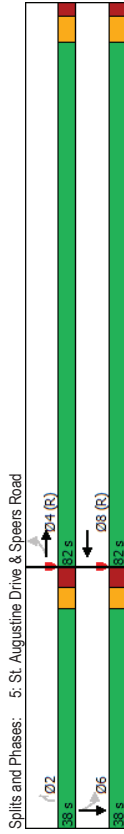
Queues
5. St. Augustine Drive & Speers Road

Future Total AM (Interim)
Upper Kerr Village (8/24-01)

Future Total AM (Interim)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	WBT	NBR	Ø6
Lane Configurations	5	4	4	2	Ø6
Traffic Volume (vph)	870	825	20	20	
Future Volume (vph)	870	825	20	20	
Turn Type	Perm	NA	NA	Perm	6
Protected Phases		4	8		
Permitted Phases	4	4	8	2	2
Detector Phase	4	4	8	2	
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.9	23.9	24.3	24.3	
Total Split (s)	82.0	82.0	38.0	38.0	
Total Split (%)	68.3%	68.3%	31.7%	32%	
Maximum Green (s)	76.1	76.1	31.7	31.7	
Yellow Time (s)	3.7	3.7	3.3	3.3	
All-Red Time (s)	2.2	2.2	3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9	5.9	5.9	6.3	
Lead/Lag					
Lead-Lag Optimize?					
Vehicle Extension (s)	3.0	3.0	3.0	3.0	
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	C-Min	C-Min	None	None	
Walk Time (s)	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0	0	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 51 (43%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated



Lane Group	EBL	EBT	WBT	NBR
Lane Group Flow (vph)	6	1006	955	23
v/c Ratio	0.01	0.32	0.31	0.11
Control Delay	1.6	1.4	4.8	1.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	1.6	1.4	4.8	1.1
Queue Length 50th (m)	0.2	15.8	61.5	0.0
Queue Length 95th (m)	m0.3	m19.8	55.9	0.0
Internal Link Dist (m)		472.1	42.5	
Turn Bay Length (m)	50.0			
Base Capacity (vph)	516	3124	3123	514
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	0.01	0.32	0.31	0.04

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 5. St. Augustine Drive & Speers Road

Future Total AM (Interim)
 Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	870	15	0	825	15	0	0	20	0	0	0
Traffic Volume (vph)	5	870	15	0	825	15	0	0	20	0	0	0
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
Total Lost time (s)	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00	1.00	1.00
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
Frbp. ped/bikes	1.00	1.00	1.00	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1797	3430	3427	1797	3430	3427	1797	3430	3427	1797	3430	3427
Flt Permitted	0.30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	566	3430	3427	566	3430	3427	566	3430	3427	566	3430	3427
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	6	989	17	0	938	17	0	0	23	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	22	0	0	0
Lane Group Flow (vph)	6	1006	0	0	955	0	0	0	1	0	0	0
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	0%	5%	0%	0%	5%	0%	0%	0%	5%	0%	0%	0%
Turn Type	Perm	NA	NA	NA	NA	NA	NA	NA	Perm	Perm	NA	NA
Protected Phases	4								8			6
Permitted Phases	4								2			6
Actuated Green, G (s)	104.5	104.5	104.5	104.5	104.5	104.5	104.5	104.5	3.3	3.3	3.3	3.3
Effective Green, g (s)	104.5	104.5	104.5	104.5	104.5	104.5	104.5	104.5	3.3	3.3	3.3	3.3
Actuated G/C Ratio	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.03	0.03	0.03	0.03
Clearance Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	6.3	6.3	6.3	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	492	2986	2984	492	2986	2984	492	2986	43	43	43	43
v/s Ratio Prot	c0.29								0.28			
v/s Ratio Perm	0.01								c0.00			
v/c Ratio	0.01	0.34	0.32	0.01	0.32	0.32	0.01	0.32	0.01	0.01	0.01	0.01
Uniform Delay, d1	1.0	1.4	1.4	1.0	1.4	1.4	1.0	1.4	56.8	56.8	56.8	56.8
Progression Factor	1.14	0.95	0.95	1.14	0.95	0.95	1.14	0.95	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	1.6	1.6	1.2	1.6	1.6	1.2	1.6	56.9	56.9	56.9	56.9
Level of Service	A	A	A	A	A	A	A	A	E	E	E	E
Approach Delay (s)	1.6	5.3	5.3	1.6	5.3	5.3	1.6	5.3	56.9	56.9	56.9	56.9
Approach LOS	A	A	A	A	A	A	A	A	E	E	E	E
Intersection Summary												
HCM 2000 Control Delay	4.0 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.33											
Actuated Cycle Length (s)	120.0 Sum of lost time (s)											
Intersection Capacity Utilization	38.9% ICU Level of Service											
Analysis Period (min)	15											
c Critical Lane Group												

Timings
 6. Speers Road/Cornwall Road & Cross Avenue

Future Total AM (Interim)
 Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	870	15	0	825	15	0	0	20	0	0	0
Traffic Volume (vph)	5	870	15	0	825	15	0	0	20	0	0	0
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Turn Type	pm-pt	NA	NA	NA	NA	NA	NA	NA	Prot	Perm	Perm	Perm
Protected Phases	5	2	2	6	4							
Permitted Phases	5	2	2	6	4							
Detector Phase	5	2	2	6	4							
Switch Phase	6.0	38.0	38.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Initial (s)	12.0	47.6	47.6	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8
Minimum Split (s)	35.0	109.0	74.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0
Total Split (%)	25.0%	77.9%	52.9%	22.1%	22.1%	22.1%	22.1%	22.1%	22.1%	22.1%	22.1%	22.1%
Maximum Green (s)	29.0	102.4	67.4	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
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)	6.0	6.6	6.6	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Lead/Lag	Lead	Lag	Lag									
Lead/Lag Optimize?	Yes	Yes	Yes									
Vehicle Extension (s)	3.5	5.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
Recall Mode	None	C-Min	C-Min	None	None	None	None	None	None	None	None	None
Walk Time (s)	10.0	10.0	10.0									
Flash Dont Walk (s)	31.0	31.0	31.0									
Pedestrian Calls (#/hr)	5	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												
Spits and Phases: 6: Speers Road/Cornwall Road & Cross Avenue												
→ Ø2 (R)	109.5											
← Ø5	74.5											
← Ø6 (R)	31.5											
← Ø4	31.5											

Queues
6: Speers Road/Cornwall Road & Cross Avenue

Future Total AM (Interim)
Upper Kerr Village (8/24-01)

	EBL	EBT	WBT	SBL	SBR
Lane Group	241	1447	748	6	288
Lane Group Flow (vph)	0.42	0.50	0.30	0.05	0.63
v/c Ratio	4.4	3.9	7.3	60.6	12.9
Control Delay	0.0	0.0	0.0	0.0	0.0
Queue Delay	4.4	3.9	7.3	60.6	12.9
Total Delay	9.4	45.2	33.8	1.6	0.0
Queue Length 50th (m)	14.5	54.0	44.0	5.7	11.7
Queue Length 95th (m)	474.4	77.5	60.0		
Internal Link Dist (m)	80.0		45.0		
Turn Bay Length (m)	723	2905	2501	324	705
Base Capacity (vph)	0	0	0	0	0
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	0.33	0.50	0.30	0.02	0.41
Intersection Summary					

HCM Signalized Intersection Capacity Analysis
6: Speers Road/Cornwall Road & Cross Avenue

Future Total AM (Interim)
Upper Kerr Village (8/24-01)

	EBL	EBT	WBT	SBL	SBR
Movement	EBL	EBT	WBT	SBL	SBR
Lane Configurations	TT	TT	TT	TT	TT
Traffic Volume (vph)	205	1230	615	20	5
Future Volume (vph)	205	1230	615	20	5
Ideal Flow (vphpb)	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
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00
Fibb. 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)	1686	3471	3450	1805	2608
Flt Permitted	0.33	1.00	1.00	0.95	1.00
Satd. Flow (perm)	591	3471	3450	1805	2608
Peak-Hour factor, PHF	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	241	1447	724	24	6
RTOR Reduction (vph)	0	0	1	0	0
Lane Group Flow (vph)	241	1447	747	0	6
Confl. Peds. (#/hr)	5		5		
Heavy Vehicles (%)	7%	4%	4%	5%	9%
Turn Type	pm>pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2			4	
Actuated Green, G (s)	117.2	117.2	101.5	10.4	10.4
Effective Green, g (s)	117.2	117.2	101.5	10.4	10.4
Actuated g/C Ratio	0.84	0.84	0.72	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)	570	2905	2501	134	193
v/s Ratio Prot	0.03	0.42	0.22	0.00	
v/c Ratio Perm	0.32			0.04	0.11
v/c Ratio	0.42	0.50	0.30	0.04	0.11
Uniform Delay, d1	2.8	3.2	6.8	60.2	60.5
Progression Factor	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.6	0.3	0.1	0.3
Delay (s)	3.4	3.8	7.1	60.3	60.7
Level of Service	A	A	A	E	E
Approach Delay (s)	3.7	7.1	60.7		
Approach LOS	A	A	E		
Intersection Summary					
HCM 2000 Control Delay		10.8		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio		0.49			
Actuated Cycle Length (s)		140.0		Sum of lost time (s)	18.4
Intersection Capacity Utilization		69.2%		ICU Level of Service	C
Analysis Period (min)		15			
c Critical Lane Group					

7: Kerr Street & Prince Charles Drive

8: Kerr Street & Elmwood Road

Future Total AM (Interim)

Future Total AM (Interim)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	0	5	0	40	5	555	5	40	400	5	5
Traffic Volume (veh/h)	5	0	5	0	40	5	555	5	40	400	5	5
Future Volume (Veh/h)	5	0	5	0	40	5	555	5	40	400	5	5
Sign Control	Stop	0%	Stop	0%	Free	0%	Free	0%	Free	0%	Free	0%
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	6	0	6	0	48	6	661	6	48	476	6	6
Pedestrians	15			30								
Lane Width (m)	3.6			3.6								
Walking Speed (m/s)	1.1			1.1								
Percent Blockage	1			3								
Right turn flare (veh)												
Median type							None					None
Median storage (veh)												
Upstream signal (m)							238					127
pX platoon unblocked	0.90	0.90	0.83	0.90	0.90	0.87	0.83			0.87		
VC, conflicting volume	1314	1299	494	1287	1289	694	497			697		
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	963	946	292	933	946	571	296			575		
IC, single (s)	7.1	6.5	6.5	7.1	6.5	6.3	4.3			4.2		
IC, 2 stage (s)												
p0 queue free %	3.5	4.0	3.6	3.5	4.0	3.4	2.3			2.3		
IF (s)	97	100	99	97	100	89	99			94		
CM capacity (veh/h)	172	213	568	198	213	427	978			822		
Direction_Lane #	EB 1	WB 1	NB 1	SB 1	EB 1	NB 1	SB 1					
Volume Total	12	54	673	530								
Volume Left	6	6	6	48								
Volume Right	6	48	6	6								
cSH	263	378	978	822								
Volume to Capacity	0.05	0.14	0.01	0.06								
Queue Length 95th (m)	1.1	3.8	0.1	1.4								
Control Delay (s)	19.3	16.1	0.2	1.6								
Lane LOS	C	C	A	A								
Approach Delay (s)	19.3	16.1	0.2	1.6								
Approach LOS	C	C	C	C								
Intersection Summary												
Average Delay	1.6											
Intersection Capacity Utilization	58.2%											
ICU Level of Service	B											
Analysis Period (min)	15											

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	20	10	5	535	370	30
Traffic Volume (veh/h)	20	10	5	535	370	30
Future Volume (Veh/h)	20	10	5	535	370	30
Sign Control	Stop	Free	Free	0%	0%	0%
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	24	12	6	629	435	35
Pedestrians	20			5		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	2			0		
Right turn flare (veh)						
Median type				None		None
Median storage (veh)						
Upstream signal (m)				103		262
pX platoon unblocked	0.90	0.90	0.90	0.90		
VC, conflicting volume	1114	478	490			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	825	368	381			
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
p0 queue free %	3.5	3.3	2.2			
IF (s)	92	98	99			
CM capacity (veh/h)	302	602	1053			
Direction_Lane #	EB 1	NB 1	SB 1			
Volume Total	36	635	470			
Volume Left	24	6	0			
Volume Right	12	0	35			
cSH	362	1053	1700			
Volume to Capacity	0.10	0.01	0.28			
Queue Length 95th (m)	2.5	0.1	0.0			
Control Delay (s)	16.0	0.2	0.0			
Lane LOS	C	A	A			
Approach Delay (s)	16.0	0.2	0.0			
Approach LOS	C	C	C			
Intersection Summary						
Average Delay	0.6					
Intersection Capacity Utilization	43.7%					
ICU Level of Service	A					
Analysis Period (min)	15					

Timings
9: Kerr Street & Stewart Street

Queues
9: Kerr Street & Stewart Street

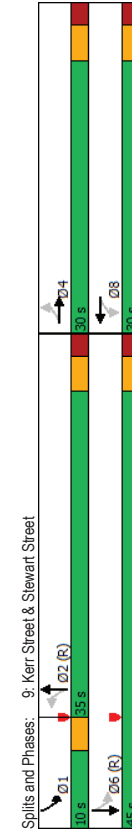
Future Total AM (Interim)
Upper Kerr Village (8/24-01)

Future Total AM (Interim)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	35	25	20	35	5	430	40
Future Volume (vph)	35	25	20	35	5	430	40
Turn Type	Perm	NA	Perm	NA	Perm	NA	prn+pt
Protected Phases	4		8		2		6
Permitted Phases	4	4	8	8	2	2	1
Detector Phase							
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	24.0	24.0	6.0
Minimum Split (s)	30.0	30.0	30.0	30.0	32.0	32.0	10.0
Total Split (s)	30.0	30.0	30.0	30.0	35.0	35.0	10.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	46.7%	46.7%	13.3%
Maximum Green (s)	24.6	24.6	24.6	24.6	29.6	29.6	7.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.0
All-Red Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.4	5.4	5.4	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
Minimum Gap (s)	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
Time To Reduce (s)	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
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

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	79	152	554	452
v/c Ratio	0.28	0.40	0.48	0.44
Control Delay	23.8	14.2	9.8	9.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.8	14.2	9.8	9.3
Queue Length 50th (m)	9.6	8.7	25.4	19.5
Queue Length 95th (m)	15.4	16.8	63.5	51.2
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)				
Base Capacity (vph)	459	559	1156	1032
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	0.17	0.27	0.48	0.44

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



9: Kerr Street & Stewart Street

Future Total AM (Interim)

Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	35	25	5	20	35	70	5	430	20	40	300	30
Traffic Volume (vph)	35	25	5	20	35	70	5	430	20	40	300	30
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Frt	0.97	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	1701	1612	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775
Satd. Flow (prot)	0.79	0.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Permitted	1388	1532	1769	1769	1769	1769	1769	1769	1769	1769	1769	1769
Satd. Flow (perm)	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Peak-hour factor, PHF	43	30	6	24	43	85	6	524	24	49	366	37
Adj. Flow (vph)	0	5	0	0	68	0	0	1	0	0	3	0
RTOR Reduction (vph)	0	74	0	0	84	0	0	553	0	0	449	0
Lane Group Flow (vph)	20	20	20	20	20	30	35	35	35	35	30	30
Confl. Peds. (#/hr)	2%	7%	16%	0%	5%	4%	28%	6%	0%	2%	6%	6%
Heavy Vehicles (%)	0	2	0	0	2	0	0	0	0	0	0	4
Bus Blockages (#/hr)	Perm	NA	NA	Perm	NA	Perm	NA	NA	pm-pt	NA	NA	NA
Turn Type	4	8	2	8	2	2	1	6	1	6	6	6
Protected Phases	15.2	15.2	15.2	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0
Actuated Green, G (s)	0.20	0.20	0.20	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Effective Green, g (s)	4.0	4.0	4.0	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Actuated G/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Clearance Time (s)	281	310	1155	c0.31	0.28	0.48	0.44	6.3	6.3	6.3	6.3	6.3
Vehicle Extension (s)	0.05	0.26	0.27	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2
v/s Ratio Prot	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
v/s Ratio Perm	0.7	0.6	0.6	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
v/c Ratio	25.9	25.9	25.9	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Uniform Delay, d1	C	C	C	A	A	A	A	A	A	A	A	A
Progression Factor	25.9	25.9	25.9	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Incremental Delay, d2	C	C	C	A	A	A	A	A	A	A	A	A
Delay (s)	C	C	C	A	A	A	A	A	A	A	A	A
Level of Service	C	C	C	A	A	A	A	A	A	A	A	A
Approach Delay (s)	C	C	C	A	A	A	A	A	A	A	A	A
Approach LOS	C	C	C	A	A	A	A	A	A	A	A	A
Intersection Summary	HCM 2000 Control Delay: 10.8 HCM 2000 Level of Service: B HCM 2000 Volume to Capacity ratio: 0.45 Actuated Cycle Length (s): 75.0 Sum of lost time (s): 13.8 Intersection Capacity Utilization: 67.1% ICU Level of Service: C Analysis Period (min): 15 Critical Lane Group:											

10: Donval Road & Wyecroft Road

Future Total AM (Interim)

Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	17	4	3	8	2	2	2	1	6	1	6	6
Traffic Volume (vph)	215	120	20	130	110	1345	155	995	155	995	995	995
Future Volume (vph)	215	120	20	130	110	1345	155	995	155	995	995	995
Turn Type	Prot	NA	pm-pt	NA	pm-pt	NA	Prot	NA	Prot	NA	6	6
Protected Phases	7	4	3	8	2	2	2	1	6	1	6	6
Detector Phase	7	4	3	8	2	2	2	1	6	1	6	6
Switch Phase	7.0	10.0	7.0	10.0	7.0	20.0	7.0	20.0	7.0	20.0	7.0	20.0
Minimum Initial (s)	12.0	25.0	12.0	25.0	12.0	41.0	12.0	41.0	12.0	41.0	12.0	41.0
Minimum Split (s)	21.0	40.0	21.0	40.0	17.0	42.0	17.0	42.0	17.0	42.0	17.0	42.0
Total Split (%)	17.5%	33.3%	17.5%	33.3%	14.2%	35.0%	14.2%	35.0%	14.2%	35.0%	14.2%	35.0%
Maximum Green (s)	16.0	33.0	16.0	33.0	12.0	35.0	12.0	35.0	12.0	35.0	12.0	35.0
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	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)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
Recall Mode	None	None	None	None	None	None	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	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	27.0	11.0	27.0	11.0	27.0	11.0	27.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Intersection Summary	Cycle Length: 120 Actuated Cycle Length: 120 Offset: 118 (98%), Referenced to phase 2:NETL and 6:SBT, Start of Green Natural Cycle: 90 Control Type: Actuated-Coordinated											
Splits and Phases	10: Donval Road & Wyecroft Road Ø1 17 s Ø2 (R) 42 s Ø3 21 s Ø4 40 s Ø5 17 s Ø6 (R) 42 s Ø7 21 s Ø8 40 s											

Queues
10: Dorval Road & Wynecroft Road

Future Total AM (Interim)
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	234	244	22	402	120	1527	168	1560
v/c Ratio	0.60	0.30	0.08	0.68	0.54	0.68	0.45	0.72
Control Delay	56.6	20.8	27.9	26.0	26.8	17.8	53.6	28.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.6	20.8	27.9	26.0	26.8	17.8	53.6	28.3
Queue Length 50th (m)	27.0	11.8	3.6	19.5	7.9	96.4	19.4	100.5
Queue Length 95th (m)	40.0	24.6	8.9	34.2	m13.5	m143.8	29.5	140.1
Internal Link Dist (m)	155.6		145.0	199.3	494.4			672.1
Turn Bay Length (m)	115.0				65.0		125.0	
Base Capacity (vph)	416	938	363	1031	239	2236	386	2178
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.26	0.06	0.39	0.50	0.68	0.44	0.72
Intersection Summary								
m Volume for 95th percentile queue is metered by upstream signal.								

HCM Signalized Intersection Capacity Analysis
10: Dorval Road & Wynecroft Road

Future Total AM (Interim)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	TT	TT	T	T	TT	TT	TT	TT	TT
Traffic Volume (vph)	215	120	105	20	130	240	110	1345	60
Future Volume (vph)	215	120	105	20	130	240	110	1345	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0
Lane Util. Factor	0.97	0.95	1.00	0.95	1.00	0.91	1.00	0.97	0.91
Fpb. ped/bikes	1.00	0.99	1.00	0.99	1.00	0.99	1.00	1.00	1.00
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.93	1.00	0.90	1.00	0.99	1.00	0.95	1.00
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	3127	3072	1637	3129	1641	5035	3433	4667	3433
Flt Permitted	0.95	1.00	0.60	1.00	0.08	1.00	0.95	1.00	0.95
Satd. Flow (perm)	3127	3072	1034	3129	140	5035	3433	4667	3433
Peak-Hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	234	130	114	22	141	261	120	1462	65
RTOR Reduction (vph)	0	87	0	0	200	0	0	3	0
Lane Group Flow (vph)	234	157	0	22	202	0	120	1524	0
Confl. Peds. (#/hr)	2	3	3	3	2	1			1
Heavy Vehicles (%)	12%	7%	9%	10%	5%	2%	10%	2%	1%
Bus Blockages (#/hr)	0	2	0	0	0	0	3	0	0
Turn Type	Prot	NA	NA	pm-pt	NA	pm-pt	NA	Prot	NA
Protected Phases	7	4	3	8	5	2	1	6	6
Permitted Phases			8		2				
Actuated Green, G (s)	14.9	28.9	21.8	17.9	61.7	50.1	13.1	51.6	13.1
Effective Green, g (s)	14.9	28.9	21.8	17.9	61.7	50.1	13.1	51.6	13.1
Actuated g/C Ratio	0.12	0.24	0.18	0.15	0.51	0.42	0.11	0.43	0.11
Clearance Time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	388	739	207	466	217	2102	374	2006	374
v/s Ratio Prot	c0.07	0.05	0.00	c0.06	c0.05	0.30	0.05	c0.32	0.05
v/s Ratio Perm			0.02		0.23				
v/c Ratio	0.60	0.21	0.11	0.43	0.55	0.72	0.45	0.75	0.45
Uniform Delay, d1	49.8	36.5	40.7	46.4	19.4	23.2	50.1	28.8	50.1
Progression Factor	1.00	1.00	1.00	1.00	1.21	0.60	1.00	1.00	1.00
Incremental Delay, d2	3.9	0.3	0.5	1.4	2.5	1.1	1.8	2.6	1.8
Delay (s)	53.6	36.8	41.2	47.8	26.1	18.7	51.9	31.4	51.9
Level of Service	D	D	D	D	C	B	D	C	D
Approach Delay (s)		45.0		47.4		19.2		33.4	
Approach LOS		D		D		B		C	
Intersection Summary									
HCM 2000 Control Delay	30.6			HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio	0.64								
Actuated Cycle Length (s)	120.0								
Sum of lost time (s)	24.0								
Intersection Capacity Utilization	73.0%								
ICU Level of Service	D								
Analysis Period (min)	15								
Critical Lane Group	c								

HCM Unsignalized Intersection Capacity Analysis
 11: Speers Road & Interim Connection

Future Total AM (Interim)
 Upper Kerr Village (8/24-01)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔↔	↔↔	↔↔	↔↔	↔↔	↔↔
Traffic Volume (veh/h)	0	890	725	15	0	115
Future Volume (Veh/h)	0	890	725	15	0	115
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	967	788	16	0	125
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None	None		
Median storage (veh)		66	169			
Upstream signal (m)						
pX, platoon unblocked	0.87			0.89	0.87	
VC, conflicting volume	804			1280	402	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	475			825	13	
IC, single (s)	4.1			6.8	6.9	
IC, 2 stage (s)						
IF (s)	2.2			3.5	3.3	
p0 queue free %	100			100	86	
CM capacity (veh/h)	942			278	925	
Direction_Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	484	484	525	279	125	
Volume Left	0	0	0	0	0	
Volume Right	0	0	0	16	125	
cSH	1700	1700	1700	1700	925	
Volume to Capacity	0.28	0.28	0.31	0.16	0.14	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	3.5	
Control Delay (s)	0.0	0.0	0.0	0.0	9.5	
Lane LOS	A	A	A	A	A	
Approach Delay (s)	0.0	0.0	0.0	9.5		
Approach LOS				A		
Intersection Summary						
Average Delay	0.6					
Intersection Capacity Utilization	34.3%					
ICU Level of Service	A					
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
 11: Kerr Street & Wycroft Road

Future Total PM (Interim)
 Upper Kerr Village (8/24-01)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔	↔↔	↔↔	↔↔	↔↔	↔↔
Traffic Volume (veh/h)	25	145	125	670	545	110
Future Volume (Veh/h)	25	145	125	670	545	110
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	27	156	134	720	586	118
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None	None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
VC, conflicting volume	1278	357	709			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	1278	357	709			
IC, single (s)	6.8	7.0	4.2			
IC, 2 stage (s)						
IF (s)	3.5	3.3	2.3			
p0 queue free %	80	75	84			
CM capacity (veh/h)	135	631	856			
Direction_Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	27	156	134	360	360	391 313
Volume Left	27	0	134	0	0	0 0
Volume Right	0	156	0	0	0	0 118
cSH	135	631	856	1700	1700	1700 1700
Volume to Capacity	0.20	0.25	0.16	0.21	0.21	0.23 0.18
Queue Length 95th (m)	5.4	7.4	4.2	0.0	0.0	0.0 0.0
Control Delay (s)	38.2	12.6	10.0	0.0	0.0	0.0 0.0
Lane LOS	E	B	A	A	A	A A
Approach Delay (s)	16.4		1.6			0.0
Approach LOS	C					
Intersection Summary						
Average Delay	2.5					
Intersection Capacity Utilization	38.9%					
ICU Level of Service	A					
Analysis Period (min)	15					

Timings 2: Kerr Street & Shepherd Road

Queues 2: Kerr Street & Shepherd Road

Future Total PM (Interim) Upper Kerr Village (8/24-01)

Future Total PM (Interim) Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	35	5	95	10	120	565	105	155	450	50
Traffic Volume (vph)	35	5	95	10	120	565	105	155	450	50
Future Volume (vph)	Perm	NA	Perm	NA	Perm	NA	Perm	pm+pt	NA	Perm
Turn Type	4	8	8	2	2	2	2	1	6	6
Protected Phases	4	8	8	2	2	2	2	1	6	6
Permitted Phases	4	8	8	2	2	2	2	1	6	6
Detector Phase	4	8	8	2	2	2	2	1	6	6
Switch Phase	4	8	8	2	2	2	2	1	6	6
Minimum Initial (s)	5.0	5.0	5.0	5.0	18.0	18.0	18.0	7.0	18.0	18.0
Minimum Split (s)	22.0	22.0	22.0	22.0	28.2	28.2	28.2	11.0	28.2	28.2
Total Split (s)	33.0	33.0	33.0	33.0	53.0	53.0	53.0	22.0	75.0	75.0
Total Split (%)	30.6%	30.6%	30.6%	30.6%	49.1%	49.1%	49.1%	20.4%	69.4%	69.4%
Maximum Green (s)	29.0	29.0	29.0	29.0	47.8	47.8	47.8	16.0	69.8	69.8
Yellow Time (s)	3.0	3.0	3.0	3.0	3.3	3.3	3.3	4.0	3.3	3.3
All-Red Time (s)	1.0	1.0	1.0	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	4.0	4.0	5.2	5.2	5.2	4.0	5.2	5.2
Lead/Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	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
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	None	None	None	Min	Min	Min	None	Min	Min
Walk Time (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	13.0	13.0	13.0	13.0	13.0	13.0
Pedestrian Calls (#/hr)	0	0	0	0	5	5	5	5	5	5

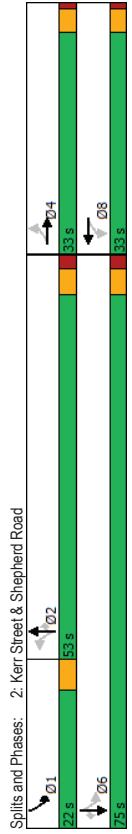
Intersection Summary

Cycle Length: 108

Actuated Cycle Length: 49.4

Natural Cycle: 65

Control Type: Semi Act-Uncoord



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	38	38	98	160	130	582	108	160	464	54
v/c Ratio	0.17	0.11	0.40	0.38	0.37	0.42	0.16	0.27	0.21	0.05
Control Delay	19.1	9.2	23.1	7.7	15.6	12.7	3.7	5.1	4.6	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.1	9.2	23.1	7.7	15.6	12.7	3.7	5.1	4.6	1.7
Queue Length 50th (m)	2.7	0.3	7.2	0.8	7.5	17.9	0.0	4.1	7.2	0.0
Queue Length 95th (m)	9.7	6.4	20.2	13.0	21.8	34.6	7.5	11.5	15.4	3.0
Internal Link Dist (m)	110.5		241.3		50.0	143.2		50.0	21.4	
Turn Bay Length (m)	725	976	781	1002	860	3372	1466	844	3574	1583
Base Capacity (vph)	0	0	0	0	0	0	0	0	0	0
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	0.05	0.04	0.13	0.16	0.15	0.17	0.07	0.19	0.13	0.03

Intersection Summary

2: Kerr Street & Shepherd Road

Future Total PM (Interim)

Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	35	5	30	95	10	145	120	565	105	155	450	50
Traffic Volume (vph)	35	5	30	95	10	145	120	565	105	155	450	50
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpt)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total Lost Time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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
Frbp_psd/bikes	1.00	1.00	1.00	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1620	1732	1593	1770	1593	1543	1804	3574	1583	1583	1583
Flt Permitted	0.68	1.00	0.73	1.00	0.49	1.00	1.00	0.34	1.00	1.00	1.00	1.00
Satd. Flow (perm)	1221	1620	1335	1593	904	3539	1543	645	3574	1583	1583	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.97	0.92	0.97	0.97	0.97	0.97	0.97	0.97	0.92
Adj. Flow (vph)	38	5	33	98	11	149	130	582	108	160	464	54
RTOR Reduction (vph)	0	27	0	0	121	0	0	0	66	0	0	20
Lane Group Flow (vph)	38	11	0	98	39	0	130	582	42	160	464	34
Confl. Peds. (#/hr)	2%	2%	2%	3%	2%	1%	2%	1%	2%	0%	1%	2%
Heavy Vehicles (%)	0	0	0	0	0	0	0	5	0	0	0	0
Bus Blockages (#/hr)	0	0	0	0	0	0	0	5	0	0	0	0
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	4			8			2			1		6
Permitted Phases	4			8			2			2		6
Actuated Green, G (s)	9.3	9.3	9.3	9.3	9.3	19.1	19.1	19.1	19.1	30.7	30.7	30.7
Effective Green, g (s)	9.3	9.3	9.3	9.3	9.3	19.1	19.1	19.1	19.1	30.7	30.7	30.7
Actuated G/C Ratio	0.19	0.19	0.19	0.19	0.19	0.39	0.39	0.39	0.39	0.62	0.62	0.62
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	5.2	5.2	5.2	5.2	4.0	5.2	5.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.5	3.5	3.5	3.5	2.5	3.5	3.5
Lane Grp Cap. (vph)	230	306	252	301	301	350	1373	599	581	2230	987	987
v/s Ratio Prot	0.01			0.02			c0.16			c0.04	0.13	
v/s Ratio Perm	0.03			c0.07			0.14			0.03	0.13	
v/c Ratio	0.17	0.04	0.39	0.13	0.39	0.13	0.37	0.42	0.07	0.28	0.21	0.03
Uniform Delay, d1	16.7	16.3	17.5	16.6	16.6	10.8	11.0	9.5	4.1	4.0	3.6	
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	0.3	0.0	1.0	0.2	0.8	0.3	0.1	0.2	0.1	0.1	0.0	
Delay (s)	17.0	16.3	18.5	16.8	16.8	11.5	11.3	9.5	4.3	4.1	3.6	
Level of Service	B	B	B	B	B	B	B	A	A	A	A	A
Approach Delay (s)	16.7	B	B	17.4	B	B	11.1	B	B	4.1	A	
Approach LOS	B			B			B			A		
Intersection Summary												
HCM 2000 Control Delay	9.6 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.39											
Actuated Cycle Length (s)	49.2 Sum of lost time (s)											
Intersection Capacity Utilization	60.3% ICU Level of Service											
Analysis Period (min)	15											
c Critical Lane Group												

3: Kerr Street & Speers Road

Future Total PM (Interim)

Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	160	565	130	300	905	495	140	180	235	300	260	50
Traffic Volume (vph)	160	565	130	300	905	495	140	180	235	300	260	50
Future Volume (vph)	160	565	130	300	905	495	140	180	235	300	260	50
Turn Type	pm-pt	NA	Perm	pm-pt	NA	Perm	pm-pt	7	4	3	8	
Protected Phases	6			6			2			4		8
Permitted Phases	6			6			2			4		8
Detector Phase	1	6	6	5	2	2	7	4	4	3	8	8
Switch Phase	1	6	6	5	2	2	7	4	4	3	8	8
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	16.0	38.0	38.0	16.0	38.0	38.0
Total Split (%)	10.0%	45.0%	45.0%	10.0%	45.0%	45.0%	13.3%	31.7%	31.7%	13.3%	31.7%	31.7%
Maximum Green (s)	9.0	48.1	48.1	9.0	48.1	48.1	13.0	31.7	31.7	13.0	31.7	31.7
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	2.2	2.2	0.0	2.2	2.2
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
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
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	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	14.0	14.0
Pedestrian Calls (#/hr)	15	15	15	15	15	15	15	35	35	15	35	35
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 49 (41%), Referenced to phase 2\WBT\ and 6\EBTL, Start of Green												
Natural Cycle: 90												
Control Type: Actuated-Coordinated												
Spits and Phases: 3: Kerr Street & Speers Road												
Ø1	Ø2 (R)	Ø3	Ø4	Ø5	Ø6 (R)	Ø7	Ø8					
17.5 s	54.5 s	16.5 s	38.5 s	17.5 s	54.5 s	16.5 s	38.5 s					

Queues
3: Kerr Street & Speers Road

Future Total PM (Interim)
Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	188	595	137	316	953	521	147	189	247	316	274	53
Lane Group Flow (vph)	0.50	0.37	0.18	0.63	0.56	0.54	0.50	0.56	0.53	0.83	0.74	0.15
v/c Ratio	14.3	21.9	10.0	20.5	25.2	4.9	33.0	50.2	8.9	71.7	57.7	3.8
Control 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
Queue Delay	14.3	21.9	10.0	20.5	25.2	4.9	33.0	50.2	8.9	71.7	57.7	3.8
Total Delay	22.0	51.1	9.2	33.9	83.0	3.1	24.5	40.7	0.0	38.2	61.4	0.0
Queue Length 50th (m)	38.2	76.1	21.2	#62.0	118.1	28.2	35.8	58.6	19.7	#60.6	84.1	4.7
Queue Length 95th (m)	138.4			474.4			103.4				143.2	
Internal Link Dist (m)	105.0		75.0	75.0	100.0	50.0		45.0	80.0		75.0	
Turn Bay Length (m)	347	1587	780	502	1704	972	319	495	574	384	501	456
Base Capacity (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Stavation 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	0.37	0.18	0.63	0.56	0.54	0.46	0.38	0.43	0.82	0.55	0.12

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
3: Kerr Street & Speers Road

Future Total PM (Interim)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	1	1	1	1	1	1	1	1	1	1	1	1
Traffic Volume (vph)	160	565	130	300	905	495	140	180	235	300	260	50
Future Volume (vph)	160	565	130	300	905	495	140	180	235	300	260	50
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	0.93	1.00	1.00	0.93
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
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Flt Protected	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Satd. Flow (prot)	1802	3511	1560	1750	3539	1485	1770	1877	1486	3467	1900	1501
Flt Permitted	0.22	1.00	1.00	0.35	1.00	1.00	0.33	1.00	1.00	0.85	1.00	1.00
Satd. Flow (perm)	416	3511	1560	636	3539	1485	624	1877	1486	3467	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	595	137	316	953	521	147	189	247	316	274	53
RTOR Reduction (vph)	0	0	75	0	0	268	0	0	203	0	0	43
Lane Group Flow (vph)	168	595	62	316	953	263	147	189	44	316	274	10
Confl. Peds. (#/hr)	30	5	5	5	5	30	35	35	35	35	35	35
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Bus Blockages (#/hr)	0	4	0	0	0	0	0	3	0	0	0	0
Turn Type	pm-pt	NA	pm-pt	NA	pm-pt	NA	pm-pt	NA	pm-pt	NA	pm-pt	NA
Protected Phases	1	6	5	2	2	7	4	4	3	8	8	8
Permitted Phases	6	6	2	2	2	4	4	4	4	4	4	4
Actuated Green, G (s)	63.6	54.2	70.1	57.7	57.7	33.0	21.6	21.6	13.1	23.3	23.3	23.3
Effective Green, g (s)	63.6	54.2	54.2	70.1	57.7	33.0	21.6	21.6	13.1	23.3	23.3	23.3
Actuated g/C Ratio	0.53	0.45	0.45	0.58	0.48	0.48	0.28	0.18	0.11	0.19	0.19	0.19
Clearance Time (s)	3.0	5.9	5.9	3.0	5.9	3.0	6.3	6.3	3.0	6.3	6.3	6.3
Vehicle Extension (s)	2.5	5.5	5.5	2.5	5.5	2.5	4.0	4.0	2.5	4.0	4.0	4.0
Lane Grp Cap (vph)	329	1585	704	491	1701	714	280	337	267	378	368	291
v/s Ratio Prot	0.04	0.17	0.04	0.07	0.27	0.05	0.10	0.05	0.10	0.09	0.14	0.01
v/s Ratio Perm	0.23	0.04	0.31	0.18	0.18	0.18	0.03	0.03	0.03	0.03	0.03	0.01
v/c Ratio	0.51	0.38	0.09	0.64	0.56	0.37	0.53	0.56	0.17	0.84	0.74	0.04
Uniform Delay, d1	15.9	21.7	18.8	13.5	22.1	19.7	34.8	44.9	41.6	52.4	45.5	39.2
Progression Factor	0.78	0.92	2.48	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.7	0.2	2.6	1.3	1.5	1.4	2.6	0.4	14.5	8.4	0.1
Delay (s)	13.4	20.6	46.7	16.1	23.5	21.1	36.2	47.5	42.0	66.9	54.0	39.3
Level of Service	B	C	D	B	C	C	D	D	D	E	D	D
Approach Delay (s)	23.2			21.5			42.3			59.1		
Approach LOS	C			C			D			E		

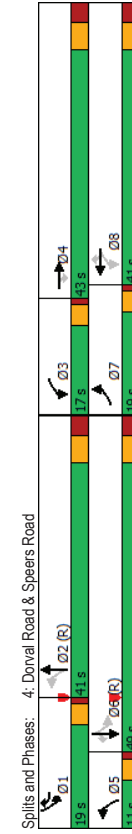
Intersection Summary	HCM 2000 Level of Service			HCM 2000 Volume to Capacity ratio			Sum of lost time (s)			ICU Level of Service		
HCM 2000 Control Delay	31.2			0.71			18.2			D		
HCM 2000 Volume to Capacity ratio	0.71			18.2			D					
Actuated Cycle Length (s)	120.0			15								
Intersection Capacity Utilization	78.4%											
Analysis Period (min)	15											
Critical Lane Group	C			C			D			E		

Timings 4: Dorval Road & Speers Road

Future Total PM (Interim) Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	415	520	50	175	690	490	65	615	280	685	375
Future Volume (vph)	415	520	50	175	690	490	65	615	280	685	375
Turn Type	Prot	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8	8	1	5	2	1	6
Permitted Phases	7	4	4	3	8	8	2	5	2	1	6
Detector Phase											
Switch Phase											
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	42.0	42.0	11.0	42.0	11.0	11.0	40.0	11.0	40.0	40.0
Total Split (s)	19.0	43.0	43.0	17.0	41.0	19.0	11.0	41.0	19.0	49.0	49.0
Total Split (%)	15.8%	35.8%	35.8%	14.2%	34.2%	15.8%	9.2%	34.2%	15.8%	40.8%	40.8%
Maximum Green (s)	15.0	36.0	36.0	13.0	34.0	15.0	7.0	34.0	15.0	42.0	42.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	3.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	1.0	1.0	3.0	1.0	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
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0
Minimum Gap (s)	3.0	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	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	0.0
Recall Mode	None	None	None	None	None	None	None	None	None	None	C-Min
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	28.0	28.0	28.0	28.0	28.0	28.0	26.0	26.0	26.0	26.0	26.0
Pedestrian Calls (#/hr)	5	5	5	5	5	5	5	5	5	5	5

Intersection Summary
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 17 (14%), Referenced to phase 2:NBLT and 6:SBTL, Start of Green
 Natural Cycle: 115
 Control Type: Actuated-Coordinated



Queues 4: Dorval Road & Speers Road

Future Total PM (Interim) Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	451	565	54	190	750	533	71	755	304	745	408
v/c Ratio	0.91	0.51	0.09	0.49	0.80	0.75	0.25	0.78	0.92	0.57	0.50
Control Delay	74.5	36.1	0.3	32.3	55.0	24.8	20.8	46.1	65.3	16.0	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.5	36.1	0.3	32.3	55.0	24.8	20.8	46.1	65.3	16.0	2.6
Queue Length 50th (m)	-59.7	58.2	0.0	28.9	75.5	40.1	9.1	84.0	31.9	58.3	4.7
Queue Length 95th (m)	#91.8	75.5	0.0	54.4	108.2	81.4	17.4	106.5	#105.1	28.6	1.1
Internal Link Dist (m)		412.3		472.1			621.6		494.4		
Turn Bay Length (m)			60.0	85.0		55.0	70.0		110.0		
Base Capacity (vph)		496	1110	585	405	1004	712	288	1003	330	1306
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		0.91	0.51	0.09	0.47	0.75	0.25	0.75	0.92	0.57	0.50

Intersection Summary
 ~ Volume exceeds capacity, queue is theoretically infinite.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 Queue shown is maximum after two cycles.

Future Total PM (Interim)
Upper Kerr Village (8/24-01)

Future Total PM (Interim)
Upper Kerr Village (8/24-01)

HCM Signalized Intersection Capacity Analysis
4: Dorval Road & Speers Road

5: St. Augustine Drive & Speers Road

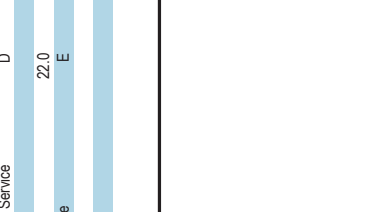
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↔↔	↔	↔↔	↔↔	↔	↔↔	↔↔	↔	↔	↔	↔
Traffic Volume (vph)	415	520	50	175	690	490	65	615	80	280	685	375
Future Volume (vph)	415	520	50	175	690	490	65	615	80	280	685	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	4.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3560	1556	1786	3546	1581	1805	3512	1787	3574	1599	1599
Flt Permitted	0.95	1.00	1.00	0.99	1.00	1.00	1.00	0.92	1.00	0.15	1.00	1.00
Satd. Flow (perm)	3433	3560	1556	1727	3546	1581	1805	3512	1787	3574	1599	1599
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)	451	565	54	190	750	533	71	668	87	304	745	408
RTOR Reduction (vph)	0	0	37	0	0	44	0	9	0	0	0	232
Lane Group Flow (vph)	451	565	17	190	750	489	71	746	0	304	745	176
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	0%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	2	0	0	4	0	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm-pt	NA	pm-pt	NA	Perm	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8		2		6		6
Actuated Green, G (s)	17.4	37.4	37.4	43.8	31.9	47.9	38.3	32.7	52.7	43.1	43.1	43.1
Effective Green, g (s)	17.4	37.4	37.4	43.8	31.9	47.9	38.3	32.7	52.7	43.1	43.1	43.1
Actuated G/C Ratio	0.14	0.31	0.31	0.36	0.27	0.40	0.32	0.27	0.44	0.36	0.36	0.36
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	4.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	3.0	5.0
Lane Grp Cap. (vph)	497	1109	484	370	942	631	251	957	323	1283	574	574
v/s Ratio Prot	c0.13	0.16		0.05	c0.21	0.10	0.01	0.21	c0.13	0.21		
v/s Ratio Perm			0.01	0.14		0.21	0.08		c0.29		0.11	
v/s Ratio	0.91	0.51	0.03	0.51	0.80	0.78	0.28	0.78	0.94	0.58	0.31	0.31
Uniform Delay, d1	50.5	33.8	28.7	27.2	41.0	31.4	29.0	40.3	28.2	31.1	27.7	27.7
Progression Factor	1.00	1.00	1.00	1.42	1.18	0.79	1.00	1.00	1.51	0.46	0.16	0.16
Incremental Delay, d2	20.1	0.8	0.1	1.2	5.3	5.8	0.6	6.3	30.2	1.5	1.1	1.1
Delay (s)	70.6	34.6	28.8	39.7	53.7	30.5	29.6	46.6	72.9	16.0	5.7	5.7
Level of Service	E	C	C	D	D	C	C	D	E	B	A	A
Approach Delay (s)												25.0
Approach LOS												C

Intersection Summary	
HCM 2000 Control Delay	39.5
HCM 2000 Volume to Capacity ratio	0.91
Actuated Cycle Length (s)	120.0
Sum of lost time (s)	22.0
Intersection Capacity Utilization	85.9%
Analysis Period (min)	15
ICU Level of Service	E
Critical Lane Group	

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BA Group - EFS
Synchro 11 Report
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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↔↔	↔	↔↔	↔↔	↔	↔↔	↔↔	↔	↔	↔	↔
Traffic Volume (vph)	10	845	1115	10	845	1115	25	5	0	0	0	0
Future Volume (vph)	10	845	1115	10	845	1115	25	5	0	0	0	0
Turn Type	Perm	NA	NA	Perm	Perm	Perm	NA	Perm	NA	Perm	NA	NA
Protected Phases	4			4			8			6		6
Permitted Phases	4			4			8			6		6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.9	23.9	23.9	24.3	24.3	24.3	24.3	24.3	27.0	27.0	27.0	27.0
Total Split (s)	93.0	93.0	93.0	93.0	93.0	93.0	93.0	93.0	27.0	27.0	27.0	27.0
Total Split (%)	77.5%	77.5%	77.5%	77.5%	77.5%	77.5%	77.5%	77.5%	22.5%	22.5%	22.5%	22.5%
Maximum Green (s)	87.1	87.1	87.1	87.1	87.1	87.1	87.1	87.1	20.7	20.7	20.7	20.7
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	3.0	3.0	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)	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	6.3	6.3	6.3	6.3
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 27 (23%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 35
Control Type: Actuated-Coordinated



Splits and Phases: 5: St. Augustine Drive & Speers Road
06L (L)
27.5 s
06R (R)
27.5 s

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BA Group - EFS
Synchro 11 Report
Page 11

Queues
5. St. Augustine Drive & Speers Road

Future Total PM (Interim)
Upper Kerr Village (8/24-01)

	EBL	EBT	WBT	NBR	SBL	SBT
Lane Group	EBL	EBT	WBT	NBR	SBL	SBT
Lane Group Flow (vph)	10	906	1171	26	5	10
v/c Ratio	0.02	0.28	0.36	0.09	0.06	0.05
Control Delay	1.1	1.1	1.7	0.6	55.4	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.1	1.1	1.7	0.6	55.4	0.5
Queue Length 50th (m)	0.2	12.9	2.1	0.0	1.2	0.0
Queue Length 95th (m)	m0.2	m9.3	2.4	0.0	5.3	0.0
Internal Link Dist (m)	472.1	49.4				93.6
Turn Bay Length (m)	50.0					
Base Capacity (vph)	405	3225	3240	465	311	386
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 v/c Ratio	0.02	0.28	0.36	0.06	0.02	0.03
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

HCM Signalized Intersection Capacity Analysis
5. St. Augustine Drive & Speers Road

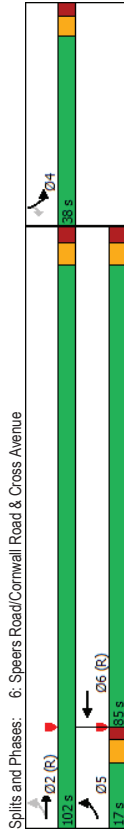
Future Total PM (Interim)
Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑↑	↑↑	↑↑	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	10	845	25	0	1115	10	0	0	25	5	0	10
Future Volume (vph)	10	845	25	0	1115	10	0	0	25	5	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95
Satd. Flow (prot)	1799	3552	3569	3569	3569	3569	3569	3569	1644	1805	1615	1615
Flt Permitted	0.24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95
Satd. Flow (perm)	447	3552	3569	3569	3569	3569	3569	3569	1644	1805	1615	1615
Peak-Hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	10	880	26	0	1161	10	0	0	26	5	0	10
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	25	0	0	10
Lane Group Flow (vph)	10	905	0	0	1171	0	0	0	1	5	0	0
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	0%	1%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	NA	NA	NA	NA	NA	NA	Perm	Perm	NA	NA
Protected Phases		4			8						6	
Permitted Phases		4			8						6	
Actuated Green, G (s)	104.0	104.0			104.0				3.8	3.8	3.8	
Effective Green, g (s)	104.0	104.0			104.0				3.8	3.8	3.8	
Actuated g/C Ratio	0.87	0.87			0.87				0.03	0.03	0.03	
Clearance Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	6.3	6.3	6.3	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	387	3078			3093				52	57	51	
v/s Ratio Prot		0.25			0.33							
v/s Ratio Perm	0.02								0.00	0.00	0.00	
v/c Ratio	0.03	0.29			0.38				0.02	0.09	0.01	
Uniform Delay, d1	1.1	1.4			1.6				56.3	56.4	56.3	
Progression Factor	0.69	0.68			0.96				1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.2			0.3				0.1	0.7	0.0	
Delay (s)	0.8	1.2			1.8				56.4	57.1	56.3	
Level of Service	A	A			A				E	E	E	
Approach Delay (s)	1.1				1.8				56.4		56.6	
Approach LOS	A				A				E		E	
Intersection Summary												
HCM 2000 Control Delay	2.6		HCM 2000 Level of Service		A							
HCM 2000 Volume to Capacity ratio	0.37											
Actuated Cycle Length (s)	120.0		Sum of lost time (s)		12.2							
Intersection Capacity Utilization	47.9%		ICU Level of Service		A							
Analysis Period (min)	15											
c Critical Lane Group												

Timings
6: Speers Road/Cornwall Road & Cross Avenue
Future Total PM (Interim)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔
Traffic Volume (vph)	265	740	1315	10	420
Future Volume (vph)	265	740	1315	10	420
Turn Type	pm-pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2	2	6	4	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	Lag		
Lead-Lag Optimize?	Yes	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 2EBTL and 6:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated



Queues
6: Speers Road/Cornwall Road & Cross Avenue
Future Total PM (Interim)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	276	771	1386	10	438
v/c Ratio	0.64	0.26	0.67	0.05	0.80
Control Delay	26.9	3.8	22.0	54.2	30.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	26.9	3.8	22.0	54.2	30.8
Queue Length 50th (m)	32.1	21.7	126.6	2.6	21.7
Queue Length 95th (m)	68.7	37.0	165.1	7.8	40.5
Internal Link Dist (m)	474.4	77.5	60.0		
Turn Bay Length (m)	80.0		45.0		
Base Capacity (vph)	432	2921	2083	415	857
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	0.64	0.26	0.67	0.02	0.51

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 6: Speers Road/Cornwall Road & Cross Avenue
 Future Total PM (Interim)
 Upper Kerr Village (8/24-01)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	265	740	1315	15	10	420
Future Volume (vph)	265	740	1315	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	5.8
Lane Util. Factor	1.00	0.95	0.95	1.00	0.88	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Ft	1.00	1.00	1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1703	3610	3567	1805	2733	2733
Flt Permitted	0.11	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	194	3610	3567	1805	2733	2733
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	276	771	1370	16	10	438
RTOR Reduction (vph)	0	0	0	0	0	267
Lane Group Flow (vph)	276	771	1386	0	10	171
Confl. Peds. (#/hr)	5	5	5	5	5	5
Heavy Vehicles (%)	6%	0%	1%	0%	0%	4%
Turn Type	pm-apt	NA	NA	NA	Prot	Perm
Protected Phases	5	2	6	4		
Permitted Phases	2			4		
Actuated Green, G (s)	113.3	113.3	81.8	14.3	14.3	14.3
Effective Green, g (s)	113.3	113.3	81.8	14.3	14.3	14.3
Actuated G/C Ratio	0.81	0.81	0.58	0.10	0.10	0.10
Clearance Time (s)	6.0	6.6	6.6	5.8	5.8	5.8
Vehicle Extension (s)	3.5	5.0	5.0	3.0	3.0	3.0
Lane Grp Cap (vph)	431	2921	2084	184	279	279
v/s Ratio Prot	60.12	0.21	60.39	0.01		
v/s Ratio Perm	0.40					c0.06
v/c Ratio	0.64	0.26	0.66	0.05	0.61	
Uniform Delay, d1	26.3	3.2	19.8	56.7	60.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.4	0.2	1.7	0.1	4.0	
Delay (s)	29.7	3.5	21.5	56.9	64.2	
Level of Service	C	A	C	E	E	
Approach Delay (s)	10.4	21.5	64.0			
Approach LOS	B	C	E			
Intersection Summary						
HCM 2000 Control Delay	24.1 HCM 2000 Level of Service C					
HCM 2000 Volume to Capacity ratio	0.66					
Actuated Cycle Length (s)	140.0					
Intersection Capacity Utilization	75.2%					
Analysis Period (min)	15					
c Critical Lane Group						

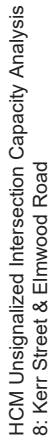
HCM Unsignalized Intersection Capacity Analysis
 7: Kerr Street & Prince Charles Drive
 Future Total PM (Interim)
 Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations											
Traffic Volume (veh/h)	10	0	10	10	0	30	5	530	10	20	655
Future Volume (Veh/h)	10	0	10	10	0	30	5	530	10	20	655
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	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
Hourly flow rate (vph)	11	0	11	11	0	32	5	568	11	21	689
Pedestrians	20	20	20	30	30	30	3.6	3.6	3.6	3.6	3.6
Lane Width (m)	3.6	3.6	3.6	1.1	1.1	1.1	3	3	3	3	3
Walking Speed (m/s)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Percent Blockage	2	2	2	3	3	3	None	None	None	None	None
Right turn flare (veh)											
Median type											
Median storage (veh)											
Upstream signal (m)							238	238	238	238	127
pX, platoon unblocked	0.79	0.79	0.75	0.79	0.79	0.93	0.75	0.75	0.93	0.83	0.83
vC, conflicting volume	1374	1373	722	1358	1380	598	735	735	598	589	589
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	1140	1138	465	1120	1148	531	482	482	531	531	531
IC, single (s)	7.1	7.0	6.2	7.1	6.5	6.2	4.3	4.3	6.2	4.1	4.1
IC, 2 stage (s)											
IF (s)	3.5	4.5	3.3	3.5	4.0	3.3	2.4	2.4	3.3	2.2	2.2
p0 queue free %	91	100	98	92	100	94	99	99	98	98	98
qM capacity (veh/h)	122	120	444	131	146	497	733	733	497	924	924
Direction_Lane #	EB 1	WB 1	NB 1	SB 1	SB 1						
Volume Total	22	43	574	736	736						
Volume Left	11	11	5	21	26						
Volume Right	11	32	11	26	26						
CSH	191	290	733	924	924						
Volume to Capacity	0.11	0.15	0.01	0.02	0.02						
Queue Length 95th (m)	2.9	3.9	0.2	0.5	0.6						
Control Delay (s)	26.2	19.6	0.2	0.6	0.6						
Lane LOS	D	C	A	A	A						
Approach Delay (s)	26.2	19.6	0.2	0.6	0.6						
Approach LOS	D	C	C	C	C						
Intersection Summary											
Average Delay	1.4										
Intersection Capacity Utilization	60.4%										
ICU Level of Service	B										
Analysis Period (min)	15										

8: Kerr Street & Elmwood Road

Future Total PM (Interim)
Upper Kerr Village (8/24-01)

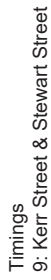
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			4	4	4
Traffic Volume (veh/h)	15	10	5	525	615	40
Future Volume (Veh/h)	15	10	5	525	615	40
Sign Control	Stop		Free	Free	Free	Free
Grade	0%		0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	11	5	553	647	42
Pedestrians	35					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	3					
Right turn flare (veh)				None	None	None
Median type						
Median storage (veh)						
Upstream signal (m)				103	262	
pX platoon unblocked	0.84	0.79	0.79			
VC, conflicting volume	1266	703	724			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	950	492	519			
IC, single (s)	6.4	6.3	4.3			
IC, 2 stage (s)						
p0 queue free %	3.5	3.4	2.4			
IF (s)	93	97	99			
CM capacity (veh/h)	235	429	736			
Direction_Lane #	EB 1	NB 1	SB 1			
Volume Total	27	558	689			
Volume Left	16	5	0			
Volume Right	11	0	42			
cSH	289	736	1700			
Volume to Capacity	0.09	0.01	0.41			
Queue Length 95th (m)	2.3	0.2	0.0			
Control Delay (s)	18.8	0.2	0.0			
Lane LOS	C	A	A			
Approach Delay (s)	18.8	0.2	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay				0.5		
Intersection Capacity Utilization				45.0%		A
Analysis Period (min)				15		



9: Kerr Street & Stewart Street

Future Total PM (Interim)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	4	4	8	8	2	2	1	6
Traffic Volume (vph)	50	10	10	15	10	405	55	505
Future Volume (vph)	50	10	10	15	10	405	55	505
Turn Type	Perm	NA	Perm	NA	Perm	NA	pm+pt	NA
Protected Phases	4		8		2		1	6
Permitted Phases	4	4	8	8	2	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%
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	0.0	0.0
Total Lost Time (s)	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Lead/Lag								
Lead-Lag Optimize?					Yes	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:NBLT and 6:SBTL, Start of Green								
Natural Cycle: 75								
Control Type: Actuated-Coordinated								



Queues
9: Kerr Street & Stewart Street

Future Total PM (Interim)
Upper Kerr Village (8/24-01)

	EBT	WBT	NBT	SBT
Lane Group	81	109	467	663
Lane Group Flow (vph)	0.29	0.29	0.36	0.56
v/c Ratio	21.6	10.0	8.0	11.0
Control Delay	0.0	0.0	0.0	0.0
Queue Delay	21.6	10.0	8.0	11.0
Total Delay	8.5	3.4	19.5	33.6
Queue Length 50th (m)	16.5	13.0	57.7	102.4
Queue Length 95th (m)	71.6	36.6	141.0	79.0
Internal Link Dist (m)				
Turn Bay Length (m)				
Base Capacity (vph)	444	552	1298	1192
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	0.18	0.20	0.36	0.56
Intersection Summary				

HCM Signalized Intersection Capacity Analysis
9: Kerr Street & Stewart Street

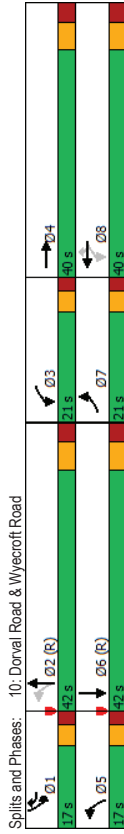
Future Total PM (Interim)
Upper Kerr Village (8/24-01)

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	405	15	55	505	50
Future Volume (vph)	50	10	15	10	15	75	10	405	15	55	505	50
Ideal Flow (vphpb)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4											
Lane Util. Factor	1.00											
Frb. ped/bikes	0.99											
Frb. ped/bikes	0.98											
Frt	0.97											
Flt Protected	0.97											
Satd. Flow (prot)	1661											
Flt Permitted	0.77											
Satd. Flow (perm)	1323											
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	440	16	60	549	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	466	0	0	660	0
Confl. Peds. (#/hr)	20	15	15	15	20	35	25	25	25	25	35	35
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Bus Blockages (#/hr)	0	2	0	0	2	0	0	0	0	0	3	0
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA	NA	pm-pt	NA	NA	NA
Protected Phases	4											
Permitted Phases	4											
Actuated Green, G (s)	13.2											
Effective Green, g (s)	13.2											
Actuated g/C Ratio	0.18											
Clearance Time (s)	5.4											
Vehicle Extension (s)	4.0											
Lane Grp Cap (vph)	232											
v/s Ratio Prot	c0.05											
v/s Ratio Perm	0.29											
Uniform Delay, d1	26.8											
Progression Factor	1.00											
Incremental Delay, d2	1.0											
Delay (s)	27.8											
Level of Service	C											
Approach Delay (s)	27.8											
Approach LOS	C											
Intersection Summary												
HCM 2000 Control Delay	9.6											
HCM 2000 Volume to Capacity ratio	0.54											
Actuated Cycle Length (s)	75.0											
Intersection Capacity Utilization	81.4%											
Analysis Period (min)	15											
c Critical Lane Group												

Timings 10: Dorval Road & Wyecroft Road Future Total PM (Interim) Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	←	←	←	←	←	←	←	←	←
Traffic Volume (vph)	385	225	60	95	490	95	1280	130	1130
Future Volume (vph)	385	225	60	95	490	95	1280	130	1130
Turn Type	Prot	NA	pm+pt	NA	pm+ov	pm+pt	NA	Prot	NA
Protected Phases	7	4	3	8	1	5	2	1	6
Permitted Phases	7	4	3	8	1	5	2	1	6
Detector Phase									
Switch Phase									
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	7.0	20.0	7.0	20.0
Minimum Split (s)	12.0	25.0	12.0	25.0	12.0	12.0	41.0	12.0	41.0
Total Split (s)	21.0	40.0	21.0	40.0	17.0	17.0	42.0	17.0	42.0
Total Split (%)	17.5%	33.3%	17.5%	33.3%	14.2%	14.2%	35.0%	14.2%	35.0%
Maximum Green (s)	16.0	33.0	16.0	33.0	12.0	12.0	35.0	12.0	35.0
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	3.0	4.0	3.0	4.0
All-Red Time (s)	2.0	3.0	2.0	3.0	2.0	2.0	3.0	2.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	5.0	7.0	5.0	5.0	7.0	5.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Gap (s)	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
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	None	None	C-Min
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	27.0	11.0	27.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0

Intersection Summary
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 103 (86%), Referenced to phase 2-NBTL and 6-SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated



Queues 10: Dorval Road & Wyecroft Road Future Total PM (Interim) Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	418	430	65	103	533	103	1434	141	1456
v/c Ratio	0.98	0.57	0.22	0.47	0.88	0.42	0.85	0.20	0.65
Control Delay	90.1	31.3	29.9	54.9	45.0	13.8	38.1	39.9	27.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	90.1	31.3	29.9	54.9	45.0	13.8	38.1	39.9	27.7
Queue Length 50th (m)	51.2	31.8	10.9	23.0	91.0	8.3	131.5	13.8	91.3
Queue Length 95th (m)	#82.7	46.3	19.4	37.7	129.7	m12.3,m#155.3	23.6	128.5	128.5
Internal Link Dist (m)	155.6	199.3					494.4		672.1
Turn Bay Length (m)	115.0	145.0			65.0		125.0		
Base Capacity (vph)	428	1001	372	474	607	269	1690	721	2253
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.43	0.17	0.22	0.88	0.38	0.85	0.20	0.65

Intersection Summary
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
 10: Dorval Road & Wynecroft Road

Future Total PM (Interim)
 Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	HT	HT	HT	F	F	F	HT	HT	HT	HT	HT	HT
Traffic Volume (vph)	385	225	170	60	95	490	95	1280	40	130	1130	210
Future Volume (vph)	385	225	170	60	95	490	95	1280	40	130	1130	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00	0.91	0.92	0.92	0.92	0.92	0.92
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3213	3233	1783	1727	1590	1736	5040	3502	4967	3502	4967	3502
Flt Permitted	0.95	1.00	0.50	1.00	1.00	1.00	0.14	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3213	3233	942	1727	1590	252	5040	3502	4967	3502	4967	3502
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)	418	245	185	65	103	533	103	1391	43	141	1228	228
RTOR Reduction (vph)	0	126	0	0	0	54	0	3	0	0	18	0
Lane Group Flow (vph)	418	304	0	65	103	479	103	1431	0	141	1438	0
Confl. Peds. (#/hr)	1	4	4	4	4	1	1	1	1	1	1	1
Heavy Vehicles (%)	9%	4%	2%	1%	10%	1%	4%	2%	2%	0%	1%	5%
Bus Blockages (#/hr)	0	2	0	0	0	0	0	3	0	0	0	0
Turn Types	Prot	NA	NA	pm+pt	NA	pm+ov	pm+pt	NA	Prot	NA	NA	NA
Protected Phases	7	4	3	8	1	5	2	1	6	1	6	1
Permitted Phases	8	8	8	8	2	8	2	2	2	2	2	2
Actuated Green, G (s)	16.0	23.1	25.1	16.1	40.8	50.1	39.2	24.7	53.0	24.7	53.0	33.0
Effective Green, g (s)	16.0	23.1	25.1	16.1	40.8	50.1	39.2	24.7	53.0	24.7	53.0	33.0
Actuated G/C Ratio	0.13	0.19	0.21	0.13	0.34	0.42	0.33	0.21	0.44	0.21	0.44	0.21
Clearance Time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap. (vph)	428	622	260	231	540	240	1646	720	2193	720	2193	1646
v/s Ratio Prot	cd.13	0.09	0.02	0.06	cd.18	0.04	cd.28	0.04	0.29	0.04	0.29	0.04
v/s Ratio Perm	0.03	0.03	0.03	0.12	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
v/c Ratio	0.98	0.49	0.25	0.45	0.89	0.43	0.87	0.20	0.66	0.20	0.66	0.66
Uniform Delay, d1	51.8	43.2	38.9	47.8	37.4	22.0	38.0	39.4	26.3	39.4	26.3	26.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	0.75	0.90	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	37.4	1.3	1.1	2.9	17.1	1.5	4.0	0.3	1.5	0.3	1.5	1.5
Delay (s)	89.2	44.5	40.0	50.7	54.5	18.1	38.3	39.7	27.9	39.7	27.9	27.9
Level of Service	F	D	D	D	D	B	D	D	C	D	C	C
Approach Delay (s)	66.5	52.6	52.6	52.6	52.6	36.9	52.6	52.6	28.9	52.6	28.9	28.9
Approach LOS	E	D	D	D	D	D	D	D	C	D	C	C
Intersection Summary												
HCM 2000 Control Delay	41.9 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.89											
Actuated Cycle Length (s)	120.0 Sum of lost time (s)											
Intersection Capacity Utilization	83.9% ICU Level of Service											
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
 11: Speers Road & Interim Connection

Future Total PM (Interim)
 Upper Kerr Village (8/24-01)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	HT	HT	HT	HT	HT	HT
Traffic Volume (veh/h)	0	875	1050	40	0	75
Future Volume (Veh/h)	0	875	1050	40	0	75
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	951	1141	43	0	82
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)	None	None	None	None	None	None
Median type						
Median storage (veh)						
Upstream signal (m)	73	162				
pX platoon unblocked	0.81				0.83	0.81
vC, conflicting volume	1184				1638	592
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	749				1118	15
IC, single (s)	4.1				6.8	6.9
IC, 2 stage (s)	2.2				3.5	3.3
p0 queue free %	100				100	90
dM capacity (veh/h)	690				167	856
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 1
Volume Total	476	476	761	423	82	82
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	43	82	82
cSH	1700	1700	1700	1700	856	856
Volume to Capacity	0.28	0.28	0.45	0.25	0.10	0.10
Queue Length 95th (m)	0.0	0.0	0.0	0.0	2.4	2.4
Control Delay (s)	0.0	0.0	0.0	0.0	9.6	9.6
Lane LOS	A	A	A	A	A	A
Approach Delay (s)	0.0	0.0	0.0	0.0	9.6	9.6
Approach LOS	A	A	A	A	A	A
Intersection Summary						
Average Delay	0.4					
Intersection Capacity Utilization	41.6%					
Analysis Period (min)	15					
ICU Level of Service	A					

HCM Unsignalized Intersection Capacity Analysis
 1: Kerr Street & Wycroft Road

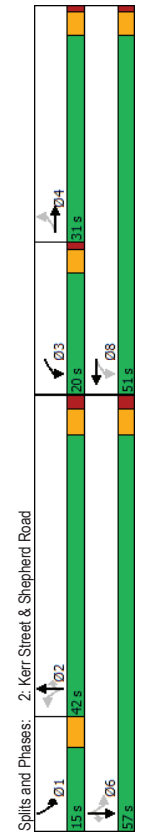
Future Total AM (Ultimate)
 Upper Kerr Village (8/24-01)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	5	100	220	355	515	125
Traffic Volume (veh/h)	5	100	220	355	515	125
Future Volume (Veh/h)	5	100	220	355	515	125
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	5	106	234	378	548	133
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)				None	None	None
Median type						
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	1272	340	681			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	1272	340	681			
IC, single (s)	6.8	7.0	4.1			
IC, 2 stage (s)	3.5	3.3	2.2			
p0 queue free %	96	84	74			
CM capacity (veh/h)	120	652	907			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	5	106	234	189	189	365 316
Volume Left	5	0	234	0	0	0 0
Volume Right	0	106	0	0	0	0 133
cSH	120	652	907	1700	1700	1700
Volume to Capacity	0.04	0.16	0.26	0.11	0.11	0.21 0.19
Queue Length 95th (m)	1.0	4.4	7.8	0.0	0.0	0.0 0.0
Control Delay (s)	36.2	11.6	10.3	0.0	0.0	0.0 0.0
Lane LOS	E	B	B	B	B	A
Approach Delay (s)	12.7		4.0			0.0
Approach LOS	B					
Intersection Summary						
Average Delay	2.7					
Intersection Capacity Utilization	43.7%					
Analysis Period (min)	15					

Timings
 2: Kerr Street & Shepherd Road

Future Total AM (Ultimate)
 Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	70	15	115	5	20	280	65	90	440	30
Traffic Volume (vph)	70	15	115	5	20	280	65	90	440	30
Future Volume (vph)	70	15	115	5	20	280	65	90	440	30
Turn Type	Perm	NA	pm-pt	NA	Perm	pm-pt	NA	Perm	pm-pt	NA
Protected Phases	4	3	8	2	2	2	2	1	6	6
Permitted Phases	4	4	3	8	2	2	2	1	6	6
Detector Phase										
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	18.0	18.0	18.0	7.0	18.0	18.0
Minimum Split (s)	22.0	22.0	9.0	22.0	28.2	28.2	28.2	11.0	28.2	28.2
Total Split (s)	31.0	31.0	20.0	51.0	42.0	42.0	42.0	15.0	57.0	57.0
Total Split (%)	28.7%	28.7%	18.5%	47.2%	38.9%	38.9%	38.9%	13.9%	52.8%	52.8%
Maximum Green (s)	27.0	27.0	16.0	47.0	36.8	36.8	36.8	11.0	51.8	51.8
Yellow Time (s)	3.0	3.0	3.0	3.0	3.3	3.3	3.3	4.0	3.3	3.3
All-Red Time (s)	1.0	1.0	1.0	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	4.0	4.0	5.2	5.2	5.2	4.0	5.2	5.2
Lead/Lag	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	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
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	None	None	None	Min	Min	Min	None	Min	Min
Walk Time (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	13.0	13.0	13.0	13.0	13.0	13.0
Pedestrian Calls (#/hr)	0	0	0	0	5	5	5	5	5	5
Intersection Summary										
Cycle Length	108									
Actuated Cycle Length	58.2									
Natural Cycle	75									
Control Type	Semi Ad-Uncoord									



Queues
2: Kerr Street & Shepherd Road

Future Total AM (Ultimate)
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group	76	49	126	241	22	308	71	99	484
Lane Group Flow (vph)	0.40	0.16	0.30	0.35	0.07	0.25	0.12	0.17	0.28
v/c Ratio	31.8	14.2	16.0	4.1	18.6	17.8	4.0	9.9	10.4
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	31.8	14.2	16.0	4.1	18.6	17.8	4.0	9.9	10.4
Total Delay	7.7	1.5	9.3	0.3	1.7	13.5	0.0	5.3	15.7
Queue Length 50th (m)	21.4	10.1	22.1	12.6	7.4	27.5	6.1	14.7	30.6
Queue Length 95th (m)	99.1		241.3		143.2			21.4	
Internal Link Dist (m)									
Turn Bay Length (m)					50.0		50.0		50.0
Base Capacity (vph)	570	859	586	1303	587	2314	1016	641	2979
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.06	0.22	0.18	0.04	0.13	0.07	0.15	0.16
Intersection Summary									

HCM Signalized Intersection Capacity Analysis
2: Kerr Street & Shepherd Road

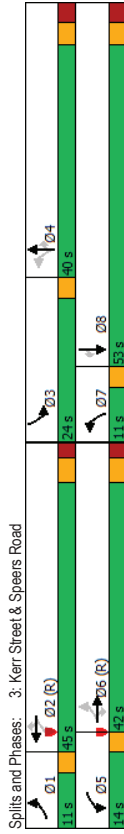
Future Total AM (Ultimate)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	70	15	30	115	5	215	20	280	65	90	440	30
Traffic Volume (vph)	70	15	30	115	5	215	20	280	65	90	440	30
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.0	4.0	4.0	4.0	4.0	4.0	5.2	5.2	5.2	4.0	5.2	5.2
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	0.95	1.00
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	0.95	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fibb. ped/bikes	1.00	0.90	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85
Frt	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Flt Protected	1770	1675	1668	1593	1770	1675	1770	1675	1498	1784	3505	1583
Satd. Flow (prot)	0.61	1.00	0.51	1.00	0.48	1.00	0.48	1.00	0.47	1.00	0.47	1.00
Flt Permitted	1134	1675	901	1583	887	3497	1498	885	3505	1583	1583	1583
Satd. Flow (perm)	0.92	0.92	0.91	0.92	0.91	0.92	0.91	0.91	0.91	0.91	0.91	0.92
Peak-Hour factor, PHF	76	16	33	126	5	236	22	308	71	99	484	33
Adj. Flow (vph)	0	28	0	155	0	0	0	47	0	0	16	0
RTOR Reduction (vph)	76	21	0	126	86	0	22	308	24	99	484	17
Lane Group Flow (vph)	2%	2%	2%	8%	2%	0%	2%	2%	5%	1%	3%	2%
Conf. Ped. (#/hr)	0	0	0	0	0	0	0	6	0	0	0	0
Heavy Vehicles (%)	0	0	0	0	0	0	0	0	0	0	0	0
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type	Perm	NA	NA	pm-pt	NA	Perm	NA	NA	pm-pt	NA	Perm	NA
Protected Phases	4	3	8	3	8	2	2	2	1	6	6	6
Permitted Phases	4	8	8	8	8	2	2	2	2	6	6	6
Actuated Green, G (s)	9.7	9.7	20.5	20.5	20.5	20.3	20.3	20.3	20.3	29.9	29.9	29.9
Effective Green, g (s)	9.7	9.7	20.5	20.5	20.5	20.3	20.3	20.3	20.3	29.9	29.9	29.9
Actuated g/C Ratio	0.16	0.16	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.50	0.50	0.50
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	5.2	5.2	5.2	5.2	4.0	5.2	5.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.5	3.5	3.5	3.5	2.5	3.5	3.5
Lane Grp Cap (vph)	184	272	397	547	302	1191	510	528	1758	794	794	794
v/s Ratio Prot	0.01	c0.04	0.05	0.02	0.09	0.02	0.02	0.08	0.14	0.01	0.01	0.01
v/s Ratio Perm	c0.07	0.07	0.07	0.32	0.16	0.07	0.26	0.05	0.19	0.28	0.02	0.02
v/c Ratio	0.41	0.08	0.32	0.16	0.07	0.26	0.05	0.19	0.28	0.02	0.02	0.02
Uniform Delay, d1	22.4	21.2	14.0	13.6	13.3	14.2	13.2	8.0	8.6	7.5	7.5	7.5
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	1.5	0.1	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Delay (s)	23.9	21.3	14.5	13.7	13.4	14.3	13.2	8.1	8.7	7.5	7.5	7.5
Level of Service	C	C	B	B	B	B	B	B	B	A	A	A
Approach Delay (s)	22.9		14.0		14.1		14.1		8.5			
Approach LOS	C		B		B		B		A			
Intersection Summary												
HCM 2000 Control Delay	12.5								B			
HCM 2000 Volume to Capacity ratio	0.35											
Actuated Cycle Length (s)	59.6								17.2			
Intersection Capacity Utilization	63.7%								B			
Analysis Period (min)	15											
c Critical Lane Group												

Timings 3: Kerr Street & Speers Road Future Total AM (Ultimate) Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4
Traffic Volume (vph)	40	740	90	195	550	195	100	130	370	360	180	85
Future Volume (vph)	40	740	90	195	550	195	100	130	370	360	180	85
Turn Type	pm-pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	6	6	2	2	2	4	4	4	3	8	8
Permitted Phases	1	6	6	2	2	2	4	4	4	3	8	8
Detector Phase												
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)	6.0	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
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
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	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	14.0	14.0
Pedestrian Calls (#/hr)	15	15	15	15	15	15	15	35	35	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



Queues 3: Kerr Street & Speers Road Future Total AM (Ultimate) Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	47	860	105	227	640	227	116	151	430	419	209	99
v/c Ratio	0.13	0.77	0.19	0.77	0.46	0.31	0.29	0.34	0.91	0.80	0.34	0.17
Control Delay	16.2	35.1	4.7	41.1	30.0	4.9	20.5	38.3	50.8	60.8	30.1	5.3
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	16.2	35.1	4.7	41.1	30.0	4.9	20.5	38.3	50.8	60.8	30.1	5.3
Queue Length 50th (m)	3.8	106.2	1.4	32.8	62.9	0.0	14.4	28.1	61.9	49.1	34.4	0.0
Queue Length 95th (m)	10.1	124.4	5.4	#70.9	79.3	14.3	23.0	43.5	#102.8	62.2	49.3	9.5
Internal Link Dist (m)	145.3			474.4			103.4				143.2	
Turn Bay Length (m)	105.0	75.0	75.0	75.0	75.0	75.0	50.0	50.0	45.0	80.0	75.0	75.0
Base Capacity (vph)	376	1119	550	293	1387	738	410	517	519	583	718	648
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	0.13	0.77	0.19	0.77	0.46	0.31	0.28	0.29	0.83	0.72	0.29	0.15

Intersection Summary
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

3: Kerr Street & Speers Road

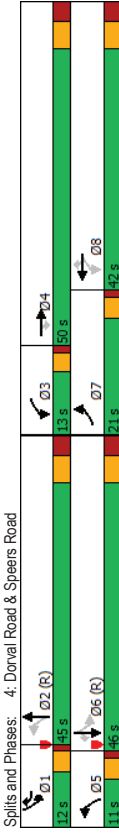
Future Total AM (Ultimate)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	7	4	4	4	4	4	4	4	4	4	4
Traffic Volume (vph)	40	740	90	195	550	195	100	130	370	360	180	85
Future Volume (vph)	40	740	90	195	550	195	100	130	370	360	180	85
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	0.93	1.00	1.00	0.95
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00
Ft	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	0.95	1.00	1.00	0.95
Satd. Flow (prot)	1799	3378	1437	1687	3438	1495	1676	1844	1429	3335	1845	1511
Flt Permitted	0.38	1.00	1.00	0.14	1.00	1.00	0.63	1.00	0.63	1.00	0.85	1.00
Satd. Flow (perm)	723	3378	1437	255	3438	1495	1106	1844	1429	3335	1845	1511
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	47	860	105	227	640	227	116	151	430	419	209	99
RTOR Reduction (vph)	0	0	70	0	0	137	0	0	125	0	0	66
Lane Group Flow (vph)	47	860	35	227	640	90	116	151	305	419	209	33
Confl. Peds. (#/hr)	15	10	10	10	10	15	20	35	35	35	20	20
Heavy Vehicles (%)	0%	6%	7%	7%	5%	4%	6%	1%	5%	5%	3%	2%
Bus Blockages (#/hr)	0	4	0	0	0	0	0	5	0	0	0	0
Turn Type	pm-pt	NA	Perm	pm-pt	NA	Perm	pm-pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	6	5	2	2	7	4					
Permitted Phases	6	6	2	2	4	4	4					8
Actuated Green, G (s)	45.6	39.7	39.7	56.7	47.8	47.8	37.1	29.3	29.3	18.8	40.3	40.3
Effective Green, g (s)	45.6	39.7	39.7	56.7	47.8	47.8	37.1	29.3	29.3	18.8	40.3	40.3
Actuated G/C Ratio	0.38	0.33	0.33	0.47	0.40	0.40	0.31	0.24	0.24	0.16	0.34	0.34
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)	327	1117	475	287	1389	595	378	450	348	522	619	507
v/s Ratio Prot	0.01	0.25		c0.09	0.19		0.02	0.08		c0.13	0.11	
v/s Ratio Perm	0.05		0.02	c0.28	0.06		0.07					0.02
v/s Ratio	0.14	0.77	0.07	0.79	0.47	0.15	0.31	0.34	0.88	0.80	0.34	0.07
Uniform Delay, d1	23.7	36.0	27.5	23.2	26.7	23.1	30.8	37.3	43.6	48.8	29.9	27.1
Progression Factor	0.82	0.80	0.79	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	5.0	0.3	13.4	1.1	0.5	0.3	0.6	21.7	8.5	0.4	0.1
Delay (s)	19.6	33.9	21.9	36.6	27.8	23.7	31.1	37.9	65.3	57.3	30.3	27.1
Level of Service	B	C	C	D	C	C	C	D	E	E	C	C
Approach Delay (s)												
Approach LOS	C	C	C	C	C	C	D	D	D	D	D	D
Intersection Summary												
HCM 2000 Control Delay												D
HCM 2000 Volume to Capacity ratio												0.84
Actuated Cycle Length (s)												18.2
Intersection Capacity Utilization												D
Analysis Period (min)												15
Critical Lane Group												

4: Dorval Road & Speers Road

Future Total AM (Ultimate)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4
Traffic Volume (vph)	415	610	40	90	415	345	70	865	270	535	255
Future Volume (vph)	415	610	40	90	415	345	70	865	270	535	255
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8	8	1	5	2	1	6
Detector Phase	7	4	4	3	8	1	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	7.0	20.0	20.0
Minimum Split (s)	11.0	42.0	42.0	11.0	42.0	11.0	11.0	40.0	11.0	40.0	40.0
Total Split (s)	21.0	50.0	50.0	13.0	42.0	12.0	11.0	45.0	12.0	46.0	46.0
Total Split (%)	17.5%	41.7%	41.7%	10.8%	35.0%	10.0%	9.2%	37.5%	10.0%	38.3%	38.3%
Maximum Green (s)	17.0	43.0	43.0	9.0	35.0	8.0	7.0	36.0	8.0	39.0	39.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	3.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	1.0	1.0	3.0	1.0	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
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0
Minimum Gap (s)	3.0	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	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	0.0
Recall Mode	None	None	None	None	None	None	None	C-Min	None	C-Min	C-Min
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0
Pedestrian Calls (#/hr)	5	5	5	5	5	5	5	5	5	5	5
Intersection Summary											
Cycle Length: 120											
Actuated Cycle Length: 120											
Offset: 41 (34%), Referenced to phase 2:NBLT and 6:SBTL, Start of Green											
Natural Cycle: 125											
Control Type: Actuated-Coordinated											



Queues 4: Dorval Road & Speers Road Future Total AM (Ultimate) Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group	451	663	43	98	451	375	76	1076	293	582	277
Lane Group Flow (vph)	0.94	0.70	0.09	0.39	0.65	0.59	0.19	0.97	0.95	0.39	0.37
v/c Ratio	79.4	42.3	0.3	21.4	39.1	13.5	18.2	60.6	68.0	10.4	2.9
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	79.4	42.3	0.3	21.4	39.1	13.5	18.2	60.6	68.0	10.4	2.9
Queue Length 50th (m)	54.8	74.2	0.0	6.8	42.5	36.3	8.6	129.7	35.8	38.5	0.0
Queue Length 95th (m)	#85.1	83.8	0.0	13.0	59.5	51.3	19.6	#174.3 m#135.4	42.9	m12.9	
Internal Link Dist (m)	412.3			472.1			621.6		494.4		
Turn Bay Length (m)	60.0		60.0	85.0		55.0	70.0		110.0		
Base Capacity (vph)	481	1192	600	256	949	639	391	1111	307	1474	751
Stavation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.56	0.07	0.38	0.48	0.69	0.19	0.97	0.95	0.39	0.37

Intersection Summary
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis 4: Dorval Road & Speers Road Future Total AM (Ultimate) Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	TT	TT	T	T	T	T	T	T	T	T	T
Traffic Volume (vph)	415	610	40	90	415	345	70	865	135	270	535
Future Volume (vph)	415	610	40	90	415	345	70	865	135	270	535
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	0.98
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	1.00	1.00	0.85
Flt Flow (prot)	3400	3329	1482	1656	3256	1494	1785	3476	1687	3539	1417
Flt Permitted	0.95	1.00	1.00	0.32	1.00	1.00	0.43	1.00	0.10	1.00	1.00
Satd. Flow (perm)	3400	3329	1482	553	3256	1494	813	3476	169	3539	1417
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
Adj. Flow (vph)	451	663	43	98	451	375	76	929	147	293	582
RTOR Reduction (vph)	0	0	31	0	0	70	0	10	0	0	163
Lane Group Flow (vph)	451	663	12	98	451	305	76	1066	0	293	582
Confl. Peds. (#/hr)	5			5		5		5		5	5
Heavy Vehicles (%)	3%	8%	9%	9%	10%	7%	1%	2%	0%	7%	2%
Bus Blockages (#/hr)	0	2	0	0	4	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm-pt	NA	pm-pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2	1	6	
Permitted Phases			4	8	8	8	2		6		6
Actuated Green, G (s)	17.0	34.0	34.0	34.2	25.6	43.0	44.2	38.0	59.4	49.2	49.2
Effective Green, g (s)	17.0	34.0	34.0	34.2	25.6	43.0	44.2	38.0	59.4	49.2	49.2
Actuated g/C Ratio	0.14	0.28	0.28	0.29	0.21	0.36	0.37	0.32	0.49	0.41	0.41
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	481	943	419	236	694	535	349	1100	303	1450	580
v/s Ratio Prot	c0.13	c0.20		0.03	0.14	0.08	0.01	0.31	c0.14	0.16	
v/s Ratio Perm			0.01	0.09	0.12	0.07			c0.34		0.08
v/c Ratio	0.94	0.70	0.03	0.42	0.65	0.57	0.22	0.97	0.97	0.40	0.20
Uniform Delay, d1	51.0	38.5	31.1	32.7	43.1	31.0	25.0	40.4	36.3	25.0	22.7
Progression Factor	1.00	1.00	1.00	0.79	0.82	0.52	1.00	1.00	1.05	0.37	0.86
Incremental Delay, d2	26.0	3.0	0.1	1.2	2.8	1.4	0.3	20.6	35.0	0.6	0.5
Delay (s)	76.9	41.5	31.1	27.1	38.1	17.6	25.3	61.0	73.1	9.8	13.4
Level of Service	E	D	C	C	D	B	C	E	E	A	B
Approach Delay (s)		54.9			28.6		58.7		26.8		
Approach LOS		D			C		E		C		C
Intersection Summary											
HCM 2000 Control Delay			43.0							D	
HCM 2000 Volume to Capacity ratio			0.94								
Actuated Cycle Length (s)			120.0							22.0	
Intersection Capacity Utilization			87.3%							E	
Analysis Period (min)			15								
c Critical Lane Group											

Timings
5. St. Augustine Drive & Speers Road

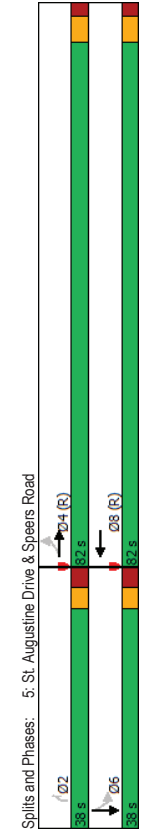
Queues
5. St. Augustine Drive & Speers Road

Future Total AM (Ultimate)
Upper Kerr Village (8/24-01)

Future Total AM (Ultimate)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	WBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	55	850	730	20	15	0
Future Volume (vph)	55	850	730	20	15	0
Turn Type	Perm	NA	NA	Perm	NA	NA
Protected Phases	4	8	8	6	6	6
Permitted Phases	4	4	8	2	6	6
Detector Phase	4	4	8	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.9	23.9	23.9	24.3	24.3	24.3
Total Split (s)	82.0	82.0	82.0	38.0	38.0	38.0
Total Split (%)	68.3%	68.3%	68.3%	31.7%	31.7%	31.7%
Maximum Green (s)	76.1	76.1	76.1	31.7	31.7	31.7
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	2.2	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.9	5.9	6.3	6.3	6.3
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	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
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Min	C-Min	C-Min	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 51 (43%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated



Lane Group	EBL	EBT	WBT	NBR	SBL	SBT
Lane Group Flow (vph)	63	983	841	23	17	176
v/c Ratio	0.12	0.34	0.29	0.10	0.15	0.63
Control Delay	1.7	1.6	5.1	0.8	55.1	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.7	1.6	5.1	0.8	55.1	16.2
Queue Length 50th (m)	1.5	13.8	34.4	0.0	3.9	0.0
Queue Length 95th (m)	m2.2	m15.0	44.1	0.0	10.7	15.3
Internal Link Dist (m)		472.1	42.5			
Turn Bay Length (m)		50.0				
Base Capacity (vph)	528	2869	2870	519	476	567
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 v/c Ratio	0.12	0.34	0.29	0.04	0.04	0.31

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

5. St. Augustine Drive & Speers Road

6. Speers Road/Cornwall Road & Cross Avenue

Future Total AM (Ultimate)

Future Total AM (Ultimate)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	5	5	15	15	15	10	10	10	20	15	15
Traffic Volume (vph)	55	850	15	0	730	10	0	0	0	20	15	155
Future Volume (vph)	55	850	15	0	730	10	0	0	0	20	15	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9	5.9	5.9	5.9	5.9	6.3	6.3	6.3	6.3	6.3	6.3
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	0.86	1.00	0.85	1.00	0.85	1.00
Ft	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1796	3430	3430	3430	3430	3430	1565	1805	1615	1615	1615	1615
Flt Permitted	0.33	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	631	3430	3430	3430	3430	3430	1565	1805	1615	1615	1615	1615
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	62	966	17	0	830	11	0	0	23	17	0	176
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	22	0	165	0
Lane Group Flow (vph)	63	983	0	0	841	0	0	0	1	17	11	0
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	0%	5%	0%	0%	5%	5%	0%	0%	5%	0%	0%	0%
Turn Type	Perm	NA	NA	NA	NA	NA	NA	NA	NA	Perm	Perm	NA
Protected Phases	4											6
Permitted Phases	4											6
Actuated Green, G (s)	100.4	100.4	100.4	100.4	100.4	100.4	7.4	7.4	7.4	7.4	7.4	7.4
Effective Green, g (s)	100.4	100.4	100.4	100.4	100.4	100.4	7.4	7.4	7.4	7.4	7.4	7.4
Actuated G/C Ratio	0.84	0.84	0.84	0.84	0.84	0.84	0.06	0.06	0.06	0.06	0.06	0.06
Clearance Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	6.3	6.3	6.3	6.3	6.3	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	527	2869			2869				96	111	99	
v/s Ratio Prot		c0.29			0.25							0.01
v/s Ratio Perm	0.10				0.00				0.00	c0.01		
v/c Ratio	0.12	0.34			0.29				0.01	0.15	0.11	
Uniform Delay, d1	1.8	2.2			2.1				52.9	53.3	53.2	
Progression Factor	0.65	0.57			2.16				1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.2			0.2				0.1	0.6	0.5	
Level of Service	A	A			A				D	D	D	
Approach Delay (s)	1.5	1.5	4.8	4.8	4.8				52.9		53.7	
Approach LOS	A	A	A	A	A				D		D	
Intersection Summary												
HCW 2000 Control Delay	8.2											
HCW 2000 Volume to Capacity ratio	0.33											
Actuated Cycle Length (s)	120.0											
Intersection Capacity Utilization	49.4%											
Analysis Period (min)	15											
c Critical Lane Group												

Future Total AM (Ultimate)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	5	5	15	15	15	10	10	10	20	15	15
Traffic Volume (vph)	205	1260	625	5	245	5	245	5	245	5	245	245
Future Volume (vph)	205	1260	625	5	245	5	245	5	245	5	245	245
Turn Type	pm-pt	NA	NA	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm	Perm
Protected Phases	5	2	2	6	4	4	4	4	4	4	4	4
Detector Phase	5	2	2	6	4	4	4	4	4	4	4	4
Switch Phase	6.0	38.0	38.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Initial (s)	12.0	47.6	47.6	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8
Minimum Split (s)	35.0	109.0	74.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0
Total Split (%)	25.0%	77.9%	52.9%	22.1%	22.1%	22.1%	22.1%	22.1%	22.1%	22.1%	22.1%	22.1%
Maximum Green (s)	29.0	102.4	67.4	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
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)	6.0	6.6	6.6	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Lead/Lag	Lead	Lag	Lag									
Lead-Lag Optimize?	Yes	Yes	Yes									
Vehicle Extension (s)	3.5	5.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
Recall Mode	None	C-Min	C-Min	None	None	None	None	None	None	None	None	None
Walk Time (s)	10.0	10.0	10.0									
Flash Dont Walk (s)	31.0	31.0	31.0									
Pedestrian Calls (#/hr)	5	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											



Queues
6: Speers Road/Cornwall Road & Cross Avenue

Future Total AM (Ultimate)
Upper Kerr Village (8/24-01)

	EBL	EBT	WBT	SBL	SBR
Lane Group	241	1482	759	6	288
Lane Group Flow (vph)	0.43	0.51	0.30	0.05	0.63
v/c Ratio	4.5	4.0	7.3	60.6	12.9
Control Delay	0.0	0.0	0.0	0.0	0.0
Queue Delay	4.5	4.0	7.3	60.6	12.9
Total Delay	9.4	47.2	34.4	1.6	0.0
Queue Length 50th (m)	14.5	56.3	44.8	5.7	11.7
Queue Length 95th (m)	47.4	77.5	60.0		
Internal Link Dist (m)	80.0		45.0		
Turn Bay Length (m)	718	2905	2501	324	705
Base Capacity (vph)	0	0	0	0	0
Stavation 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	0.34	0.51	0.30	0.02	0.41
Intersection Summary					

HCM Signalized Intersection Capacity Analysis
6: Speers Road/Cornwall Road & Cross Avenue

Future Total AM (Ultimate)
Upper Kerr Village (8/24-01)

	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔
Traffic Volume (vph)	205	1260	625	20	5
Future Volume (vph)	205	1260	625	20	5
Ideal Flow (vphpb)	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
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00
Fibb. 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)	1686	3471	3451	1805	2608
Flt Permitted	0.33	1.00	1.00	0.95	1.00
Satd. Flow (perm)	583	3471	3451	1805	2608
Peak-Hour factor, PHF	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	241	1482	735	24	6
RTOR Reduction (vph)	0	0	1	0	0
Lane Group Flow (vph)	241	1482	758	0	6
Confl. Peds. (#/hr)	5		5		
Heavy Vehicles (%)	7%	4%	4%	5%	9%
Turn Type	pm-apt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2			4	
Actuated Green, G (s)	117.2	117.2	101.5	10.4	10.4
Effective Green, g (s)	117.2	117.2	101.5	10.4	10.4
Actuated g/C Ratio	0.84	0.84	0.72	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)	564	2905	2501	134	193
v/s Ratio Prot	0.03	0.43	0.22	0.00	
v/c Ratio Perm	0.33			0.01	
v/c Ratio	0.43	0.51	0.30	0.04	0.11
Uniform Delay, d1	2.8	3.2	6.8	60.2	60.5
Progression Factor	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.6	0.3	0.1	0.3
Delay (s)	3.4	3.9	7.1	60.3	60.7
Level of Service	A	A	A	E	E
Approach Delay (s)	3.8	7.1	60.7		
Approach LOS	A	A	E		
Intersection Summary					
HCM 2000 Control Delay		10.7		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio		0.50			
Actuated Cycle Length (s)		140.0		Sum of lost time (s)	18.4
Intersection Capacity Utilization		69.2%		ICU Level of Service	C
Analysis Period (min)		15			
c. Critical Lane Group					

7: Kerr Street & Prince Charles Drive

8: Kerr Street & Elmwood Road

Future Total AM (Ultimate)

Future Total AM (Ultimate)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	0	5	5	0	40	5	555	5	40	410	5
Traffic Volume (veh/h)	5	0	5	5	0	40	5	555	5	40	410	5
Future Volume (Veh/h)	5	0	5	5	0	40	5	555	5	40	410	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	6	0	6	6	0	48	6	661	6	48	488	6
Pedestrians	15			30								
Lane Width (m)	3.6			3.6								
Walking Speed (m/s)	1.1			1.1								
Percent Blockage	1			3								
Right turn flare (veh)												
Median type							None	None	None	None	None	None
Median storage (veh)												
Upstream signal (m)							238					127
pX platoon unblocked	0.90	0.90	0.83	0.90	0.90	0.87	0.83			0.87		
VC, conflicting volume	1326	1311	506	1299	1311	694	509			697		
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	976	959	306	946	959	571	309			575		
IC, single (s)	7.1	6.5	6.5	7.1	6.5	6.3	4.3			4.2		
IC, 2 stage (s)												
p0 queue free %	3.5	4.0	3.6	3.5	4.0	3.4	2.3			2.3		
IF (s)	96	100	99	97	100	89	99			94		
CM capacity (veh/h)	168	209	548	194	209	427	965			822		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	EB 1	NB 1	SB 1					
Volume Total	12	54	673	542								
Volume Left	6	6	6	48								
Volume Right	6	48	6	6								
cSH	268	376	965	822								
Volume to Capacity	0.05	0.14	0.01	0.06								
Queue Length 95th (m)	1.1	3.8	0.1	1.4								
Control Delay (s)	19.7	16.2	0.2	1.6								
Lane LOS	C	C	A	A								
Approach Delay (s)	19.7	16.2	0.2	1.6								
Approach LOS	C	C	C	C								
Intersection Summary												
Average Delay	1.6											
Intersection Capacity Utilization	58.7%											
ICU Level of Service	B											
Analysis Period (min)	15											

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	20	10	5	535	380	30
Traffic Volume (veh/h)	20	10	5	535	380	30
Future Volume (Veh/h)	20	10	5	535	380	30
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	24	12	6	629	447	35
Pedestrians	20			5		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	2			0		
Right turn flare (veh)						
Median type				None	None	None
Median storage (veh)						
Upstream signal (m)				103	262	
pX platoon unblocked	0.90	0.90	0.90			
VC, conflicting volume	1126	490	502			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	835	379	393			
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
p0 queue free %	92	98	99			
IF (s)	288	592	1041			
CM capacity (veh/h)	288	592	1041			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	36	635	482			
Volume Left	24	6	0			
Volume Right	12	0	35			
cSH	357	1041	1700			
Volume to Capacity	0.10	0.01	0.28			
Queue Length 95th (m)	2.5	0.1	0.0			
Control Delay (s)	16.2	0.2	0.0			
Lane LOS	C	A	A			
Approach Delay (s)	16.2	0.2	0.0			
Approach LOS	C	C	C			
Intersection Summary						
Average Delay	0.6					
Intersection Capacity Utilization	43.7%					
ICU Level of Service	A					
Analysis Period (min)	15					

Timings
9: Kerr Street & Stewart Street

Queues
9: Kerr Street & Stewart Street

Future Total AM (Ultimate)
Upper Kerr Village (8/24-01)

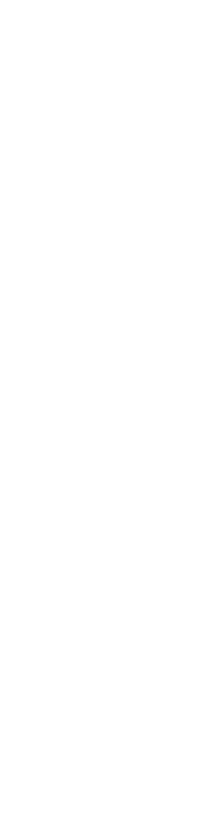
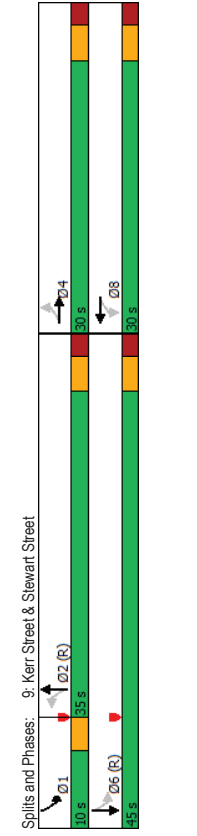
Future Total AM (Ultimate)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	35	25	20	35	5	430	40	310
Traffic Volume (vph)	35	25	20	35	5	430	40	310
Future Volume (vph)	Perm	NA	Perm	NA	Perm	NA	prn+pt	NA
Turn Type	4	8	8	2	2	1	6	6
Protected Phases	4	8	8	2	2	1	6	6
Detector Phase	4	8	8	2	2	1	6	6
Switch Phase	10.0	10.0	10.0	10.0	24.0	24.0	6.0	24.0
Minimum Initial (s)	30.0	30.0	30.0	30.0	32.0	32.0	10.0	32.0
Minimum Split (s)	30.0	30.0	30.0	30.0	35.0	35.0	10.0	45.0
Total Split (s)	40.0%	40.0%	40.0%	40.0%	46.7%	46.7%	13.3%	60.0%
Total Split (%)	24.6	24.6	24.6	24.6	29.6	29.6	7.0	39.6
Maximum Green (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.0	3.3
Yellow Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	2.1
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Total Lost Time (s)	Lead/Lag	Lag	Lag	Lead	Lead	Lead	Yes	Yes
Lead/Lag	Yes	Yes	Yes	Yes	Yes	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

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	79	152	554	464
v/c Ratio	0.28	0.40	0.48	0.45
Control Delay	23.8	14.2	9.8	9.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.8	14.2	9.8	9.5
Queue Length 50th (m)	9.6	8.7	25.4	20.2
Queue Length 95th (m)	15.4	16.8	63.5	52.9
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)	459	559	1156	1036
Base Capacity (vph)	0	0	0	0
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	0.17	0.27	0.48	0.45

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

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



9: Kerr Street & Stewart Street

Future Total AM (Ultimate)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	35	25	5	20	35	70	5	430	20	40	310	30
Traffic Volume (vph)	35	25	5	20	35	70	5	430	20	40	310	30
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99	1.00	0.99
Fpb. ped/bikes	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Frt	0.97	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Flt Protected	1701	1612	1775	1775	1775	1775	1775	1775	1775	1775	1729	1729
Satd. Flow (prot)	0.79	0.94	1.00	1.00	1.00	1.00	1.00	0.91	1.00	0.91	1.00	0.91
Flt Permitted	1388	1532	1769	1769	1769	1769	1769	1581	1769	1581	1769	1581
Satd. Flow (perm)	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Peak-hour factor, PHF	43	30	6	24	43	85	6	524	24	49	378	37
Adj. Flow (vph)	0	5	0	0	68	0	0	1	0	0	3	0
RTOR Reduction (vph)	0	74	0	0	84	0	0	553	0	0	461	0
Lane Group Flow (vph)	20	20	20	20	20	30	20	30	35	35	30	30
Confl. Peds. (#/hr)	2%	7%	16%	0%	5%	4%	28%	6%	0%	2%	6%	6%
Heavy Vehicles (%)	0	2	0	0	2	0	0	0	0	0	0	4
Bus Blockages (#/hr)	Perm	NA	NA	Perm	NA	Perm	NA	NA	pm-pt	NA	NA	NA
Turn Type	4	8	2	8	2	2	2	2	1	6	6	6
Protected Phases	15.2	15.2	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0
Actuated Green, G (s)	0.20	0.20	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Effective Green, g (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Actuated G/C Ratio	281	310	1155	1155	1155	1155	1155	1032	1155	1032	1155	1032
Clearance Time (s)	0.05	0.26	0.27	0.27	0.27	0.27	0.27	0.29	0.45	0.45	0.45	0.45
Vehicle Extension (s)	25.2	25.2	6.6	6.6	6.6	6.6	6.6	6.4	6.4	6.4	6.4	6.4
Lane Grp Cap. (vph)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
v/s Ratio Prot	0.7	0.7	1.4	1.4	1.4	1.4	1.4	0.3	0.3	0.3	0.3	0.3
v/s Ratio Perm	25.9	25.9	8.0	8.0	8.0	8.0	8.0	6.7	6.7	6.7	6.7	6.7
Uniform Delay, d1	C	C	A	A	A	A	A	A	A	A	A	A
Progression Factor	25.9	25.9	8.0	8.0	8.0	8.0	8.0	6.7	6.7	6.7	6.7	6.7
Incremental Delay, d2	C	C	A	A	A	A	A	A	A	A	A	A
Level of Service	C	C	A	A	A	A	A	A	A	A	A	A
Approach Delay (s)	C	C	A	A	A	A	A	A	A	A	A	A
Approach LOS	C	C	A	A	A	A	A	A	A	A	A	A
Intersection Summary	<p>HCM 2000 Control Delay: 10.8 HCM 2000 Level of Service: B</p> <p>HCM 2000 Volume to Capacity ratio: 0.45</p> <p>Actuated Cycle Length (s): 75.0 Sum of lost time (s): 13.8</p> <p>Intersection Capacity Utilization: 67.6% ICU Level of Service: C</p> <p>Analysis Period (min): 15</p>											
Critical Lane Group	c											

10: Donval Road & Wyecroft Road

Future Total AM (Ultimate)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	17	4	3	8	2	2	8	2	2	1	6	6
Traffic Volume (vph)	215	120	20	130	110	1410	160	1025	160	1025	160	1025
Future Volume (vph)	215	120	20	130	110	1410	160	1025	160	1025	160	1025
Turn Type	Prot	NA	pm-pt	NA	pm-pt	NA	Prot	NA	NA	Prot	NA	NA
Protected Phases	7	4	3	8	2	2	8	2	2	1	6	6
Detector Phase	7	4	3	8	2	2	8	2	2	1	6	6
Switch Phase	7.0	10.0	7.0	10.0	7.0	20.0	7.0	20.0	7.0	20.0	7.0	20.0
Minimum Initial (s)	12.0	25.0	12.0	25.0	12.0	41.0	12.0	41.0	12.0	41.0	12.0	41.0
Minimum Split (s)	21.0	40.0	21.0	40.0	17.0	42.0	21.0	42.0	21.0	42.0	21.0	42.0
Total Split (%)	17.5%	33.3%	17.5%	33.3%	14.2%	35.0%	14.2%	35.0%	14.2%	35.0%	14.2%	35.0%
Maximum Green (s)	16.0	33.0	16.0	33.0	12.0	35.0	16.0	35.0	16.0	35.0	16.0	35.0
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	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)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
Recall Mode	None	None	None	None	None	None	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	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Intersection Summary	<p>Cycle Length: 120</p> <p>Actuated Cycle Length: 120</p> <p>Offset: 118 (98%), Referenced to phase 2:NETL and 6:SBT, Start of Green</p> <p>Natural Cycle: 90</p> <p>Control Type: Actuated-Coordinated</p>											
Splits and Phases	<p>10: Donval Road & Wyecroft Road</p> <p>Ø1 17 s Ø2 (R) 42 s Ø3 21 s Ø4 40 s</p> <p>Ø5 17 s Ø6 (R) 42 s Ø7 21 s Ø8 40 s</p>											

Queues
10: Dorval Road & Wynecroft Road

Future Total AM (Ultimate)
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	234	239	22	413	120	1598	174	1592
Lane Group Flow (vph)	0.60	0.29	0.08	0.69	0.54	0.72	0.46	0.74
v/c Ratio	56.6	20.9	27.6	26.8	26.3	19.8	53.5	29.2
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	56.6	20.9	27.6	26.8	26.3	19.8	53.5	29.2
Queue Length 50th (m)	27.0	11.8	3.6	20.8	8.1	100.3	20.1	104.6
Queue Length 95th (m)	40.0	24.2	8.9	35.5	m/13.6	m/50.6	30.3	#/49.3
Internal Link Dist (m)	155.6		145.0	199.3	494.4		672.1	
Turn Bay Length (m)	115.0		416	367	1029	239	2210	390
Base Capacity (vph)	0	0	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.25	0.06	0.40	0.50	0.72	0.45	0.74

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
10: Dorval Road & Wynecroft Road

Future Total AM (Ultimate)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	TT	TT	T	T	TT	TT	TT	TT	TT
Traffic Volume (vph)	215	120	100	20	130	250	110	1410	60
Future Volume (vph)	215	120	100	20	130	250	110	1410	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0
Lane Util. Factor	0.97	0.95	1.00	0.95	1.00	0.91	1.00	0.97	0.91
Fpb. ped/bikes	1.00	0.99	1.00	0.99	1.00	0.99	1.00	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Frt	1.00	0.93	1.00	0.90	1.00	0.99	1.00	0.95	1.00
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	3127	3079	1637	3125	1641	5036	3433	4672	3433
Flt Permitted	0.95	1.00	0.60	1.00	0.08	1.00	0.95	1.00	0.95
Satd. Flow (perm)	3127	3079	1039	3125	140	5036	3433	4672	3433
Peak-Hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	234	130	109	22	141	272	120	1533	65
RTOR Reduction (vph)	0	82	0	0	199	0	0	3	0
Lane Group Flow (vph)	234	157	0	22	214	0	120	1595	0
Confl. Peds. (#/hr)	2	3	3	3	2	1	2	1	1
Heavy Vehicles (%)	12%	7%	9%	10%	5%	2%	10%	2%	1%
Bus Blockages (#/hr)	0	2	0	0	0	0	3	0	0
Turn Type	Prot	NA	NA	pm-pt	NA	pm-pt	NA	Prot	NA
Protected Phases	7	4	3	8	5	2	1	6	6
Permitted Phases			8		2				
Actuated Green, G (s)	14.9	29.3	22.2	18.3	61.1	49.5	13.3	51.2	13.3
Effective Green, g (s)	14.9	29.3	22.2	18.3	61.1	49.5	13.3	51.2	13.3
Actuated g/C Ratio	0.12	0.24	0.18	0.15	0.51	0.41	0.11	0.43	0.11
Clearance Time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	388	751	211	476	216	2077	380	1993	380
v/s Ratio Prot	c0.07	0.05	0.00	c0.07	c0.05	0.32	0.05	c0.33	0.05
v/s Ratio Perm			0.02		0.23				
v/c Ratio	0.60	0.21	0.10	0.45	0.56	0.77	0.46	0.77	0.46
Uniform Delay, d1	49.8	36.1	40.4	46.3	20.0	30.3	50.0	29.4	50.0
Progression Factor	1.00	1.00	1.00	1.00	1.18	0.64	1.00	1.00	1.00
Incremental Delay, d2	3.9	0.3	0.5	1.4	2.4	1.3	1.8	3.0	1.8
Delay (s)	53.6	36.4	40.9	47.7	26.0	20.6	51.8	32.4	51.8
Level of Service	D	D	D	D	C	C	D	C	D
Approach Delay (s)		44.9		47.3		20.9		34.3	
Approach LOS		D		D		C		C	

Intersection Summary	
HCM 2000 Control Delay	31.5
HCM 2000 Volume to Capacity ratio	0.66
Actuated Cycle Length (s)	120.0
Intersection Capacity Utilization	73.9%
Analysis Period (min)	15
c Critical Lane Group	

1: Kerr Street & Wycroft Road

Future Total PM (Ultimate)

Upper Kerr Village (8/24-01)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	25	155	130	680	560	110
Future Volume (Veh/h)	25	155	130	680	560	110
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	27	167	140	731	602	118
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	1312	365	725			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	1312	365	725			
IC, single (s)	6.8	7.0	4.2			
IC, 2 stage (s)						
p0 queue free %	3.5	3.3	2.3			
IF (s)	79	73	83			
CM capacity (veh/h)	127	623	844			
Direction_Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	27	167	140	366	366	401 319
Volume Left	27	0	140	0	0	0 0
Volume Right	0	167	0	0	0	0 118
cSH	127	623	844	1700	1700	1700
Volume to Capacity	0.21	0.27	0.17	0.21	0.21	0.24 0.19
Queue Length 95th (m)	5.8	8.2	4.5	0.0	0.0	0.0 0.0
Control Delay (s)	40.9	12.9	10.1	0.0	0.0	0.0 0.0
Lane LOS	E	B	B			
Approach Delay (s)	16.8		1.6			0.0
Approach LOS	C					
Intersection Summary						
Average Delay	2.6					
Intersection Capacity Utilization	39.6%					
Analysis Period (min)	15					
	ICU Level of Service A					



2: Kerr Street & Shepherd Road

Future Total PM (Ultimate)

Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	45	10	95	15	45	570	105	155	465	60
Future Volume (vph)	45	10	95	15	45	570	105	155	465	60
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	pm-pt	NA	Perm
Protected Phases	4		8		8		2	1	6	
Permitted Phases	4	4	8	8	2	2	2	1	6	6
Detector Phase										
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	18.0	18.0	18.0	7.0	18.0	18.0
Minimum Split (s)	22.0	22.0	22.0	22.0	28.2	28.2	28.2	11.0	28.2	28.2
Total Split (s)	33.0	33.0	33.0	33.0	53.0	53.0	53.0	22.0	75.0	75.0
Total Split (%)	30.6%	30.6%	30.6%	30.6%	49.1%	49.1%	49.1%	20.4%	69.4%	69.4%
Maximum Green (s)	29.0	29.0	29.0	29.0	47.8	47.8	47.8	18.0	69.8	69.8
Yellow Time (s)	3.0	3.0	3.0	3.0	3.3	3.3	3.3	4.0	3.3	3.3
All-Red Time (s)	1.0	1.0	1.0	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	4.0	4.0	5.2	5.2	5.2	4.0	5.2	5.2
Lead/Lag					Lag	Lag	Lag	Lead	Lead	
Lead-Lag Optimize?					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
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	None	None	None	Min	Min	Min	None	Min	Min
Walk Time (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	13.0	13.0	13.0	13.0	13.0	13.0
Pedestrian Calls (#/hr)	0	0	0	0	5	5	5	5	5	5
Intersection Summary										
Cycle Length: 108										
Actuated Cycle Length: 49.1										
Natural Cycle: 65										
Control Type: Semi Ad-Uncooord										



Queues
2: Kerr Street & Shepherd Road

HCM Signalized Intersection Capacity Analysis
2: Kerr Street & Shepherd Road

Future Total PM (Ultimate)
Upper Kerr Village (8/24-01)

Future Total PM (Ultimate)
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group	49	33	98	165	49	588	108	160	479
Lane Group Flow (vph)	0.22	0.10	0.40	0.39	0.14	0.43	0.16	0.27	0.21
v/c Ratio	19.9	11.2	23.1	8.1	12.1	12.7	3.7	5.0	4.6
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	19.9	11.2	23.1	8.1	12.1	12.7	3.7	5.0	4.6
Total Delay	3.5	0.8	7.2	1.1	2.5	18.0	0.0	4.1	7.4
Queue Length 50th (m)	11.6	6.4	19.9	13.7	9.1	34.5	7.4	11.2	15.5
Queue Length 95th (m)	110.5		241.3		143.2			21.4	
Internal Link Dist (m)									
Turn Bay Length (m)					50.0		50.0		50.0
Base Capacity (vph)	723	1008	789	1011	851	3385	1471	844	3574
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.03	0.12	0.16	0.06	0.17	0.07	0.19	0.13
Intersection Summary									

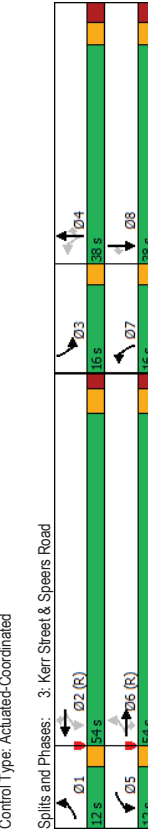
	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	45	10	20	95	15	145	45	570	105
Traffic Volume (vph)	45	10	20	95	15	145	45	570	105
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Fibb. ped/bikes	1.00	0.90	1.00	0.86	1.00	1.00	1.00	0.85	1.00
Frt	0.95	1.00	1.00	0.99	1.00	1.00	1.00	0.95	1.00
Flt Protected	1770	1676	1732	1601	1770	3539	1543	1804	3574
Satd. Flow (prot)	0.65	1.00	0.74	1.00	0.48	1.00	1.00	0.34	1.00
Flt Permitted	1214	1676	1341	1601	891	3539	1543	638	3574
Satd. Flow (perm)	0.92	0.92	0.92	0.97	0.92	0.97	0.97	0.97	0.92
Peak-Hour factor, PHF	49	11	22	98	16	149	49	588	108
Adj. Flow (vph)	0	18	0	0	121	0	0	66	0
RTOR Reduction (vph)	49	15	0	98	44	0	49	588	42
Lane Group Flow (vph)	15							5	
Confl. Peds. (#/hr)	2%	2%	3%	2%	1%	2%	1%	2%	0%
Heavy Vehicles (%)	0	0	0	0	0	0	5	0	0
Bus Blockages (#/hr)	Perm	NA	Perm	NA	Perm	NA	Perm	pm-pt	NA
Turn Type	4				8			2	1
Protected Phases	4				8			2	6
Permitted Phases	9.2	9.2	9.2	9.2	9.2	9.2	19.0	19.0	30.6
Actuated Green, G (s)	9.2	9.2	9.2	9.2	9.2	9.2	19.0	19.0	30.6
Effective Green, g (s)	0.19	0.19	0.19	0.19	0.19	0.19	0.39	0.39	0.62
Actuated g/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	5.2	5.2	4.0
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.5	3.5	2.5
Vehicle Extension (s)	227	314	251	300	345	1372	598	579	2231
Lane Grp Cap (vph)	0.04				0.03			0.04	0.13
v/s Ratio Prot	0.22	0.05	c0.07		0.05		0.03	0.13	0.03
v/s Ratio Perm	16.8	16.3	17.4	16.6	9.7	11.0	9.4	4.1	4.0
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	0.5	0.1	1.0	0.2	0.2	0.3	0.1	0.2	0.1
Incremental Delay, d2	17.3	16.4	18.4	16.8	9.9	11.3	9.5	4.3	4.0
Delay (s)	B	B	B	B	A	B	A	A	A
Level of Service	B	B	B	B	A	B	A	A	A
Approach Delay (s)	16.9		17.4		10.9		4.1		
Approach LOS	B		B		B		A		
Intersection Summary									
HCM 2000 Control Delay	9.5								A
HCM 2000 Volume to Capacity ratio	0.39								
Actuated Cycle Length (s)	49.0								13.2
Intersection Capacity Utilization	60.5%								B
Analysis Period (min)	15								
c. Critical Lane Group									

Timings
3: Kerr Street & Speers Road

Future Total PM (Ultimate)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	65	585	130	300	915	510	145	190	235	290	275	50
Traffic Volume (vph)	65	585	130	300	915	510	145	190	235	290	275	50
Future Volume (vph)	pm-pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Turn Type	1	6	6	2	2	2	4	4	4	4	3	8
Protected Phases	6	6	6	2	2	2	4	4	4	4	3	8
Permitted Phases	1	6	6	5	2	2	7	7	7	4	4	8
Detector Phase	1	6	6	5	2	2	7	7	7	4	4	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	16.0	38.0	38.0	16.0	38.0	38.0
Total Split (%)	10.0%	45.0%	45.0%	10.0%	45.0%	45.0%	13.3%	31.7%	31.7%	13.3%	31.7%	31.7%
Maximum Green (s)	9.0	48.1	48.1	9.0	48.1	48.1	13.0	31.7	31.7	13.0	31.7	31.7
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
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
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	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	14.0	14.0
Pedestrian Calls (#/hr)	15	15	15	15	15	15	35	35	35	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
3: Kerr Street & Speers Road

Future Total PM (Ultimate)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	68	616	137	316	963	537	153	200	247	305	289	53
v/c Ratio	0.21	0.40	0.18	0.65	0.54	0.53	0.52	0.56	0.52	0.82	0.75	0.14
Control Delay	11.5	25.2	10.2	22.6	23.8	4.0	32.7	48.9	9.2	70.4	57.2	3.7
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	11.5	25.2	10.2	22.6	23.8	4.0	32.7	48.9	9.2	70.4	57.2	3.7
Queue Length 50th (m)	8.4	55.3	8.8	35.1	82.3	0.0	25.1	42.6	1.3	36.7	64.5	0.0
Queue Length 95th (m)	19.0	92.3	20.3	#70.7	119.7	21.7	36.7	60.8	21.1	#57.6	87.8	4.6
Internal Link Dist (m)	138.4			474.4			103.4				143.2	
Turn Bay Length (m)	105.0		75.0	75.0		100.0	50.0		45.0	80.0		75.0
Base Capacity (vph)	344	1557	768	483	1781	1014	317	495	569	381	501	456
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	0.20	0.40	0.18	0.65	0.54	0.53	0.48	0.40	0.43	0.80	0.58	0.12

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

3: Kerr Street & Speers Road

Future Total PM (Ultimate)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR																																																																	
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔																																																																	
Traffic Volume (vph)	65	585	130	300	915	510	145	190	235	290	275	50																																																																	
Future Volume (vph)	65	585	130	300	915	510	145	190	235	290	275	50																																																																	
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																																																																	
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00																																																																	
Frb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00																																																																	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00																																																																	
Satd. Flow (prot)	1802	3511	1560	1750	3539	1485	1772	1877	1486	3467	1900	1501																																																																	
Flt Permitted	0.24	1.00	1.00	0.33	1.00	1.00	0.31	1.00	1.00	0.85	1.00	1.00																																																																	
Satd. Flow (perm)	446	3511	1560	609	3539	1485	584	1877	1486	3467	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	616	137	316	963	537	153	200	247	305	289	53																																																																	
RTOR Reduction (vph)	0	0	76	0	0	269	0	0	194	0	0	42																																																																	
Lane Group Flow (vph)	68	616	61	316	963	268	153	200	53	305	289	11																																																																	
Confl. Peds. (#/hr)	30	5	5	5	5	30	35	35	35	35	35	35																																																																	
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%																																																																	
Bus Blockages (#/hr)	0	4	0	0	0	0	0	3	0	0	0	0																																																																	
Turn Type	pm-pt	NA	Perm	pm-pt	NA	Perm	pm-pt	NA	Perm	Prot	NA	Perm																																																																	
Protected Phases	1	6	5	2	2	7	4			3	8																																																																		
Permitted Phases	6	6	2	2	2	4	4			4	8																																																																		
Actuated Green, G (s)	59.4	53.2	53.2	69.0	59.8	59.8	34.4	22.9	22.9	12.9	24.3	24.3																																																																	
Effective Green, g (s)	59.4	53.2	53.2	69.0	59.8	59.8	34.4	22.9	22.9	12.9	24.3	24.3																																																																	
Actuated G/C Ratio	0.49	0.44	0.44	0.58	0.50	0.50	0.29	0.19	0.19	0.11	0.20	0.20																																																																	
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)	290	1556	691	471	1763	740	281	368	283	372	384	303																																																																	
v/s Ratio Prot	0.01	0.18	0.04	c0.07	0.27	0.05	0.11			c0.09	c0.15																																																																		
v/s Ratio Perm	0.10	0.31	0.04	0.18	0.10	0.10	0.04			0.04	0.04	0.01																																																																	
v/s Ratio	0.23	0.40	0.09	0.67	0.55	0.36	0.54	0.56	0.19	0.82	0.75	0.04																																																																	
Uniform Delay, d1	16.5	22.6	19.3	14.2	20.7	18.4	34.0	44.0	40.7	52.4	45.0	38.4																																																																	
Progression Factor	0.81	1.03	2.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00																																																																	
Incremental Delay, d2	0.3	0.7	0.2	3.4	1.2	1.4	1.7	2.3	0.4	12.9	8.6	0.1																																																																	
Delay (s)	13.7	23.9	49.5	17.6	22.0	19.8	35.7	46.3	41.2	65.3	53.6	38.5																																																																	
Level of Service	B	C	D	B	C	B	D	D	D	E	D	D																																																																	
Approach Delay (s)	27.3			20.6			41.5			57.9																																																																			
Approach LOS	C			C			D			E																																																																			
Intersection Summary	<table border="1"> <tr> <td>HCM 2000 Control Delay</td> <td colspan="12">31.4</td> </tr> <tr> <td>HCM 2000 Volume to Capacity Ratio</td> <td colspan="12">0.73</td> </tr> <tr> <td>Actuated Cycle Length (s)</td> <td colspan="12">120.0</td> </tr> <tr> <td>Intersection Capacity Utilization</td> <td colspan="12">78.9%</td> </tr> <tr> <td>Analysis Period (min)</td> <td colspan="12">15</td> </tr> </table>												HCM 2000 Control Delay	31.4												HCM 2000 Volume to Capacity Ratio	0.73												Actuated Cycle Length (s)	120.0												Intersection Capacity Utilization	78.9%												Analysis Period (min)	15											
HCM 2000 Control Delay	31.4																																																																												
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Actuated Cycle Length (s)	120.0																																																																												
Intersection Capacity Utilization	78.9%																																																																												
Analysis Period (min)	15																																																																												
Critical Lane Group	c																																																																												

4: Dorval Road & Speers Road

Future Total PM (Ultimate)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR																																																																		
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔																																																																		
Traffic Volume (vph)	415	535	50	180	710	505	65	635	295	710	375																																																																		
Future Volume (vph)	415	535	50	180	710	505	65	635	295	710	375																																																																		
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm+pt	NA	pm+pt	NA	Perm																																																																		
Protected Phases	7	4		3	8	1	5	2	1	6																																																																			
Permitted Phases	7	4	4	4	3	8	1	5	2	1	6																																																																		
Switch Phase																																																																													
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	7.0	20.0	20.0																																																																		
Minimum Split (s)	11.0	42.0	42.0	11.0	42.0	11.0	11.0	40.0	11.0	40.0	40.0																																																																		
Total Split (s)	19.0	44.0	44.0	17.0	42.0	19.0	11.0	40.0	19.0	48.0	48.0																																																																		
Total Split (%)	15.8%	36.7%	36.7%	14.2%	35.0%	15.8%	9.2%	33.3%	15.8%	40.0%	40.0%																																																																		
Maximum Green (s)	15.0	37.0	37.0	13.0	35.0	15.0	7.0	33.0	15.0	41.0	41.0																																																																		
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	3.0	4.0	3.0	4.0	4.0																																																																		
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	1.0	1.0	3.0	1.0	3.0	3.0																																																																		
Last 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																																																																		
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0																																																																		
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lag																																																																		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes																																																																		
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0																																																																		
Minimum Gap (s)	3.0	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	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	0.0																																																																		
Recall Mode	None	None	None	None	None	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	7.0	7.0	7.0																																																																		
Flash Dont Walk (s)	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0																																																																		
Pedestrian Calls (#/hr)	5	5	5	5	5	5	5	5	5	5	5																																																																		
Intersection Summary	<table border="1"> <tr> <td>Cycle Length</td> <td colspan="12">120</td> </tr> <tr> <td>Actuated Cycle Length</td> <td colspan="12">120</td> </tr> <tr> <td>Offset: 17 (14%), Referenced to phase 2:NBLT and 6:SBTL, Start of Green</td> <td colspan="12">17</td> </tr> <tr> <td>Natural Cycle</td> <td colspan="12">115</td> </tr> <tr> <td>Control Type</td> <td colspan="12">Actuated-Coordinated</td> </tr> </table>												Cycle Length	120												Actuated Cycle Length	120												Offset: 17 (14%), Referenced to phase 2:NBLT and 6:SBTL, Start of Green	17												Natural Cycle	115												Control Type	Actuated-Coordinated											
Cycle Length	120																																																																												
Actuated Cycle Length	120																																																																												
Offset: 17 (14%), Referenced to phase 2:NBLT and 6:SBTL, Start of Green	17																																																																												
Natural Cycle	115																																																																												
Control Type	Actuated-Coordinated																																																																												
Splits and Phases																																																																													

Queues
4: Dorval Road & Speers Road

Future Total PM (Ultimate)
Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group	451	582	54	196	772	549	71	777	321	772	408
Lane Group Flow (vph)	0.97	0.53	0.09	0.52	0.79	0.74	0.25	0.83	0.97	0.59	0.50
v/c Ratio	87.3	36.4	0.3	36.1	59.3	27.1	21.4	49.4	77.5	16.8	2.7
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	87.3	36.4	0.3	36.1	59.3	27.1	21.4	49.4	77.5	16.8	2.7
Total Delay	-59.7	59.5	0.0	30.5	79.5	42.1	9.2	88.4	-57.3	61.4	4.5
Queue Length 50th (m)	#91.8	77.1	0.0	63.4	118.4	107.4	17.7	111.6	#22.9	34.0	4.2
Queue Length 95th (m)	412.3			472.1			621.6			494.4	
Internal Link Dist (m)	60.0	60.0	85.0	55.0	70.0	110.0					
Turn Bay Length (m)	464	1107	584	394	1034	738	279	974	331	1310	810
Base Capacity (vph)	0	0	0	0	0	0	0	0	0	0	0
Stavation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.53	0.09	0.50	0.75	0.74	0.25	0.80	0.97	0.59	0.50
Intersection Summary											
~ Volume exceeds capacity, queue is theoretically infinite.											
Queue shown is maximum after two cycles.											
# 95th percentile volume exceeds capacity, queue may be longer.											
Queue shown is maximum after two cycles.											

HCM Signalized Intersection Capacity Analysis
4: Dorval Road & Speers Road

Future Total PM (Ultimate)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	
Lane Configurations	FF	FF	F	FF	FF	F	FF	FF	FF	FF	FF	
Traffic Volume (vph)	415	535	50	180	710	505	65	635	80	295	710	
Future Volume (vph)	415	535	50	180	710	505	65	635	80	295	710	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	
Fpb. ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flt Protected	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	1.00	1.00	0.85	
Flt	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	3433	3560	1556	1786	3546	1581	1805	3514	1787	3574	1599	
Flt Permitted	0.95	1.00	1.00	0.36	1.00	1.00	0.32	1.00	0.13	1.00	1.00	
Satd. Flow (perm)	3433	3560	1556	671	3546	1581	599	3514	240	3574	1599	
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	
Adj. Flow (vph)	451	582	54	196	772	549	71	690	87	321	772	
RTOR Reduction (vph)	0	0	37	0	0	43	0	8	0	0	0	
Lane Group Flow (vph)	451	582	17	196	772	506	71	769	0	321	772	
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5	
Heavy Vehicles (%)	2%	1%	2%	1%	1%	1%	0%	1%	1%	1%	1%	
Bus Blockages (#/hr)	0	2	0	0	4	0	0	0	0	0	0	
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm-pt	NA	pm-pt	NA	Perm	
Protected Phases	7	4		3	8	1	5	2	1	6		
Permitted Phases			4	8	8	8	2		6		6	
Actuated Green, G (s)	16.2	37.2	37.2	45.0	33.0	50.1	37.3	31.7	52.8	43.2	43.2	
Effective Green, g (s)	16.2	37.2	37.2	45.0	33.0	50.1	37.3	31.7	52.8	43.2	43.2	
Actuated G/C Ratio	0.13	0.31	0.31	0.38	0.28	0.42	0.31	0.26	0.44	0.36	0.36	
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0	
Lane Grp Cap (vph)	463	1103	482	363	975	660	242	928	326	1286	575	
v/s Ratio Prot	c0.13	0.16		0.05	c0.22	0.11	0.01	0.22	c0.14	0.22		
v/s Ratio Perm			0.01	0.15	0.21	0.08			c0.29		0.11	
v/c Ratio	0.97	0.53	0.03	0.54	0.79	0.77	0.29	0.83	0.98	0.60	0.32	
Uniform Delay, d1	51.7	34.2	28.9	26.5	40.3	30.0	29.7	41.6	33.1	31.4	27.7	
Progression Factor	1.00	1.00	1.00	1.60	1.31	0.93	1.00	1.00	1.47	0.48	0.18	
Incremental Delay, d2	34.9	0.9	0.1	1.5	5.0	5.2	0.7	8.4	39.9	1.6	1.1	
Delay (s)	86.6	35.0	28.9	43.9	57.8	33.1	30.4	50.0	88.5	16.7	6.1	
Level of Service	F	D	C	D	E	C	C	D	F	B	A	
Approach Delay (s)	56.1			47.1			48.4			29.1		
Approach LOS	E			D			D			C		
Intersection Summary												
HCM 2000 Control Delay	43.9			HCM 2000 Level of Service			D					
HCM 2000 Volume to Capacity ratio	0.94											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			22.0					
Intersection Capacity Utilization	87.7%			ICU Level of Service			E					
Analysis Period (min)	15											
c. Critical Lane Group												

Timings
5. St. Augustine Drive & Speers Road

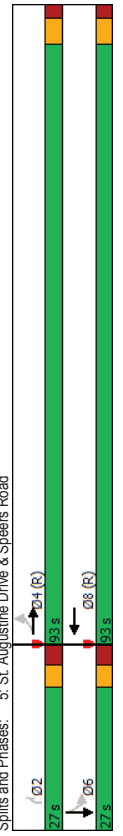
Queues
5. St. Augustine Drive & Speers Road

Future Total PM (Ultimate)
Upper Kerr Village (8/24-01)

Future Total PM (Ultimate)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	WBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	125	760	1070	25	15	0
Future Volume (vph)	125	760	1070	25	15	0
Turn Type	Perm	NA	NA	Perm	NA	NA
Protected Phases	4	8	8	6	6	6
Permitted Phases	4	4	8	2	6	6
Detector Phase	4	4	8	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.9	23.9	23.9	24.3	24.3	24.3
Total Split (s)	93.0	93.0	93.0	27.0	27.0	27.0
Total Split (%)	77.5%	77.5%	77.5%	22.5%	22.5%	22.5%
Maximum Green (s)	87.1	87.1	87.1	20.7	20.7	20.7
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	2.2	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.9	5.9	6.3	6.3	6.3
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	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
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Min	C-Min	C-Min	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 27 (23%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated



Lane Group	EBL	EBT	WBT	NBR	SBL	SBT
Lane Group Flow (vph)	130	818	1151	26	16	99
v/c Ratio	0.34	0.27	0.38	0.08	0.16	0.45
Control Delay	4.0	1.5	6.7	0.4	57.1	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.0	1.5	6.7	0.4	57.1	9.3
Queue Length 50th (m)	4.2	13.2	91.9	0.0	3.7	0.0
Queue Length 95th (m)	m4.2	m10.0	137.3	0.0	10.8	6.6
Internal Link Dist (m)		472.1	49.4			
Turn Bay Length (m)	50.0					
Base Capacity (vph)	379	2992	2995	497	311	395
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 v/c Ratio	0.34	0.27	0.38	0.05	0.05	0.25

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

5. St. Augustine Drive & Speers Road

Future Total PM (Ultimate)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	125	760	25	0	1070	35	0	0	25	15	0	95
Future Volume (vph)	125	760	25	0	1070	35	0	0	25	15	0	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1800	3550	3555	3555	3555	3555	1644	1805	1615	1615	1615	1615
Flt Permitted	0.24	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	450	3550	3555	3555	3555	3555	1644	1805	1615	1615	1615	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	130	792	26	0	1115	36	0	0	26	16	0	99
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	25	0	93	0
Lane Group Flow (vph)	130	817	0	0	1150	0	0	0	1	16	6	0
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	NA	NA	NA	NA	NA	NA	Perm	Perm	NA	NA
Protected Phases	4											6
Permitted Phases	4								2	6		6
Actuated Green, G (s)	101.1	101.1			101.1				6.7	6.7		6.7
Effective Green, g (s)	101.1	101.1			101.1				6.7	6.7		6.7
Actuated G/C Ratio	0.84	0.84			0.84				0.06	0.06		0.06
Clearance Time (s)	1.8	5.9	5.9	5.9	5.9	5.9	5.9	5.9	6.3	6.3	6.3	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	379	2990			2995				91	100		90
v/s Ratio Prot	0.23				c0.32							0.00
v/s Ratio Perm	0.29				0.38				0.00	c0.01		0.06
v/c Ratio	0.34	0.27			0.38				0.02	0.16		0.06
Uniform Delay, d1	2.1	1.9			2.2				53.5	54.0		53.7
Progression Factor	0.94	0.70			2.81				1.00	1.00		1.00
Incremental Delay, d2	1.8	0.2			0.3				0.1	0.8		0.3
Delay (s)	3.7	1.5			6.5				53.6	54.7		54.0
Level of Service	A	A			A				D	D		D
Approach Delay (s)	1.8				6.5				53.6			54.1
Approach LOS	A				A				D			D
Intersection Summary												
HCM 2000 Control Delay	7.5 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.37											
Actuated Cycle Length (s)	120.0 Sum of lost time (s)											
Intersection Capacity Utilization	58.6% ICU Level of Service											
Analysis Period (min)	15											
c Critical Lane Group												

6. Speers Road/Cornwall Road & Cross Avenue

Future Total PM (Ultimate)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	265	750	1340	10	420							
Future Volume (vph)	265	750	1340	10	420							
Turn Type	pm-pt	NA	NA	NA	Prot	Perm						
Protected Phases	5	2	6	4								
Permitted Phases	5	2	6	4								
Detector Phase	5	2	6	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	Lag									
Lead-Lag Optimize?	Yes	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	6: Speers Road/Cornwall Road & Cross Avenue											
Diagram												

Queues
6: Speers Road/Cornwall Road & Cross Avenue

Future Total PM (Ultimate)
Upper Kerr Village (8/24-01)

	EBL	EBT	WBT	SBL	SBR
Lane Group	276	781	1412	10	438
Lane Group Flow (vph)	0.64	0.27	0.69	0.05	0.80
v/c Ratio	29.4	3.8	23.2	54.0	31.4
Control Delay	0.0	0.0	0.0	0.0	0.0
Queue Delay	29.4	3.8	23.2	54.0	31.4
Total Delay	#73.4	37.7	169.8	7.8	41.1
Queue Length 50th (m)					
Queue Length 95th (m)					
Internal Link Dist (m)	474.4	77.5	60.0		
Turn Bay Length (m)	80.0		45.0		
Base Capacity (vph)	432	2916	2053	415	854
Stavation 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	0.64	0.27	0.69	0.02	0.51

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
6: Speers Road/Cornwall Road & Cross Avenue

Future Total PM (Ultimate)
Upper Kerr Village (8/24-01)

	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔
Traffic Volume (vph)	265	750	1340	15	420
Future Volume (vph)	265	750	1340	15	420
Ideal Flow (vphpb)	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
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00
Fibb. 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	0.10	1.00	1.00	0.95	1.00
Satd. Flow (perm)	178	3610	3567	1805	2733
Peak-Hour factor, PHF	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	276	781	1396	16	438
RTOR Reduction (vph)	0	0	0	0	263
Lane Group Flow (vph)	276	781	1412	0	175
Confl. Peds. (#/hr)	5	5	5	5	5
Heavy Vehicles (%)	6%	0%	1%	0%	4%

Turn Type	pm-apt	NA	NA	Prot	Perm
Protected Phases	5	2	6		
Permitted Phases	2			4	
Actuated Green, G (s)	113.1	113.1	80.6	14.5	14.5
Effective Green, g (s)	113.1	113.1	80.6	14.5	14.5
Actuated g/C Ratio	0.81	0.81	0.58	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)	432	2916	2053	186	283
v/s Ratio Prot	c0.12	0.22	c0.40		0.01
v/s Ratio Perm	0.39				c0.06
v/c Ratio	0.64	0.27	0.69	0.05	0.62
Uniform Delay, d1	28.5	3.3	20.9	56.6	60.1
Progression Factor	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.2	0.2	1.9	0.1	4.0
Delay (s)	31.7	3.5	22.8	56.7	64.1
Level of Service	C	A	C	E	E
Approach Delay (s)		10.9	22.8	64.0	
Approach LOS		B	C	E	

Intersection Summary	
HCM 2000 Control Delay	24.8
HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67
Actuated Cycle Length (s)	140.0
Sum of lost time (s)	18.4
Intersection Capacity Utilization	75.9%
ICU Level of Service	D
Analysis Period (min)	15
c Critical Lane Group	

7: Kerr Street & Prince Charles Drive

8: Kerr Street & Elmwood Road

Future Total PM (Ultimate)

Future Total PM (Ultimate)

Future Total PM (Ultimate)

Future Total PM (Ultimate)

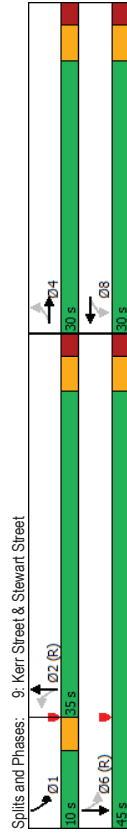
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	10	10	0	30	5	545	10	20	670	25
Future Volume (Veh/h)	10	0	10	10	0	30	5	545	10	20	670	25
Sign Control	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	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	574	11	21	705	26
Pedestrians	20			30								5
Lane Width (m)	3.6			3.6								3.6
Walking Speed (m/s)	1.1			1.1								1.1
Percent Blockage	2			3								0
Right turn flare (veh)												
Median type							None					None
Median storage (veh)												
Upstream signal (m)								238				127
pX platoon unblocked	0.79	0.79	0.75	0.79	0.79	0.92	0.75					0.92
VC, conflicting volume	1406	1405	738	1390	1412	614	751					615
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	1157	1155	481	1137	1165	539	499					540
IC, single (s)	7.1	7.0	6.2	7.1	6.5	6.2	4.3					4.1
IC, 2 stage (s)												
p0 queue free %	3.5	4.5	3.3	3.5	4.0	3.3	2.4					2.2
IF (s)	91	100	97	91	100	93	99					98
CM capacity (veh/h)	119	117	433	127	143	488	719					909
Direction_Lane #	EB 1	WB 1	NB 1	SB 1	EB 1	NB 1	SB 1					
Volume Total	22	43	580	752								
Volume Left	11	11	5	21								
Volume Right	11	32	11	26								
cSH	186	283	719	909								
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)	26.9	20.0	0.2	0.6								
Lane LOS	D	C	A	A								
Approach Delay (s)	26.9	20.0	0.2	0.6								
Approach LOS	D	C	A	A								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			61.2%									B
Analysis Period (min)			15									

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	10	5	540	630	40
Future Volume (Veh/h)	15	10	5	540	630	40
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	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	568	663	42
Pedestrians	36					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	3					
Right turn flare (veh)						
Median type			None	None	None	None
Median storage (veh)						
Upstream signal (m)				103	262	
pX platoon unblocked	0.84	0.79	0.79			
VC, conflicting volume	1297	719	740			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	970	507	534			
IC, single (s)	6.4	6.3	4.3			
IC, 2 stage (s)						
IF (s)	3.5	3.4	2.4			
p0 queue free %	93	97	99			
CM capacity (veh/h)	229	419	723			
Direction_Lane #	EB 1	NB 1	SB 1			
Volume Total	27	573	705			
Volume Left	16	5	0			
Volume Right	11	0	42			
cSH	281	723	1700			
Volume to Capacity	0.10	0.01	0.41			
Queue Length 95th (m)	2.4	0.2	0.0			
Control Delay (s)	19.2	0.2	0.0			
Lane LOS	C	A	A			
Approach Delay (s)	19.2	0.2	0.0			
Approach LOS	C	A	A			
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			45.8%			
Analysis Period (min)			15			
ICU Level of Service						A

Timings
9: Kerr Street & Stewart Street

Future Total PM (Ultimate)
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	50	10	10	15	10	420	55	520
Traffic Volume (vph)	50	10	10	15	10	420	55	520
Future Volume (vph)	Perm	NA	Perm	NA	Perm	NA	prn+pt	NA
Turn Type	4	8	8	2	2	1	6	6
Protected Phases	4	8	8	2	2	1	6	6
Detector Phase	4	8	8	2	2	1	6	6
Switch Phase	10.0	10.0	10.0	10.0	24.0	24.0	6.0	24.0
Minimum Initial (s)	30.0	30.0	30.0	30.0	32.0	32.0	10.0	32.0
Minimum Split (s)	30.0	30.0	30.0	30.0	35.0	35.0	10.0	45.0
Total Split (s)	40.0%	40.0%	40.0%	40.0%	46.7%	46.7%	13.3%	60.0%
Total Split (%)	24.6	24.6	24.6	24.6	29.6	29.6	7.0	39.6
Maximum Green (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.0	3.3
Yellow Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	2.1
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Total Lost Time (s)	Lead/Lag	Lag	Lag	Lead	Lead	Lead	Yes	Yes
Lead/Lag	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
Lead-Lag Optimize?	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	None	None	None	C-Min	C-Min	None	C-Min	None
Recall Mode	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Walk Time (s)	13.0	13.0	13.0	13.0	14.0	14.0	14.0	14.0
Flash Dont Walk (s)	20	20	20	20	35	35	35	35
Pedestrian Calls (#/hr)	Intersection Summary							
Cycle Length: 75	Cycle Length: 75							
Actuated Cycle Length: 75	Actuated Cycle Length: 75							
Offset: 13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	Offset: 13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green							
Natural Cycle: 75	Natural Cycle: 75							
Control Type: Actuated-Coordinated	Control Type: Actuated-Coordinated							



Queues
9: Kerr Street & Stewart Street

Future Total PM (Ultimate)
Upper Kerr Village (8/24-01)

	EBT	WBT	NBT	SBT
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	81	109	484	679
v/c Ratio	0.29	0.29	0.37	0.57
Control Delay	21.6	10.0	8.1	11.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.6	10.0	8.1	11.2
Queue Length 50th (m)	8.5	3.4	20.5	35.1
Queue Length 95th (m)	16.5	13.0	60.5	106.8
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)	444	552	1299	1192
Base Capacity (vph)	0	0	0	0
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	0.18	0.20	0.37	0.57
Intersection Summary				

9: Kerr Street & Stewart Street

Future Total PM (Ultimate)

Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4
Traffic Volume (vph)	50	10	15	10	15	75	10	420	15	55	520	50
Future Volume (vph)	50	10	15	10	15	75	10	420	15	55	520	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	0.99			0.96			1.00			1.00		0.99
Fpb. ped/bikes	0.98			1.00			1.00			1.00		1.00
Ft	0.97			0.90			1.00			1.00		0.99
Flt Protected	0.97			0.99			1.00			1.00		1.00
Satd. Flow (prot)	1661			1562			1857			1803		1803
Flt Permitted	0.77			0.97			0.98			0.93		0.93
Satd. Flow (perm)	1323			1518			1831			1678		1678
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	457	16	60	565	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	483	0	0	676	0
Confl. Peds. (#/hr)	20	15	15	20	35	20	35	25	25	35	35	35
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Bus Blockages (#/hr)	0	2	0	0	2	0	0	0	0	0	3	0
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA	NA	pm-pt	NA	NA	NA
Protected Phases	4			8			2		2	1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	13.2			13.2			51.0		51.0	51.0		51.0
Effective Green, g (s)	13.2			13.2			51.0		51.0	51.0		51.0
Actuated G/C Ratio	0.18			0.18			0.68		0.68	0.68		0.68
Clearance Time (s)	5.4			5.4			5.4		5.4	5.4		5.4
Vehicle Extension (s)	4.0			4.0			4.0		4.0	4.0		4.0
Lane Grp Cap. (vph)	232			267			1245		1245	1141		1141
v/s Ratio Prot												
v/s Ratio Perm	c0.05			0.03			0.26		0.26	c0.40		c0.40
v/c Ratio	0.29			0.16			0.39		0.39	0.59		0.59
Uniform Delay, d1	26.8			26.2			5.2		5.2	6.4		6.4
Progression Factor	1.00			1.00			1.00		1.00	1.00		1.00
Incremental Delay, d2	1.0			0.4			0.9		0.9	0.8		0.8
Delay (s)	27.8			26.5			6.1		6.1	7.3		7.3
Level of Service	C			C			A		A	A		A
Approach Delay (s)	27.8			26.5			6.1		6.1	7.3		7.3
Approach LOS	C			C			A		A	A		A
Intersection Summary												
HCM 2000 Control Delay				9.6			HCM 2000 Level of Service		A			A
HCM 2000 Volume to Capacity ratio				0.56								
Actuated Cycle Length (s)				75.0			Sum of lost time (s)		13.8			
Intersection Capacity Utilization				82.5%			ICU Level of Service		E			
Analysis Period (min)				15								
c Critical Lane Group												

10: Donval Road & Wyecroft Road

Future Total PM (Ultimate)

Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	4	4	4	4	4	4	4	4	4
Traffic Volume (vph)	385	225	60	95	495	95	1315	140	1170
Future Volume (vph)	385	225	60	95	495	95	1315	140	1170
Turn Type	Prot	NA	pm-pt	NA	pm+ov	pm-pt	NA	Prot	NA
Protected Phases	7	4	3	8	1	5	2	1	6
Permitted Phases	7	4	3	8	1	5	2	1	6
Detector Phase									
Switch Phase									
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	7.0	20.0	7.0	20.0
Minimum Split (s)	12.0	25.0	12.0	25.0	12.0	12.0	41.0	12.0	41.0
Total Split (s)	21.0	40.0	21.0	40.0	17.0	17.0	42.0	17.0	42.0
Total Split (%)	17.5%	33.3%	17.5%	33.3%	14.2%	14.2%	35.0%	14.2%	35.0%
Maximum Green (s)	16.0	33.0	16.0	33.0	12.0	12.0	35.0	12.0	35.0
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	3.0	4.0	3.0	4.0
All-Red Time (s)	2.0	3.0	2.0	3.0	2.0	2.0	3.0	2.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	5.0	7.0	5.0	5.0	7.0	5.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Gap (s)	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
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	None	None	C-Min
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	27.0	11.0	27.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0
Intersection Summary									
Cycle Length: 120									
Actuated Cycle Length: 120									
Offset: 103 (86%), Referenced to phase 2:NETL and 6:SBT, Start of Green									
Natural Cycle: 90									
Control Type: Actuated-Coordinated									
Splits and Phases:	10: Donval Road & Wyecroft Road								
Ø1	Ø2 (R)	Ø3	Ø4	Ø5	Ø6 (R)	Ø7	Ø8		
17 s	42 s	21 s	40 s	17 s	42 s	21 s	40 s		
17 s	42 s	21 s	40 s	17 s	42 s	21 s	40 s		

Queues
10: Dorval Road & Wynecroft Road

Future Total PM (Ultimate)
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group	418	430	65	103	538	103	1472	152	1500
Lane Group Flow (vph)	0.98	0.57	0.22	0.47	0.88	0.43	0.88	0.21	0.67
v/c Ratio	90.1	31.3	29.9	54.9	45.4	15.2	40.4	39.9	28.3
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	90.1	31.3	29.9	54.9	45.4	15.2	40.4	39.9	28.3
Total Delay	51.2	31.8	10.9	23.0	91.9	8.3	135.6	14.8	95.5
Queue Length 50th (m)	#82.7	46.3	19.4	37.7	#131.7	m11.8	#157.5	25.2	134.0
Queue Length 95th (m)	155.6		199.3			494.4		672.1	
Internal Link Dist (m)	115.0		145.0		65.0		125.0		
Turn Bay Length (m)	428	1001	372	474	610	261	1679	728	2252
Base Capacity (vph)	0	0	0	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.43	0.17	0.22	0.88	0.39	0.88	0.21	0.67

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
10: Dorval Road & Wynecroft Road

Future Total PM (Ultimate)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	TT	TT	F	F	F	TT	TT	TT	TT	TT
Traffic Volume (vph)	385	225	170	60	95	495	95	1315	40	140
Future Volume (vph)	385	225	170	60	95	495	95	1315	40	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00	0.91	0.87	0.91	0.91
Fpb. ped/bikes	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Fibb. 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	0.94	1.00	1.00	0.85	1.00	1.00	1.00	0.98	0.98
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	3213	3233	1783	1727	1590	1736	5041	3502	4972	3502
Flt Permitted	0.95	1.00	0.50	1.00	1.00	0.13	1.00	0.95	1.00	0.95
Satd. Flow (perm)	3213	3233	942	1727	1590	233	5041	3502	4972	3502
Peak-Hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	418	245	185	65	103	538	103	1429	43	152
RTOR Reduction (vph)	0	126	0	0	0	54	0	3	0	0
Lane Group Flow (vph)	418	304	0	65	103	484	103	1469	0	152
Confl. Peds. (#/hr)	1	4	4	4	4	1	1	1	1	1
Heavy Vehicles (%)	9%	4%	2%	1%	10%	1%	4%	2%	2%	0%
Bus Blockages (#/hr)	0	2	0	0	0	0	3	0	0	0
Turn Type	Prot	NA	NA	pm-pt	NA	pm-ov	pm-pt	NA	Prot	NA
Protected Phases	7	4	3	8	1	5	2	1	6	6
Permitted Phases			8		8		2			
Actuated Green, G (s)	16.0	23.1	25.1	16.1	41.1	49.8	38.9	25.0	53.0	53.0
Effective Green, g (s)	16.0	23.1	25.1	16.1	41.1	49.8	38.9	25.0	53.0	53.0
Actuated G/C Ratio	0.13	0.19	0.21	0.13	0.34	0.41	0.32	0.21	0.44	0.44
Clearance Time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	5.0	7.0	7.0
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	428	622	260	231	544	233	1634	729	2195	2195
v/s Ratio Prot	c0.13	0.09	0.02	0.06	c0.19	0.04	c0.29	0.04	0.30	0.30
v/s Ratio Perm			0.03		0.12		0.14			
v/c Ratio	0.98	0.49	0.25	0.45	0.89	0.44	0.90	0.21	0.68	0.68
Uniform Delay, d1	51.8	43.2	38.9	47.8	37.3	22.3	38.7	39.3	26.7	26.7
Progression Factor	1.00	1.00	1.00	1.00	0.82	0.94	1.00	1.00	1.00	1.00
Incremental Delay, d2	37.4	1.3	1.1	2.9	17.3	1.5	4.8	0.3	1.7	1.7
Delay (s)	89.2	44.5	40.0	50.7	54.7	19.7	41.1	39.6	28.4	28.4
Level of Service	F	D	D	D	D	B	D	D	C	C
Approach Delay (s)										
Approach LOS		E				D			C	C

Intersection Summary
HCM 2000 Control Delay 42.8 HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio 0.91
Actuated Cycle Length (s) 120.0 Sum of lost time (s) 24.0
Intersection Capacity Utilization 84.2% ICU Level of Service E
Analysis Period (min) 15
c Critical Lane Group

1: Kerr Street & Wycroft Road

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	5	85	190	315	470	125
Traffic Volume (veh/h)	5	85	190	315	470	125
Future Volume (Veh/h)	5	85	190	315	470	125
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	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	335	500	133
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	None
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	1138	316	633			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	1138	316	633			
IC, single (s)	6.8	7.0	4.1			
IC, 2 stage (s)	3.5	3.3	2.2			
p0 queue free %	97	87	79			
CM capacity (veh/h)	156	676	946			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	5	90	202	168	333	300
Volume Left	5	0	202	0	0	0
Volume Right	0	90	0	0	0	133
cSH	156	676	946	1700	1700	1700
Volume to Capacity	0.03	0.13	0.21	0.10	0.10	0.20
Queue Length 95th (m)	0.8	3.5	6.1	0.0	0.0	0.0
Control Delay (s)	28.9	11.1	9.8	0.0	0.0	0.0
Lane LOS	D	B	A			
Approach Delay (s)	12.1		3.7			0.0
Approach LOS	B					
Intersection Summary						
Average Delay	2.5					
Intersection Capacity Utilization	40.8%					
Analysis Period (min)	15					
ICU Level of Service	A					

2: Kerr Street & Shepherd Road

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

Lane Group	WBL	WBT	NBT	NBR	SBL	SBT	Ø4
Lane Configurations	115	0	280	70	90	410	
Traffic Volume (vph)	115	0	280	70	90	410	
Future Volume (vph)	115	0	280	70	90	410	
Turn Type	pm+pt	NA	NA	Perm	pm+pt	NA	
Protected Phases	3	8	2		1	6	4
Permitted Phases	8		2	2	6		
Detector Phase	3	8	2	2	1	6	
Switch Phase							
Minimum Initial (s)	5.0	5.0	18.0	18.0	7.0	18.0	5.0
Minimum Split (s)	9.0	22.0	28.2	28.2	11.0	28.2	22.0
Total Split (s)	20.0	51.0	42.0	42.0	15.0	57.0	31.0
Total Split (%)	18.5%	47.2%	38.9%	38.9%	13.9%	52.8%	29%
Maximum Green (s)	16.0	47.0	36.8	36.8	11.0	51.8	27.0
Yellow Time (s)	3.0	3.0	3.3	3.3	4.0	3.3	3.0
All-Red Time (s)	1.0	1.0	1.9	1.9	0.0	1.9	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	5.2	5.2	4.0	5.2	4.0
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.5	3.5	2.5	3.5	3.0
Minimum Gap (s)	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
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	Min	Min	None	Min	None
Walk Time (s)	7.0	10.0	10.0	10.0	10.0	7.0	
Flash Dont Walk (s)	11.0	13.0	13.0	13.0	13.0	11.0	
Pedestrian Calls (#/hr)	0	5	5	5	5	0	
Intersection Summary							
Cycle Length	108						
Actuated Cycle Length	45.6						
Natural Cycle	75						
Control Type	Semi Ad-Uncooord						
Splits and Phases	2: Kerr Street & Shepherd Road						
	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø8
	55 s	42 s	20 s	31 s	57 s	51 s	

Queues
2: Kerr Street & Shepherd Road

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group	126	236	308	77	99	451
Lane Group Flow (vph)	0.40	0.34	0.21	0.11	0.14	0.21
v/c Ratio	21.8	1.3	10.0	2.8	3.9	4.4
Control Delay	0.0	0.0	0.0	0.0	0.7	0.1
Queue Delay	21.8	1.3	10.0	2.8	4.7	4.5
Total Delay	9.3	0.0	8.5	0.0	2.4	6.7
Queue Length 50th (m)	23.0	0.0	16.3	4.9	6.8	13.4
Queue Length 95th (m)	241.3	143.2				21.4
Internal Link Dist (m)				50.0	50.0	
Turn Bay Length (m)	603	1513	2818	1218	780	3465
Base Capacity (vph)	0	0	0	0	473	1599
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 v/c Ratio	0.21	0.16	0.11	0.06	0.32	0.24
Intersection Summary						

HCM Signalized Intersection Capacity Analysis
2: Kerr Street & Shepherd Road

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Traffic Volume (vph)	0	0	0	115	0	215	0	280	70	90	410	0
Future Volume (vph)	0	0	0	115	0	215	0	280	70	90	410	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0			5.2	5.2	4.0	5.2	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Fpb. ped/bikes				1.00	0.97			1.00	0.97	1.00	1.00	
Fpb. ped/bikes				1.00	1.00			1.00	1.00	1.00	1.00	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1664	1559			3497	1499	1785	3505	
Flt Permitted				0.73	1.00			1.00	1.00	0.47	1.00	
Satd. Flow (perm)				1274	1559			3497	1499	879	3505	
Peak-Hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	126	0	236	0	308	77	99	451	0
RTOR Reduction (vph)	0	0	0	0	178	0	0	0	47	0	0	0
Lane Group Flow (vph)	0	0	0	126	58	0	0	308	30	99	451	0
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	0%	0%	0%	8%	0%	0%	0%	2%	5%	1%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	2	0	0	6	0	0	0	0
Turn Type	Perm	Perm	pm-pt	NA	NA	Perm	NA	NA	Perm	pm-pt	NA	Perm
Protected Phases		3	8				2			1		6
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	12.4	12.4	12.4	12.4	12.4	12.4	19.4	19.4	19.4	28.7	28.7	28.7
Effective Green, g (s)	12.4	12.4	12.4	12.4	12.4	12.4	19.4	19.4	19.4	28.7	28.7	28.7
Actuated g/C Ratio	0.25	0.25	0.25	0.39	0.39	0.39	0.39	0.39	0.39	0.57	0.57	0.57
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.2	5.2	4.0	5.2	5.2	5.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.5	3.5	3.5	2.5	3.5	3.5
Lane Grp Cap (vph)	367	384		367	384		1348	578	597	1999		
v/s Ratio Prot	c0.05	0.04		c0.05	0.04		0.09	0.02	0.08	c0.13		
v/s Ratio Perm	c0.04			c0.04			0.02	0.08				
v/c Ratio	0.34	0.15		0.34	0.15		0.23	0.05	0.17	0.23		
Uniform Delay, d1	15.5	14.8		15.5	14.8		10.4	9.7	5.1	5.3		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00		
Incremental Delay, d2	0.6	0.2		0.6	0.2		0.1	0.0	0.1	0.1		
Delay (s)	16.0	15.0		16.0	15.0		10.5	9.7	5.2	5.4		
Level of Service	B	B		B	B		B	A	A	A		
Approach Delay (s)	0.0			15.4			10.4			5.4		
Approach LOS	A			B			B			A		
Intersection Summary												
HCM 2000 Control Delay				9.6			HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio				0.32								
Actuated Cycle Length (s)				50.3			Sum of lost time (s)			17.2		
Intersection Capacity Utilization				56.0%			ICU Level of Service			B		
Analysis Period (min)				15								
c. Critical Lane Group												

Timings
3: Kerr Street & Speers Road

Queues
3: Kerr Street & Speers Road

Future Total AM (Phase 1)
 Upper Kerr Village (8/24-01)

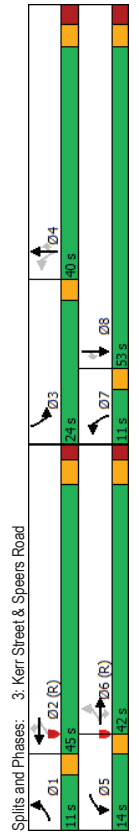
Future Total AM (Phase 1)
 Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	7	7	7	7	7	7	7	7	7	7	7
Traffic Volume (vph)	70	735	95	195	560	165	105	115	370	325	145	95
Future Volume (vph)	70	735	95	195	560	165	105	115	370	325	145	95
Turn Type	pm-pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	6	6	2	2	2	4	4	4	3	8	8
Permitted Phases	1	6	6	2	2	2	4	4	4	3	8	8
Detector Phase												
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
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
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	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	14.0	14.0
Pedestrian Calls (#/hr)	15	15	15	15	15	15	15	35	35	35	35	35

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	81	855	110	227	651	192	122	134	430	378	169	110
v/c Ratio	0.22	0.75	0.20	0.75	0.46	0.26	0.29	0.30	0.91	0.76	0.28	0.19
Control Delay	16.1	33.9	5.0	38.0	23.7	5.0	21.0	37.5	49.6	59.2	29.5	5.2
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	16.1	33.9	5.0	38.0	23.7	5.0	21.0	37.5	49.6	59.2	29.5	5.2
Queue Length 50th (m)	6.8	102.9	1.6	31.7	63.2	0.0	15.8	24.9	61.0	44.3	28.0	0.0
Queue Length 95th (m)	15.0	123.0	6.4	#68.1	80.8	13.6	24.1	39.1	#97.0	56.1	40.3	9.7
Internal Link Dist (m)	145.3			474.4			103.4				143.2	
Turn Bay Length (m)	105.0		75.0	75.0		100.0	50.0		45.0	80.0		75.0
Base Capacity (vph)	377	1145	561	303	1410	726	419	519	524	583	718	655
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	0.21	0.75	0.20	0.75	0.46	0.26	0.29	0.26	0.82	0.65	0.24	0.17

Intersection Summary
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

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



3: Kerr Street & Speers Road

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	7	7	7	7	7	7	7	7	7	7	7
Traffic Volume (vph)	70	735	95	195	560	165	105	115	370	325	145	95
Future Volume (vph)	70	735	95	195	560	165	105	115	370	325	145	95
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	0.97	1.00	1.00	0.95
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95
Satd. Flow (prot)	1799	3378	1437	1687	3438	1495	1674	1844	1429	3335	1845	1511
Flt Permitted	0.37	1.00	1.00	0.15	1.00	1.00	0.65	1.00	1.00	0.85	1.00	1.00
Satd. Flow (perm)	710	3378	1437	271	3438	1495	1146	1844	1429	3335	1845	1511
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	81	855	110	227	651	192	122	134	430	378	169	110
RTOR Reduction (vph)	0	0	73	0	0	114	0	0	129	0	0	74
Lane Group Flow (vph)	81	855	37	227	651	78	122	134	301	378	169	36
Confl. Peds. (#/hr)	15	10	10	7	15	20	15	20	35	35	20	20
Heavy Vehicles (%)	0%	6%	7%	7%	5%	4%	6%	1%	5%	5%	3%	2%
Bus Blockages (#/hr)	0	4	0	0	0	0	0	5	0	0	0	0
Turn Type	pm-pt	NA	Perm	pm-pt	NA	Perm	pm-pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	6	5	2	2	7	4	4	3	8	8	8
Permitted Phases	6	6	2	2	4	4	4	4	4	4	4	4
Actuated Green, G (s)	46.9	40.7	40.7	57.8	48.6	48.6	36.9	29.1	29.1	17.9	39.2	39.2
Effective Green, g (s)	46.9	40.7	40.7	57.8	48.6	48.6	36.9	29.1	29.1	17.9	39.2	39.2
Actuated G/C Ratio	0.39	0.34	0.34	0.48	0.41	0.41	0.31	0.24	0.24	0.15	0.33	0.33
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	1145	487	296	1392	605	386	447	346	497	602	493
v/s Ratio Prot	0.01	0.25	0.03	c0.09	0.19	0.02	0.02	0.07	c0.11	0.09	0.02	0.02
v/s Ratio Perm	0.08	0.24	0.08	0.28	0.13	0.05	0.08	0.32	0.30	0.87	0.76	0.28
v/s Ratio	0.24	0.75	0.08	0.77	0.47	0.13	0.32	0.30	0.87	0.76	0.28	0.07
Uniform Delay, d1	23.4	35.1	26.9	22.4	26.2	22.4	31.0	37.1	43.6	49.0	29.9	27.9
Progression Factor	0.80	0.80	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	4.3	0.3	10.8	1.1	0.4	0.3	0.5	21.0	6.5	0.3	0.1
Delay (s)	19.0	32.4	20.5	33.2	27.3	22.8	31.4	37.6	64.7	55.5	30.3	28.0
Level of Service	B	C	C	C	C	C	C	D	E	E	C	C
Approach Delay (s)	30.1	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8
Approach LOS	C	C	C	C	C	C	C	D	D	D	D	D
Intersection Summary												
HCM 2000 Control Delay	36.7 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	72.4% ICU Level of Service											
Analysis Period (min)	15											
c Critical Lane Group												

4: Dorval Road & Speers Road

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	
Traffic Volume (vph)	415	580	40	75	390	285	70	830	275	525	255	
Future Volume (vph)	415	580	40	75	390	285	70	830	275	525	255	
Turn Type	Prot	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	pm+pt	NA	Perm	
Protected Phases	7	4	4	3	8	8	2	1	5	2	6	
Permitted Phases	7	4	4	3	8	8	1	5	2	1	6	
Detector Phase	7	4	4	3	8	8	1	5	2	1	6	
Switch Phase	7	4	4	3	8	8	1	5	2	1	6	
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	7.0	20.0	20.0	
Minimum Split (s)	11.0	42.0	42.0	11.0	42.0	11.0	11.0	40.0	11.0	40.0	40.0	
Total Split (s)	21.0	50.0	50.0	13.0	42.0	12.0	11.0	45.0	12.0	46.0	46.0	
Total Split (%)	17.5%	41.7%	41.7%	10.8%	35.0%	10.0%	9.2%	37.5%	10.0%	38.3%	38.3%	
Maximum Green (s)	17.0	43.0	43.0	9.0	35.0	8.0	7.0	38.0	8.0	39.0	39.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	3.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	1.0	1.0	3.0	1.0	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	
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0	
Minimum Gap (s)	3.0	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	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	0.0	
Recall Mode	None	None	None	None	None	None	None	C-Min	None	C-Min	C-Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	
Pedestrian Calls (#/hr)	5	5	5	5	5	5	5	5	5	5	5	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 41 (34%), Referenced to phase 2:NBLT and 6:SBTL, Start of Green												
Natural Cycle: 125												
Control Type: Actuated-Coordinated												
Splits and Phases: 4: Dorval Road & Speers Road												

Queues
4: Dorval Road & Speers Road

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group	451	630	43	82	424	310	76	1043	299	571	277
Lane Group Flow (vph)	0.94	0.64	0.08	0.31	0.64	0.49	0.19	0.94	0.93	0.38	0.36
v/c Ratio	79.4	40.1	0.3	17.2	35.9	9.9	17.8	56.5	60.9	10.5	3.1
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	79.4	40.1	0.3	17.2	35.9	9.9	17.8	56.5	60.9	10.5	3.1
Queue Length 50th (m)	54.8	71.4	0.0	5.2	33.2	18.6	8.3	123.9	30.4	35.4	10.1
Queue Length 95th (m)	#85.1	79.0	0.0	7.8	42.6	34.2	19.6	#165.4	#141.0	45.6	16.4
Internal Link Dist (m)	412.3			472.1			621.6		494.4		
Turn Bay Length (m)	60.0		60.0	85.0		55.0	70.0		110.0		
Base Capacity (vph)	481	1192	600	276	949	639	383	1111	321	1503	761
Stavation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.53	0.07	0.30	0.45	0.49	0.19	0.94	0.93	0.38	0.36
Intersection Summary											
#	95th percentile volume exceeds capacity, queue may be longer.										
	Queue shown is maximum after two cycles.										

HCM Signalized Intersection Capacity Analysis
4: Dorval Road & Speers Road

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Movement	441	441	441	441	441	441	441	441	441	441	441
Lane Configurations	415	580	40	75	390	285	70	830	130	275	525
Traffic Volume (vph)	415	580	40	75	390	285	70	830	130	275	525
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.0	7.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0
Total Lost time (s)	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	0.98
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fibb. ped/bikes	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	3329	1482	1656	3256	1494	1785	3477	1687	3539	1417
Flt Permitted	0.95	1.00	1.00	0.38	1.00	1.00	0.44	1.00	0.10	1.00	1.00
Satd. Flow (perm)	3400	3329	1482	660	3256	1494	822	3477	172	3539	1417
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
Adj. Flow (vph)	451	630	43	82	424	310	76	902	141	299	277
RTOR Reduction (vph)	0	0	30	0	0	0	69	0	10	0	0
Lane Group Flow (vph)	451	630	13	82	424	241	76	1033	0	299	571
Confl. Peds. (#/hr)	5			5			5		5		5
Heavy Vehicles (%)	3%	2%	0%	9%	10%	7%	1%	2%	0%	7%	2%
Bus Blockages (#/hr)	0	2	0	0	4	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm-pt	NA	pm-pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2	1	6	
Permitted Phases			4			8		2			6
Actuated Green, G (s)	17.0	35.4	35.4	32.4	25.4	43.8	43.4	37.2	59.6	49.4	49.4
Effective Green, g (s)	17.0	35.4	35.4	32.4	25.4	43.8	43.4	37.2	58.6	49.4	49.4
Actuated g/C Ratio	0.14	0.29	0.29	0.27	0.21	0.36	0.36	0.31	0.50	0.41	0.41
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0
Lane Grp Cap (vph)	481	982	437	236	689	545	347	1077	317	1456	583
v/s Ratio Prot	c0.13	c0.19		0.02	0.13	0.07	0.01	0.30	c0.14	0.16	
v/s Ratio Perm			0.01	0.07	0.09	0.07			c0.32		0.08
v/c Ratio	0.94	0.64	0.03	0.35	0.62	0.44	0.22	0.96	0.94	0.39	0.20
Uniform Delay, d1	51.0	36.8	30.1	33.7	42.9	28.8	25.5	40.6	35.7	24.8	22.6
Progression Factor	1.00	1.00	1.00	0.67	0.74	0.46	1.00	1.00	0.97	0.39	0.61
Incremental Delay, d2	26.0	2.0	0.1	0.9	2.3	0.6	0.3	19.1	29.5	0.6	0.6
Delay (s)	76.9	38.8	30.1	23.3	33.9	13.8	25.9	59.8	64.0	10.1	14.3
Level of Service	E	D	C	C	C	B	C	E	E	B	B
Approach Delay (s)		53.7		25.2		57.5		25.2		53.7	
Approach LOS		D		C		E		C		C	
Intersection Summary											
HCM 2000 Control Delay	41.4										
HCM 2000 Volume to Capacity ratio	0.90										
Actuated Cycle Length (s)	120.0										
Intersection Capacity Utilization	86.1%										
Analysis Period (min)	15										
c. Critical Lane Group	E										

Timings
5. St. Augustine Drive & Speers Road

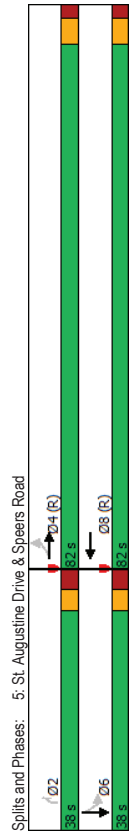
Queues
5. St. Augustine Drive & Speers Road

Future Total AM (Phase 1)
Upper Kerr Village (8724-01)

Future Total AM (Phase 1)
Upper Kerr Village (8724-01)

Lane Group	EBL	EBT	WBT	NBR	Ø6
Lane Configurations	5	4	4	2	Ø6
Traffic Volume (vph)	5	870	785	20	
Future Volume (vph)	5	870	785	20	
Turn Type	Perm	NA	NA	Perm	6
Protected Phases		4	8		
Permitted Phases	4			2	
Detector Phase	4	4	8	2	
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.9	23.9	23.9	24.3	24.3
Total Split (s)	82.0	82.0	82.0	38.0	38.0
Total Split (%)	68.3%	68.3%	68.3%	31.7%	32%
Maximum Green (s)	76.1	76.1	76.1	31.7	31.7
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.2	2.2	2.2	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.9	5.9	6.3	6.3
Lead/Lag					
Lead-Lag Optimize?					
Vehicle Extension (s)	3.0	3.0	3.0	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	C-Min	C-Min	C-Min	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 51 (43%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated



Lane Group	EBL	EBT	WBT	NBR
Lane Group Flow (vph)	6	1006	909	23
v/c Ratio	0.01	0.32	0.29	0.11
Control Delay	1.6	1.4	4.5	1.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	1.6	1.4	4.5	1.1
Queue Length 50th (m)	0.2	16.4	48.0	0.0
Queue Length 95th (m)	m0.3	m20.3	55.4	0.0
Internal Link Dist (m)		472.1	42.5	
Turn Bay Length (m)	50.0			
Base Capacity (vph)	542	3124	3122	514
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	0.01	0.32	0.29	0.04

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

5. St. Augustine Drive & Speers Road

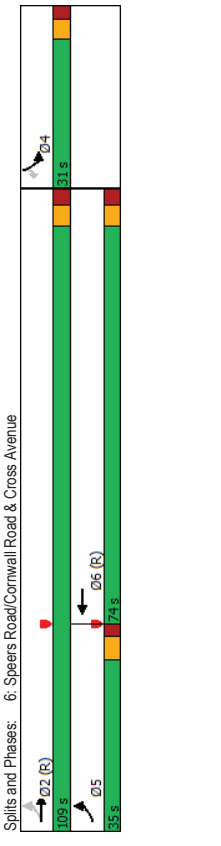
6. Speers Road/Cornwall Road & Cross Avenue

Future Total AM (Phase 1)
Upper Kerr Village (8/7/24-01)

Future Total AM (Phase 1)
Upper Kerr Village (8/7/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	870	15	0	785	15	0	0	20	0	0	0
Traffic Volume (vph)	5	870	15	0	785	15	0	0	20	0	0	0
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	5.9	5.9	5.9	5.9	5.9	5.9	6.3					
Total Lost time (s)	1.00	0.95	1.00	1.00	0.95	1.00	1.00					
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00					
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00					
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.86					
Ft	1.00	1.00	1.00	1.00	1.00	1.00	1.00					
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	1.00					
Satd. Flow (prot)	1796	3430	3426	3426	3426	3426	1565					
Flt Permitted	0.31	1.00	1.00	1.00	1.00	1.00	1.00					
Satd. Flow (perm)	593	3430	3426	3426	3426	3426	1565					
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	6	989	17	0	892	17	0	0	23	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	22	0	0	0
Lane Group Flow (vph)	6	1006	0	0	909	0	0	0	1	0	0	0
Confl. Peds. (#/hr)	5	5	5	5	5	5	5					
Heavy Vehicles (%)	0%	5%	0%	0%	5%	5%	0%	0%	5%	0%	0%	0%
Turn Type	Perm	NA	NA	NA	NA	NA	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	4						8					6
Permitted Phases	4						2		6			
Actuated Green, G (s)	104.5	104.5	104.5	104.5	104.5	104.5	3.3					
Effective Green, g (s)	104.5	104.5	104.5	104.5	104.5	104.5	3.3					
Actuated G/C Ratio	0.87	0.87	0.87	0.87	0.87	0.87	0.03					
Clearance Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	6.3					
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0					
Lane Grp Cap (vph)	516	2986			2983		43					
v/s Ratio Prot	c0.29				0.27							
v/s Ratio Perm	0.01				c0.00							
v/c Ratio	0.01	0.34			0.30		0.01					
Uniform Delay, d1	1.0	1.4			1.4		56.8					
Progression Factor	1.18	0.98			3.50		1.00					
Incremental Delay, d2	0.0	0.2			0.3		0.1					
Delay (s)	1.2	1.6			5.0		56.9					
Level of Service	A	A			A		E					
Approach Delay (s)	1.6	5.0			5.0		56.9					0.0
Approach LOS	A	A			A		E					A
Intersection Summary												
HCM 2000 Control Delay	3.9 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.33											
Actuated Cycle Length (s)	120.0 Sum of lost time (s)											
Intersection Capacity Utilization	38.9% ICU Level of Service											
Analysis Period (min)	15											
c Critical Lane Group												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	870	15	0	785	15	0	0	20	0	0	0
Traffic Volume (vph)	205	1220	605	5	245							
Future Volume (vph)	205	1220	605	5	245							
Turn Type	pm-prot	NA	NA	NA	Prot	Perm						
Protected Phases	5	2	6	4								
Permitted Phases	5	2	6	4								
Detector Phase	5	2	6	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%	59.9%	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												



Queues
 6: Speers Road/Cornwall Road & Cross Avenue
 Future Total AM (Phase 1)
 Upper Kerr Village (8724-01)

	EBL	EBT	WBT	SBL	SBR
Lane Group	241	1435	736	6	288
Lane Group Flow (vph)	0.42	0.49	0.29	0.05	0.63
v/c Ratio	4.3	3.9	7.2	60.6	12.9
Control Delay	0.0	0.0	0.0	0.0	0.0
Queue Delay	4.3	3.9	7.2	60.6	12.9
Total Delay	9.4	44.7	33.1	1.6	0.0
Queue Length 50th (m)	14.5	53.4	43.1	5.7	11.7
Queue Length 95th (m)	47.4	77.5	60.0		
Internal Link Dist (m)	80.0		45.0		
Turn Bay Length (m)	729	2905	2501	324	705
Base Capacity (vph)	0	0	0	0	0
Station 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	0.33	0.49	0.29	0.02	0.41
Intersection Summary					

HCM Signalized Intersection Capacity Analysis
 6: Speers Road/Cornwall Road & Cross Avenue
 Future Total AM (Phase 1)
 Upper Kerr Village (8724-01)

	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔
Traffic Volume (vph)	205	1220	605	20	5
Future Volume (vph)	205	1220	605	20	5
Ideal Flow (vphpl)	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
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00
Fpb. 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)	1686	3471	3450	1805	2608
Flt Permitted	0.34	1.00	1.00	0.95	1.00
Satd. Flow (perm)	589	3471	3450	1805	2608
Peak-Hour factor, PHF	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	241	1435	712	24	6
RTOR Reduction (vph)	0	0	1	0	0
Lane Group Flow (vph)	241	1435	735	0	6
Confl. Peds. (#/hr)	5		5		
Heavy Vehicles (%)	7%	4%	4%	5%	9%
Turn Type	pm>pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2			4	
Actuated Green, G (s)	117.2	117.2	101.5	10.4	10.4
Effective Green, g (s)	117.2	117.2	101.5	10.4	10.4
Actuated g/C Ratio	0.84	0.84	0.72	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)	576	2905	2501	134	193
v/s Ratio Prot	0.03	c0.41	0.21	0.00	
v/c Ratio Perm	0.32			c0.01	
v/c Ratio	0.42	0.49	0.29	0.04	0.11
Uniform Delay, d1	2.7	3.2	6.7	60.2	60.5
Progression Factor	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.6	0.3	0.1	0.3
Delay (s)	3.3	3.8	7.0	60.3	60.7
Level of Service	A	A	A	E	E
Approach Delay (s)	3.7	7.0	60.7		
Approach LOS	A	A	E		
Intersection Summary					
HCM 2000 Control Delay	10.8		HCM 2000 Level of Service		
HCM 2000 Volume to Capacity ratio	0.49		B		
Actuated Cycle Length (s)	140.0		Sum of lost time (s)		
Intersection Capacity Utilization	69.2%		ICU Level of Service		
Analysis Period (min)	15		C		
c Critical Lane Group					

7: Kerr Street & Prince Charles Drive HCM Unsignalized Intersection Capacity Analysis Future Total AM (Phase 1) Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	5	5	0	40	5	545	5	40	380	5
Future Volume (Veh/h)	5	0	5	5	0	40	5	545	5	40	380	5
Sign Control	Stop	0%	Stop	0%	0%	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	6	0	6	6	0	48	6	649	6	48	452	6
Pedestrians	15			30								
Lane Width (m)	3.6			3.6								
Walking Speed (m/s)	1.1			1.1								
Percent Blockage	1			3								
Right turn flare (veh)												
Median type							None	None	None	None	None	None
Median storage (veh)												
Upstream signal (m)							238					127
pX platoon unblocked	0.91	0.91	0.85	0.91	0.91	0.87	0.85			0.87		
VC, conflicting volume	1278	1263	470	1251	1263	682	473			685		
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	949	933	291	920	933	565	295			568		
IC, single (s)	7.1	6.5	6.5	7.1	6.5	6.3	4.3			4.2		
IC, 2 stage (s)												
p0 queue free %	3.5	4.0	3.6	3.5	4.0	3.4	2.3			2.3		
IF (s)	97	100	99	97	100	89	99			94		
CM capacity (veh/h)	179	221	572	206	221	434	1001			833		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	EB 1	NB 1	SB 1					
Volume Total	12	54	661	506								
Volume Left	6	6	6	48								
Volume Right	6	48	6	6								
cSH	273	386	1001	833								
Volume to Capacity	0.04	0.14	0.01	0.06								
Queue Length 95th (m)	1.0	3.7	0.1	1.4								
Control Delay (s)	18.8	15.8	0.2	1.6								
Lane LOS	C	C	A	A								
Approach Delay (s)	18.8	15.8	0.2	1.6								
Approach LOS	C	C	A	A								
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			57.1%									B
Analysis Period (min)			15									

8: Kerr Street & Elmwood Road HCM Unsignalized Intersection Capacity Analysis Future Total AM (Phase 1) Upper Kerr Village (8/24-01)

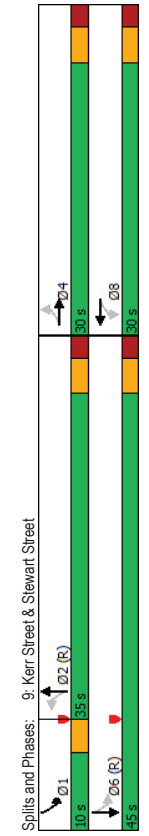
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	10	5	525	350	30
Future Volume (Veh/h)	20	10	5	525	350	30
Sign Control	Stop	0%	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	24	12	6	618	412	35
Pedestrians	20					5
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	2			0		
Right turn flare (veh)						
Median type				None	None	None
Median storage (veh)						
Upstream signal (m)				103	262	
pX platoon unblocked	0.89	0.93	0.93			
VC, conflicting volume	1080	454	467			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	846	374	387			
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
p0 queue free %	3.5	3.3	2.2			
IF (s)	92	98	99			
CM capacity (veh/h)	291	614	1078			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	36	624	447			
Volume Left	24	6	0			
Volume Right	12	0	35			
cSH	353	1078	1700			
Volume to Capacity	0.10	0.01	0.26			
Queue Length 95th (m)	2.6	0.1	0.0			
Control Delay (s)	16.4	0.2	0.0			
Lane LOS	C	A	A			
Approach Delay (s)	16.4	0.2	0.0			
Approach LOS	C	A	A			
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			43.2%			
Analysis Period (min)			15			
ICU Level of Service						A

Timings
9: Kerr Street & Stewart Street

Future Total AM (Phase 1)
Upper Kerr Village (8724-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	4	4	8	8	2	2	1	6
Traffic Volume (vph)	35	25	20	35	5	420	40	280
Future Volume (vph)	35	25	20	35	5	420	40	280
Turn Type	Perm	NA	Perm	NA	Perm	NA	prn+pt	NA
Protected Phases	4		8		2		1	6
Permitted Phases	4	4	8	8	2	2	1	6
Detector Phase								
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	0.0	0.0
Total Lost Time (s)	5.4	5.4	5.4	5.4	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:NBT and 6:SBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated



Queues
9: Kerr Street & Stewart Street

Future Total AM (Phase 1)
Upper Kerr Village (8724-01)

	EBT	WBT	NBT	SBT
Lane Group	79	152	542	427
Lane Group Flow (vph)	0.28	0.40	0.47	0.42
v/c Ratio	23.8	14.2	9.6	9.0
Control Delay	0.0	0.0	0.0	0.0
Queue Delay	23.8	14.2	9.6	9.0
Total Delay	9.6	8.7	24.6	18.0
Queue Length 50th (m)	15.4	16.8	61.6	47.8
Queue Length 95th (m)	71.6	36.6	141.0	79.0
Internal Link Dist (m)				
Turn Bay Length (m)	459	559	1156	1028
Base Capacity (vph)	0	0	0	0
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	0.17	0.27	0.47	0.42

Intersection Summary

9: Kerr Street & Stewart Street

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	35	25	5	20	35	70	5	420	20	40	280	30
Traffic Volume (vph)	35	25	5	20	35	70	5	420	20	40	280	30
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpt)	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Frb. ped/bikes	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Flt Protected	1701	1612	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775
Satd. Flow (prot)	0.79	0.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Permitted	1388	1532	1769	1769	1769	1769	1769	1769	1769	1769	1769	1769
Satd. Flow (perm)	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Peak-hour factor, PHF	43	30	6	24	43	85	6	512	24	49	341	37
Adj. Flow (vph)	0	5	0	0	68	0	0	1	0	0	3	0
RTOR Reduction (vph)	0	74	0	0	84	0	0	541	0	0	424	0
Lane Group Flow (vph)	20	20	20	20	20	30	30	35	35	35	30	30
Confl. Peds. (#/hr)	2%	7%	16%	0%	5%	4%	28%	6%	0%	2%	6%	6%
Heavy Vehicles (%)	0	2	0	0	2	0	0	0	0	0	0	4
Bus Blockages (#/hr)	Perm	NA	NA	Perm	NA	Perm	NA	NA	pm-pt	NA	NA	NA
Turn Type	4	8	8	2	2	2	2	2	1	6	6	6
Protected Phases	4	8	8	2	2	2	2	2	1	6	6	6
Permitted Phases	15.2	15.2	15.2	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0
Actuated Green, G (s)	0.20	0.20	0.20	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Effective Green, g (s)	4.0	4.0	4.0	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Actuated G/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Clearance Time (s)	281	310	1155	c0.31	c0.31	c0.31	c0.31	c0.31	c0.31	c0.31	c0.31	c0.31
Vehicle Extension (s)	0.05	0.26	0.27	25.2	25.2	25.2	6.5	6.2	6.2	6.2	6.2	6.2
v/s Ratio Prot	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
v/s Ratio Perm	0.7	25.9	25.9	7.9	7.9	7.9	6.4	6.4	6.4	6.4	6.4	6.4
v/c Ratio	C	C	C	A	A	A	A	A	A	A	A	A
Uniform Delay, d1	25.9	25.9	25.9	7.9	7.9	7.9	6.4	6.4	6.4	6.4	6.4	6.4
Progression Factor	25.9	25.9	25.9	7.9	7.9	7.9	6.4	6.4	6.4	6.4	6.4	6.4
Incremental Delay, d2	C	C	C	A	A	A	A	A	A	A	A	A
Delay (s)	C	C	C	A	A	A	A	A	A	A	A	A
Level of Service	C	C	C	A	A	A	A	A	A	A	A	A
Approach Delay (s)	C	C	C	A	A	A	A	A	A	A	A	A
Approach LOS	C	C	C	A	A	A	A	A	A	A	A	A
Intersection Summary	HCM 2000 Control Delay: 10.8 HCM 2000 Level of Service: B HCM 2000 Volume to Capacity ratio: 0.44 Actuated Cycle Length (s): 75.0 Sum of lost time (s): 13.8 Intersection Capacity Utilization: 66.1% ICU Level of Service: C Analysis Period (min): 15 Critical Lane Group:											

10: Dorval Road & Wyecroft Road

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	17.5%	33.3%	17.5%	33.3%	14.2%	35.0%	14.2%	35.0%	14.2%	35.0%	14.2%	35.0%
Traffic Volume (vph)	215	115	20	125	110	1325	150	1015	150	1015	150	1015
Future Volume (vph)	215	115	20	125	110	1325	150	1015	150	1015	150	1015
Turn Type	Prot	NA	pm-pt	NA	pm-pt	NA	Prot	NA	NA	Prot	NA	NA
Protected Phases	7	4	3	8	5	2	1	6	6	6	6	6
Permitted Phases	7	4	3	8	5	2	1	6	6	6	6	6
Detector Phase	7.0	10.0	7.0	10.0	7.0	20.0	7.0	20.0	7.0	20.0	7.0	20.0
Switch Phase	12.0	25.0	12.0	25.0	12.0	41.0	12.0	41.0	12.0	41.0	12.0	41.0
Minimum Initial (s)	21.0	40.0	21.0	40.0	17.0	42.0	17.0	42.0	17.0	42.0	17.0	42.0
Minimum Split (s)	17.5%	33.3%	17.5%	33.3%	14.2%	35.0%	14.2%	35.0%	14.2%	35.0%	14.2%	35.0%
Total Split (s)	16.0	33.0	16.0	33.0	12.0	35.0	12.0	35.0	12.0	35.0	12.0	35.0
Maximum Green (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
Yellow Time (s)	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0
All-Red Time (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
Lost Time Adjust (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Total Lost Time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Lead/Lag	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead-Lag Optimize?	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (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
Time Before Reduce (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
Time To Reduce (s)	None	None	None	None	None	None	None	None	None	None	None	None
Recall Mode	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Walk Time (s)	11.0	11.0	11.0	11.0	11.0	27.0	11.0	27.0	11.0	27.0	11.0	27.0
Flash Dont Walk (s)	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Calls (#/hr)	None	None	None	None	None	None	None	None	None	None	None	None
Intersection Summary	Cycle Length: 120 Actuated Cycle Length: 120 Offset: 118 (98%), Referenced to phase 2:NETL and 6:SBT, Start of Green Natural Cycle: 90 Control Type: Actuated-Coordinated											
Splits and Phases:	10: Dorval Road & Wyecroft Road Ø1 (17 s) Ø2 (R) (21 s) Ø3 (20 s) Ø4 (17 s) Ø5 (17 s) Ø6 (R) (21 s) Ø7 (21 s) Ø8 (20 s)											

Queues
10: Dorval Road & Wynecroft Road

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	234	239	22	381	120	1505	163	1581
v/c Ratio	0.60	0.30	0.09	0.66	0.54	0.66	0.44	0.72
Control Delay	56.6	20.8	26.6	24.4	27.9	15.9	53.6	27.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.6	20.8	26.6	24.4	27.9	15.9	53.6	27.8
Queue Length 50th (m)	27.0	11.5	3.7	17.1	8.2	92.9	18.8	101.1
Queue Length 95th (m)	40.0	24.1	9.1	31.3	m13.1	m128.5	28.7	140.3
Internal Link Dist (m)	155.6		199.3		494.4		672.1	
Turn Bay Length (m)	115.0	145.0		65.0		125.0		
Base Capacity (vph)	416	931	358	1032	239	2274	382	2211
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.26	0.06	0.37	0.50	0.66	0.43	0.72
Intersection Summary								
m Volume for 95th percentile queue is metered by upstream signal.								

HCM Signalized Intersection Capacity Analysis
10: Dorval Road & Wynecroft Road

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	TT	TT	TT	F	TT	TT	TT	TT	TT	TT	TT	TT
Traffic Volume (vph)	215	115	105	20	125	225	110	1325	60	150	1015	440
Future Volume (vph)	215	115	105	20	125	225	110	1325	60	150	1015	440
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Lane Util. Factor	0.97	0.95	1.00	0.95	1.00	0.95	1.00	0.91	1.00	0.97	0.91	0.91
Fpb. ped/bikes	1.00	0.99	1.00	0.99	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00
Frt	1.00	0.93	1.00	0.90	1.00	0.90	1.00	0.99	1.00	1.00	0.95	1.00
Flt Protected	3127	3066	1637	3132	1641	5034	3433	4670				
Satd. Flow (prot)	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Flt Permitted	0.95	1.00	0.60	1.00	0.08	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3127	3066	1039	3132	138	5034	3433	4670				
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)	234	125	114	22	136	245	120	1440	65	163	1103	478
RTOR Reduction (vph)	0	87	0	0	202	0	0	3	0	0	52	0
Lane Group Flow (vph)	234	152	0	22	179	0	120	1502	0	163	1529	0
Confl. Peds. (#/hr)	2	3	3	3	2	2	1					
Heavy Vehicles (%)	12%	7%	9%	10%	5%	2%	10%	2%	1%	2%	5%	7%
Bus Blockages (#/hr)	0	2	0	0	0	0	0	3	0	0	0	0
Turn Type	Prot	NA	NA	pm-pt	NA	pm-pt	NA	NA	Prot	NA	NA	NA
Protected Phases	7	4		3	8	5	2		1		6	
Permitted Phases				8		2						
Actuated Green, G (s)	14.9	28.1	21.0	17.1	62.6	51.1	12.9	52.5				
Effective Green, g (s)	14.9	28.1	21.0	17.1	62.6	51.1	12.9	52.5				
Actuated g/C Ratio	0.12	0.23	0.18	0.14	0.52	0.43	0.11	0.44				
Clearance Time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0				
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Lane Grp Cap (vph)	388	717	201	446	216	2143	369	2043				
v/s Ratio Prot	c0.07	0.05	0.00	c0.06	c0.05	0.30	0.05	c0.33				
v/s Ratio Perm				0.02		0.24						
v/c Ratio	0.60	0.21	0.11	0.40	0.56	0.70	0.44	0.75				
Uniform Delay, d1	49.8	37.0	41.4	46.8	19.2	28.2	50.2	28.2				
Progression Factor	1.00	1.00	1.00	1.00	1.27	0.56	1.00	1.00				
Incremental Delay, d2	3.9	0.3	0.5	1.2	2.6	1.0	1.8	2.6				
Delay (s)	53.6	37.3	41.9	48.0	27.0	16.6	51.9	30.8				
Level of Service	D	D	D	D	C	B	D	C				
Approach Delay (s)		45.4		47.7		17.4		32.8				
Approach LOS		D		D		B		C				
Intersection Summary												
HCM 2000 Control Delay	29.7											C
HCM 2000 Volume to Capacity ratio	0.64											
Actuated Cycle Length (s)	120.0											24.0
Intersection Capacity Utilization	72.8%											C
Analysis Period (min)	15											
c Critical Lane Group												

11: Speers Road & Interim Connection

Future Total AM (Phase 1)
Upper Kerr Village (8/724-01)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	20	870	745	20	45	55
Future Volume (Veh/h)	20	870	745	20	45	55
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	946	810	22	49	60
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLT	TL	TWLT	TL		
Median storage (veh)	2	2				
Upstream signal (m)	66	169				
pX platoon unblocked	0.87		0.90	0.87		
VC, conflicting volume	832		1338	416		
VC1, stage 1 conf vol				821		
VC2, stage 2 conf vol				517		
VCU, unblocked vol	513		899	35		
IC, single (s)	4.1		6.8	6.9		
IC, 2 stage (s)	2.2		3.5	3.3		
p0 queue free %	98		89	93		
CM capacity (veh/h)	927		437	903		
Direction_Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1 SB 2
Volume Total	22	473	473	540	292	49 60
Volume Left	22	0	0	0	0	49 0
Volume Right	0	0	0	0	22	0 60
cSH	927	1700	1700	1700	437	903
Volume to Capacity	0.02	0.28	0.28	0.32	0.17	0.11 0.07
Queue Length 95th (m)	0.6	0.0	0.0	0.0	2.9	1.6
Control Delay (s)	9.0	0.0	0.0	0.0	14.3	9.3
Lane LOS	A	A	A	B	B	A
Approach Delay (s)	0.2		0.0	0.0	11.5	
Approach LOS					B	
Intersection Summary						
Average Delay	0.8					
Intersection Capacity Utilization	34.0%					
ICU Level of Service	A					
Analysis Period (min)	15					

14: Kerr Street & Rail Track

Future Total AM (Phase 1)
Upper Kerr Village (8/724-01)

Lane Group	NBT	SBT	Ø4
Lane Configurations	↔	↔	↔
Traffic Volume (vph)	495	500	
Future Volume (vph)	495	500	
Turn Type	NA	NA	
Protected Phases	2	6	4
Permitted Phases	2	6	
Detector Phase			
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	22.0	22.0	22.0
Total Split (s)	140.0	140.0	40.0
Total Split (%)	77.8%	77.8%	22%
Maximum Green (s)	138.0	138.0	38.0
Yellow Time (s)	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	2.0	2.0	
Lead/Lag			
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0
Recall Mode	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0
Intersection Summary			
Cycle Length: 180			
Actuated Cycle Length: 180			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 45			
Control Type: Prelimed			
Splits and Phases: 14: Kerr Street & Rail Track			
Ø2 (R)	↔	↔	↔
Ø4	↔	↔	↔
Ø6 (R)	↔	↔	↔
Ø4	↔	↔	↔
Ø6 (R)	↔	↔	↔
Ø4	↔	↔	↔
Ø6 (R)	↔	↔	↔
Ø4	↔	↔	↔
Ø6 (R)	↔	↔	↔

Queues
14.: Kerr Street & Rail Track

Future Total AM (Phase 1)
Upper Kerr Village (8724-01)

	NBT	SBT	SBT
Lane Group	538	543	
Lane Group Flow (vph)	0.37	0.38	
v/c Ratio	7.7	7.8	
Control Delay	55.0	0.0	
Queue Delay	62.7	7.8	
Total Delay	57.3	58.5	
Queue Length 50th (m)	73.3	75.0	
Queue Length 95th (m)	21.4	418.6	
Internal Link Dist (m)	1442	1414	
Turn Bay Length (m)	968	0	
Starvation Cap Reductn	0	0	
Spillback Cap Reductn	0	0	
Storage Cap Reductn	1.14	0.38	
Reduced v/c Ratio			
Intersection Summary			

HCM Signalized Intersection Capacity Analysis
14.: Kerr Street & Rail Track

Future Total AM (Phase 1)
Upper Kerr Village (8724-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔						↑			↓	↔
Traffic Volume (vph)	0	0	0	0	0	0	0	495	0	0	500	0
Future Volume (vph)	0	0	0	0	0	0	0	495	0	0	500	0
Ideal Flow (vphpb)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)								2.0				2.0
Lane Util. Factor								1.00			1.00	
Flt Protected								1.00			1.00	
Satd. Flow (prot)								1881			1845	
Flt Permitted								1.00			1.00	
Satd. Flow (perm)								1881			1845	
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)	0	0	0	0	0	0	0	538	0	0	543	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	538	0	0	543	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	3%	0%
Turn Type								NA			NA	
Protected Phases		4						2			6	
Permitted Phases												
Actuated Green, G (s)								138.0			138.0	
Effective Green, g (s)								138.0			138.0	
Actuated g/C Ratio								0.77			0.77	
Clearance Time (s)								2.0			2.0	
Lane Grp Cap (vph)								1442			1414	
v/s Ratio Prot								0.29			0.29	
v/c Ratio								0.37			0.38	
Uniform Delay, d1								6.9			6.9	
Progression Factor								1.00			1.00	
Incremental Delay, d2								0.7			0.8	
Delay (s)								7.6			7.7	
Level of Service								A			A	
Approach Delay (s)		0.0		0.0				7.6			7.7	
Approach LOS		A		A				A			A	
Intersection Summary												
HCM 2000 Control Delay								7.7			A	
HCM 2000 Volume to Capacity ratio								0.30				
Actuated Cycle Length (s)								180.0			4.0	
Intersection Capacity Utilization								29.6%			A	
Analysis Period (min)								15				
c. Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
 1: Kerr Street & Wycroft Road

Future Total PM (Phase 1)
 Upper Kerr Village (8/7/24-01)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	25	130	115	610	505	110
Future Volume (Veh/h)	25	130	115	610	505	110
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	27	140	124	656	543	118
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)				None	None	None
Median type						
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	1183	336	666			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	1183	336	666			
IC, single (s)	6.8	7.0	4.2			
IC, 2 stage (s)						
p0 queue free %	3.5	3.3	2.3			
IF (s)	83	79	86			
CM capacity (veh/h)	159	651	889			
Direction_Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	27	140	124	328	328	362 299
Volume Left	27	0	124	0	0	0 0
Volume Right	0	140	0	0	0	0 118
cSH	159	651	889	1700	1700	1700
Volume to Capacity	0.17	0.21	0.14	0.19	0.19	0.21 0.18
Queue Length 95th (m)	4.5	6.2	3.7	0.0	0.0	0.0 0.0
Control Delay (s)	32.3	12.0	9.7	0.0	0.0	0.0 0.0
Lane LOS	D	B	A			
Approach Delay (s)	15.3		1.5			0.0
Approach LOS	C					
Intersection Summary						
Average Delay	2.3					
Intersection Capacity Utilization	37.3%					
ICU Level of Service	A					
Analysis Period (min)	15					

Timings
 2: Kerr Street & Shepherd Road

Future Total PM (Phase 1)
 Upper Kerr Village (8/7/24-01)

Lane Group	WBL	WBT	NBT	NBR	SBL	SBT	Ø4
Lane Configurations	↔	↔	↔	↔	↔	↔	
Traffic Volume (vph)	100	0	530	110	155	445	
Future Volume (vph)	100	0	530	110	155	445	
Turn Type	Perm	NA	NA	Perm	pm+pt	NA	
Protected Phases	8		2		1	6	4
Permitted Phases	8		2	2	6		
Detector Phase	8		2	2	1	6	
Switch Phase							
Minimum Initial (s)	5.0	5.0	18.0	18.0	7.0	18.0	5.0
Minimum Split (s)	22.0	22.0	28.2	28.2	11.0	28.2	22.0
Total Split (s)	33.0	33.0	53.0	53.0	22.0	75.0	33.0
Total Split (%)	30.6%	30.6%	49.1%	49.1%	20.4%	69.4%	31%
Maximum Green (s)	29.0	29.0	47.8	47.8	18.0	69.8	29.0
Yellow Time (s)	3.0	3.0	3.3	3.3	4.0	3.3	3.0
All-Red Time (s)	1.0	1.0	1.9	1.9	0.0	1.9	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	5.2	5.2	4.0	5.2	4.0
Lead/Lag			Lag	Lag	Lead		
Lead-Lag Optimize?			Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.5	3.5	2.5	3.5	3.0
Minimum Gap (s)	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
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	Min	Min	None	Min	None
Walk Time (s)	7.0	7.0	10.0	10.0	10.0	10.0	7.0
Flash Dont Walk (s)	11.0	11.0	13.0	13.0	13.0	13.0	11.0
Pedestrian Calls (#/hr)	0	0	5	5	5	5	0
Intersection Summary							
Cycle Length: 108							
Actuated Cycle Length: 49.1							
Natural Cycle: 65							
Control Type: Semi Act-Uncoordinated							
Splits and Phases: 2: Kerr Street & Shepherd Road							
	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	
	23.6	53.3	53.3	33.3	53.3	23.6	

Queues
2: Kerr Street & Shepherd Road

Future Total PM (Phase 1)
Upper Kerr Village (8/24-01)

	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group	103	149	546	113	160	459
Lane Group Flow (vph)	0.41	0.23	0.40	0.17	0.26	0.21
v/c Ratio	23.4	0.8	12.5	3.7	4.9	4.6
Control Delay	0.0	0.0	0.0	0.0	0.3	0.1
Queue Delay	23.4	0.8	12.5	3.7	5.2	4.6
Queue Length 50th (m)	7.6	0.0	16.6	0.0	4.1	7.1
Queue Length 95th (m)	20.9	0.0	31.9	7.6	11.2	14.8
Internal Link Dist (m)	241.3 143.2					
Turn Bay Length (m)	50.0 50.0					
Base Capacity (vph)	794 1091 3385 1471 856 3574					
Starvation Cap Reductn	0 0 0 0 348 1631					
Spillback Cap Reductn	0 0 0 0 0 0					
Storage Cap Reductn	0 0 0 0 0 0					
Reduced v/c Ratio	0.13	0.14	0.16	0.08	0.31	0.24
Intersection Summary						

HCM Signalized Intersection Capacity Analysis
2: Kerr Street & Shepherd Road

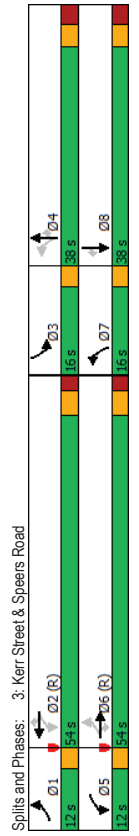
Future Total PM (Phase 1)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Traffic Volume (vph)	0	0	0	100	0	145	0	530	110	155	445	0
Future Volume (vph)	0	0	0	100	0	145	0	530	110	155	445	0
Ideal Flow (vphpb)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0 4.0			5.2 4.0			5.2 4.0			5.2		
Lane Util. Factor	1.00 1.00			1.00 0.97			1.00 0.97			1.00 0.95		
Fpb. ped/bikes	0.98 1.00			1.00 1.00			1.00 1.00			1.00 1.00		
Fpb. ped/bikes	1.00 0.85			1.00 0.85			1.00 0.85			1.00 1.00		
Frt	1.00 0.95			1.00 1.00			1.00 1.00			1.00 0.95		
Flt Protected	1717 1538			3539 1543			1804 3574					
Satd. Flow (prot)	0.76 1.00			1.00 1.00			1.00 0.96			1.00		
Flt Permitted	1368 1538			3539 1543			684 3574					
Peak-Hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	0	0	103	0	149	0	546	113	160	459	0
RTOR Reduction (vph)	0	0	0	0	121	0	0	0	69	0	0	0
Lane Group Flow (vph)	0	0	0	103	28	0	546	44	160	459	0	0
Confl. Peds. (#/hr)	5	15	15	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	0%	0%	0%	3%	0%	1%	0%	2%	0%	1%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	3	0	0	5	0	0	0	0
Turn Type	Perm	Perm	NA	NA	Perm	NA	Perm	NA	Perm	pm-pt	NA	Perm
Protected Phases	4			8			2			1 6		
Permitted Phases	4			8			2			1 6		
Actuated Green, G (s)	9.2			9.2			19.0			19.0 30.6 30.6		
Effective Green, g (s)	9.2			9.2			19.0			19.0 30.6 30.6		
Actuated g/C Ratio	0.19			0.19			0.39			0.39 0.62 0.62		
Clearance Time (s)	4.0			4.0			5.2			4.0 5.2		
Vehicle Extension (s)	3.0			3.0			3.5			3.5 2.5 3.5		
Lane Grp Cap (vph)	256			288			1372			598 600 2231		
v/s Ratio Prot	0.02			0.02			0.04			0.13		
v/s Ratio Perm	0.08			0.08			0.03			0.12		
v/c Ratio	0.40			0.10			0.40			0.07 0.27 0.21		
Uniform Delay, d1	17.5			16.5			10.9			9.5 4.0 4.0		
Progression Factor	1.00			1.00			1.00			1.00 1.00 1.00		
Incremental Delay, d2	1.0			0.1			0.2			0.1 0.2 0.1		
Delay (s)	18.5			16.6			11.1			9.5 4.2 4.0		
Level of Service	B			B			B			A A A		
Approach Delay (s)	0.0			17.4			10.8			4.1 A		
Approach LOS	A			B			B			A		
Intersection Summary												
HCM 2000 Control Delay	9.2			HCM 2000 Level of Service			A					
HCM 2000 Volume to Capacity ratio	0.37											
Actuated Cycle Length (s)	49.0			Sum of lost time (s)			13.2					
Intersection Capacity Utilization	54.6%			ICU Level of Service			A					
Analysis Period (min)	15											
c Critical Lane Group												

Timings
3: Kerr Street & Speers Road

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	85	595	135	300	935	445	150	155	235	260	240	80
Traffic Volume (vph)	85	595	135	300	935	445	150	155	235	260	240	80
Future Volume (vph)	pm-pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm
Turn Type	1	6	6	2	2	2	4	4	4	4	3	8
Protected Phases	6	6	6	2	2	2	4	4	4	4	3	8
Permitted Phases	1	6	6	5	2	2	7	7	7	4	3	8
Detector Phase	1	6	6	5	2	2	7	7	7	4	3	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	16.0	38.0	38.0	16.0	38.0	38.0
Total Split (%)	10.0%	45.0%	45.0%	10.0%	45.0%	45.0%	13.3%	31.7%	31.7%	13.3%	31.7%	31.7%
Maximum Green (s)	9.0	48.1	48.1	9.0	48.1	48.1	13.0	31.7	31.7	13.0	31.7	31.7
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	Lead	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
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
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	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	14.0	14.0
Pedestrian Calls (#/hr)	15	15	15	15	15	15	35	35	35	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
3: Kerr Street & Speers Road

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	89	626	142	316	984	468	158	163	247	274	253	84
v/c Ratio	0.28	0.39	0.18	0.63	0.56	0.48	0.52	0.49	0.54	0.77	0.73	0.24
Control Delay	10.8	22.7	9.9	19.3	23.6	3.7	34.2	48.2	10.0	66.9	57.9	9.6
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	10.8	22.7	9.9	19.3	23.6	3.7	34.2	48.2	10.0	66.9	57.9	9.6
Queue Length 50th (m)	10.9	55.5	9.4	33.2	81.9	0.0	26.8	34.9	1.6	32.6	56.8	0.0
Queue Length 95th (m)	22.0	81.6	21.0	57.7	119.8	19.3	39.3	51.8	22.2	47.8	78.7	12.4
Internal Link Dist (m)	138.4			474.4			103.4					143.2
Turn Bay Length (m)	105.0		75.0	75.0		100.0	50.0		45.0	80.0		75.0
Base Capacity (vph)	340	1591	784	501	1771	976	323	495	568	375	501	458
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	0.26	0.39	0.18	0.63	0.56	0.48	0.49	0.33	0.43	0.73	0.50	0.18

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

3: Kerr Street & Speers Road HCM Signalized Intersection Capacity Analysis

Future Total PM (Phase 1)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	85	595	135	300	935	445	150	155	235	260	240	80
Future Volume (vph)	85	595	135	300	935	445	150	155	235	260	240	80
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	0.97	1.00	1.00	0.93
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Ft	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	0.95	1.00	1.00	0.95
Satd. Flow (prot)	1802	3511	1560	1750	3539	1485	1768	1877	1486	3467	1900	1501
Flt Permitted	0.22	1.00	1.00	0.33	1.00	1.00	0.35	1.00	0.85	1.00	1.00	0.85
Satd. Flow (perm)	423	3511	1560	607	3539	1485	649	1877	1486	3467	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)	80	626	142	316	984	468	158	163	247	274	253	84
RTOR Reduction (vph)	0	0	78	0	0	234	0	0	196	0	0	69
Lane Group Flow (vph)	89	626	64	316	984	234	158	163	51	274	253	15
Confl. Peds. (#/hr)	30	5	5	5	5	30	35	35	35	35	35	35
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	0%	0%	0%
Bus Blockages (#/hr)	0	4	0	0	0	0	0	3	0	0	0	0
Turn Types	pm-pt	NA	Perm	pm-pt	NA	Perm	pm-pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	6	5	2	2	7	4			3	8	
Permitted Phases	6	6	2	2	2	4	4			4	8	
Actuated Green, G (s)	62.4	54.4	54.4	71.0	60.0	60.0	33.1	21.4	21.4	12.4	22.1	22.1
Effective Green, g (s)	62.4	54.4	54.4	71.0	60.0	60.0	33.1	21.4	21.4	12.4	22.1	22.1
Actuated G/C Ratio	0.52	0.45	0.45	0.59	0.50	0.50	0.28	0.18	0.18	0.10	0.18	0.18
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)	311	1591	707	488	1769	742	288	334	265	358	349	276
v/s Ratio Prot	0.02	0.18	0.04	c0.07	0.28	0.16	0.10	0.05	0.09	0.03	c0.08	c0.13
v/s Ratio Perm	0.13	0.39	0.09	0.65	0.56	0.32	0.55	0.49	0.19	0.77	0.72	0.06
v/s Ratio	15.3	21.8	18.7	13.2	20.8	17.8	34.9	44.4	41.9	52.4	46.1	40.4
Uniform Delay, d1	0.76	0.94	2.51	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	0.4	0.7	0.3	2.6	1.3	1.1	1.7	1.5	0.5	9.0	7.8	0.1
Incremental Delay, d2	12.1	21.3	47.2	15.8	22.0	18.9	36.6	45.9	42.4	61.4	53.9	40.5
Level of Service	B	C	D	B	C	B	D	D	D	E	D	D
Approach Delay (s)	24.7			20.1			41.8			55.4		
Approach LOS	C			C			D			E		
Intersection Summary												
HCM 2000 Control Delay	30.0 HCM 2000 Level of Service C											
HCM 2000 Volume to Capacity ratio	0.70											
Actuated Cycle Length (s)	120.0 Sum of lost time (s) 18.2											
Intersection Capacity Utilization	78.6% ICU Level of Service D											
Analysis Period (min)	15											
Critical Lane Group	c											

4: Dorval Road & Speers Road Future Total PM (Phase 1)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	
Traffic Volume (vph)	415	510	50	170	690	510	65	625	270	695	375	
Future Volume (vph)	415	510	50	170	690	510	65	625	270	695	375	
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm-pt	NA	pm+pt	NA	Perm	
Protected Phases	7	4	3	8	1	5	2	1	6			
Detector Phases	7	4	4	3	8	1	5	2	1	6	6	
Switch Phase	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	7.0	20.0	20.0	
Minimum Initial (s)	11.0	42.0	42.0	11.0	42.0	11.0	11.0	40.0	11.0	40.0	40.0	
Minimum Split (s)	19.0	44.0	44.0	17.0	42.0	19.0	11.0	40.0	19.0	48.0	48.0	
Total Split (%)	15.8%	36.7%	36.7%	14.2%	35.0%	15.8%	9.2%	33.3%	15.8%	40.0%	40.0%	
Maximum Green (s)	15.0	37.0	37.0	13.0	35.0	15.0	7.0	33.0	15.0	41.0	41.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	3.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	1.0	1.0	3.0	1.0	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	
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0	
Minimum Gap (s)	3.0	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	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	0.0	
Recall Mode	None	None	None	None	None	None	None	C-Min	None	C-Min	C-Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	
Pedestrian Calls (#/hr)	5	5	5	5	5	5	5	5	5	5	5	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 17 (14%), Referenced to phase 2,NBTL and 6:SBTL, Start of Green												
Natural Cycle: 115												
Control Type: Actuated-Coordinated												



Queues
4: Dorval Road & Speers Road

Future Total PM (Phase 1)
Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group	451	554	54	185	750	554	71	761	293	755	408
Lane Group Flow (vph)	0.92	0.50	0.09	0.47	0.78	0.77	0.25	0.80	0.89	0.68	0.51
v/c Ratio	77.3	35.6	0.3	31.9	54.8	26.5	21.2	47.2	61.8	16.3	2.6
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	77.3	35.6	0.3	31.9	54.8	26.5	21.2	47.2	61.8	16.3	2.6
Queue Length 50th (m)	-59.7	56.6	0.0	29.2	77.8	42.3	9.1	86.0	30.6	63.5	6.4
Queue Length 95th (m)	#91.8	73.1	0.0	53.4	108.5	87.4	17.7	108.8	#100.9	28.0	3.2
Internal Link Dist (m)	412.3			472.1			621.6			494.4	
Turn Bay Length (m)	60.0		60.0	85.0		55.0	70.0		110.0		
Base Capacity (vph)	488	1121	589	412	1034	720	284	975	328	1297	807
Stavation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.49	0.09	0.45	0.73	0.77	0.25	0.78	0.89	0.68	0.51
Intersection Summary											
~ Volume exceeds capacity, queue is theoretically infinite.											
Queue shown is maximum after two cycles.											
# 95th percentile volume exceeds capacity, queue may be longer.											
Queue shown is maximum after two cycles.											

HCM Signalized Intersection Capacity Analysis
4: Dorval Road & Speers Road

Future Total PM (Phase 1)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	
Lane Configurations	TT	TT	T	TT	TT	T	TT	TT	T	TT	TT	
Traffic Volume (vph)	415	510	50	170	690	510	65	625	75	270	695	
Future Volume (vph)	415	510	50	170	690	510	65	625	75	270	695	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	
Fpb. ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flt Protected	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	1.00	1.00	0.85	
Satd. Flow (prot)	3433	3560	1556	1786	3546	1581	1805	3516	1787	3574	1599	
Flt Permitted	0.95	1.00	1.00	0.40	1.00	1.00	0.31	1.00	0.14	1.00	1.00	
Satd. Flow (perm)	3433	3560	1556	743	3546	1581	597	3516	267	3574	1599	
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	
Adj. Flow (vph)	451	554	54	185	750	554	71	679	82	283	755	
RTOR Reduction (vph)	0	0	37	0	0	43	0	8	0	0	229	
Lane Group Flow (vph)	451	554	17	185	750	511	71	753	0	283	755	
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5	
Heavy Vehicles (%)	2%	1%	2%	1%	1%	1%	0%	1%	1%	1%	1%	
Bus Blockages (#/hr)	0	2	0	0	4	0	0	0	0	0	0	
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm-pt	NA	pm-pt	NA	Perm	
Protected Phases	7	4		3	8	1	5	2	1	6		
Permitted Phases			4	8	8	8	2		6		6	
Actuated Green, G (s)	17.1	37.7	37.7	44.2	32.4	48.6	38.1	32.3	52.5	42.7	42.7	
Effective Green, g (s)	17.1	37.7	37.7	44.2	32.4	48.6	38.1	32.3	52.5	42.7	42.7	
Actuated g/C Ratio	0.14	0.31	0.31	0.37	0.27	0.41	0.32	0.27	0.44	0.36	0.36	
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0	
Lane Grp Cap (vph)	489	1118	488	376	957	640	247	946	322	1271	568	
v/s Ratio Prot	c0.13	0.16		0.05	0.21	c0.11	0.01	0.21	c0.12	0.21		
v/s Ratio Perm			0.01	0.13	0.22	0.08		0.08	c0.28		0.11	
v/c Ratio	0.92	0.50	0.03	0.49	0.78	0.80	0.29	0.80	0.91	0.59	0.31	
Uniform Delay, d1	50.8	33.4	28.5	26.8	40.6	31.4	29.2	40.8	28.4	31.6	28.0	
Progression Factor	1.00	1.00	1.00	1.44	1.20	0.83	1.00	1.00	1.49	0.46	0.15	
Incremental Delay, d2	23.0	0.7	0.1	1.0	4.8	6.7	0.6	6.9	24.0	1.7	1.2	
Delay (s)	73.8	34.2	28.6	39.6	53.6	32.8	29.8	47.7	66.5	16.2	5.4	
Level of Service	E	C	C	D	D	C	C	D	E	B	A	
Approach Delay (s)	50.7			44.1			46.2			23.3		
Approach LOS	D			D			D			C		
Intersection Summary												
HCM 2000 Control Delay	39.6			HCM 2000 Level of Service			D					
HCM 2000 Volume to Capacity ratio	0.90											
Actuated Cycle Length (s)	120.0											
Sum of lost time (s)	22.0											
Intersection Capacity Utilization	85.4%			ICU Level of Service			E					
Analysis Period (min)	15											
Critical Lane Group	c											

Timings
5. St. Augustine Drive & Speers Road

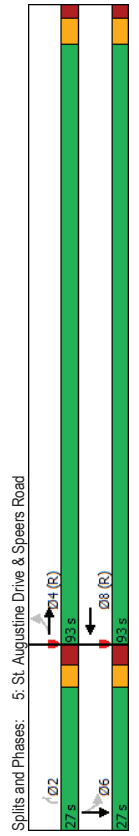
Queues
5. St. Augustine Drive & Speers Road

Future Total PM (Phase 1)
Upper Kerr Village (8724-01)

Future Total PM (Phase 1)
Upper Kerr Village (8724-01)

Lane Group	EBL	EBT	WBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	10	820	1130	25	5	0
Future Volume (vph)	10	820	1130	25	5	0
Turn Type	Perm	NA	NA	Perm	NA	NA
Protected Phases	4	8	8	6	6	6
Permitted Phases	4	4	8	2	6	6
Detector Phase	4	4	8	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.9	23.9	23.9	24.3	24.3	24.3
Total Split (s)	93.0	93.0	93.0	27.0	27.0	27.0
Total Split (%)	77.5%	77.5%	77.5%	22.5%	22.5%	22.5%
Maximum Green (s)	87.1	87.1	87.1	20.7	20.7	20.7
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	2.2	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.9	5.9	6.3	6.3	6.3
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	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
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Min	C-Min	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 27 (23%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated



Lane Group	EBL	EBT	WBT	NBR	SBL	SBT
Lane Group Flow (vph)	10	880	1187	26	5	10
v/c Ratio	0.03	0.27	0.37	0.09	0.06	0.05
Control Delay	1.0	0.9	2.9	0.6	55.4	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.0	0.9	2.9	0.6	55.4	0.5
Queue Length 50th (m)	0.2	9.6	90.6	0.0	1.2	0.0
Queue Length 95th (m)	m0.3	m8.8	2.0	0.0	5.3	0.0
Internal Link Dist (m)		472.1	49.4			93.6
Turn Bay Length (m)		50.0				
Base Capacity (vph)	399	3225	3240	474	311	382
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 v/c Ratio	0.03	0.27	0.37	0.05	0.02	0.03

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

5. St. Augustine Drive & Speers Road

6. Speers Road/Cornwall Road & Cross Avenue

Future Total PM (Phase 1)

Future Total PM (Phase 1)

Upper Kerr Village (8/24-01)

Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	10	820	25	0	1130	10	0	0	25	5	0	10
Future Volume (vph)	10	820	25	0	1130	10	0	0	25	5	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9	5.9	5.9	5.9	5.9	6.3	6.3	6.3	6.3	6.3	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	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	1.00	1.00	1.00	0.86	1.00	0.85	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1800	3551	1800	3569	1800	3569	1644	1805	1615	1805	1615	1805
Flt Permitted	0.23	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	439	3551	439	3569	439	3569	1644	1805	1615	1805	1615	1805
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	10	854	26	0	1177	10	0	0	26	5	0	10
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	25	0	0	10
Lane Group Flow (vph)	5	879	0	0	1187	0	0	0	1	5	0	0
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	NA	NA	NA	NA	Perm	Perm	Perm	NA	NA	NA
Protected Phases	4						8					6
Permitted Phases	4						2					6
Actuated Green, G (s)	104.0	104.0			104.0		3.8		3.8			3.8
Effective Green, g (s)	104.0	104.0			104.0		3.8		3.8			3.8
Actuated G/C Ratio	0.87	0.87			0.87		0.03		0.03			0.03
Clearance Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	6.3		6.3			6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0
Lane Grp Cap (vph)	380	3077			3093		52		57			51
v/s Ratio Prot	0.25				c0.33							0.00
v/s Ratio Perm	0.02				0.00		0.00		c0.00			0.00
v/c Ratio	0.03	0.29			0.38		0.02		0.09			0.01
Uniform Delay, d1	1.1	1.4			1.6		56.3		56.4			56.3
Progression Factor	0.61	0.57			1.78		1.00		1.00			1.00
Incremental Delay, d2	0.1	0.2			0.3		0.1		0.7			0.0
Delay (s)	0.8	1.0			3.2		56.4		57.1			56.3
Level of Service	A	A			A		E		E			E
Approach Delay (s)	1.0				3.2		56.4		56.6			56.6
Approach LOS	A				A		E		E			E
Intersection Summary												
HCM 2000 Control Delay	3.3 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.37											
Actuated Cycle Length (s)	120.0											
Sum of lost time (s)	12.2											
Intersection Capacity Utilization	47.2%											
ICU Level of Service	A											
Analysis Period (min)	15											
Critical Lane Group	c											

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	265	730	1295	10	420	10	420	10	420	10	420	10
Future Volume (vph)	265	730	1295	10	420	10	420	10	420	10	420	10
Turn Type	pm-pt	NA	NA	NA	Prot	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	5	2	2	6	4	4	4	4	4	4	4	4
Permitted Phases	5	2	2	6	4	4	4	4	4	4	4	4
Detector Phase	5	2	2	6	4	4	4	4	4	4	4	4
Switch Phase	6.0	38.0	38.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Initial (s)	12.0	47.6	47.6	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8
Minimum Split (s)	17.0	102.0	85.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0
Total Split (%)	12.1%	72.9%	60.7%	27.1%	27.1%	27.1%	27.1%	27.1%	27.1%	27.1%	27.1%	27.1%
Maximum Green (s)	11.0	95.4	78.4	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
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)	6.0	6.6	6.6	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Lead/Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.5	5.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
Recall Mode	None	C-Min	C-Min	None	None	None	None	None	None	None	None	None
Walk Time (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Flash Dont Walk (s)	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0
Pedestrian Calls (#/hr)	5	5	5	5	5	5	5	5	5	5	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											



	EBL	EBT	WBT	SBL	SBR
Lane Group	276	760	1365	10	438
Lane Group Flow (vph)	0.64	0.26	0.65	0.05	0.80
v/c Ratio	25.3	3.7	21.1	54.3	30.4
Control Delay	0.0	0.0	0.0	0.0	0.0
Queue Delay	25.3	3.7	21.1	54.3	30.4
Total Delay	29.5	21.0	120.8	2.6	21.2
Queue Length 50th (m)	65.9	36.2	161.1	7.8	40.0
Queue Length 95th (m)	474.4	77.5	60.0		
Internal Link Dist (m)	80.0		45.0		
Turn Bay Length (m)	430	2924	2109	415	859
Base Capacity (vph)	0	0	0	0	0
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	0.64	0.26	0.65	0.02	0.51
Intersection Summary					

	EBL	EBT	WBT	SBL	SBR
Movement	EBL	EBT	WBT	SBL	SBR
Lane Configurations	TT	TT	TT	TT	TT
Traffic Volume (vph)	265	730	1295	15	420
Future Volume (vph)	265	730	1295	15	420
Ideal Flow (vphpb)	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
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00
Fpb. 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)	206	3610	3567	1805	2733
Peak-Hour factor, PHF	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	276	760	1349	16	438
RTOR Reduction (vph)	0	0	0	0	270
Lane Group Flow (vph)	276	760	1365	0	168
Confl. Peds. (#/hr)	5		5		
Heavy Vehicles (%)	6%	0%	1%	0%	4%
Turn Type	pm>pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2			4	
Actuated Green, G (s)	113.4	113.4	82.8	14.2	14.2
Effective Green, g (s)	113.4	113.4	82.8	14.2	14.2
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)	429	2924	2109	183	277
v/s Ratio Prot	c0.11	0.21	0.38	0.01	
v/c Ratio Perm	c0.41				c0.06
v/c Ratio	0.64	0.26	0.65	0.05	0.61
Uniform Delay, d1	24.4	3.2	18.9	56.8	60.2
Progression Factor	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.4	0.2	1.5	0.1	3.8
Delay (s)	27.9	3.4	20.5	57.0	64.0
Level of Service	C	A	C	E	E
Approach Delay (s)	9.9	20.5	63.8		
Approach LOS	A	C	E		
Intersection Summary					
HCM 2000 Control Delay		23.5		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		74.6%		ICU Level of Service	D
Analysis Period (min)		15			
c Critical Lane Group					

7: Kerr Street & Prince Charles Drive

8: Kerr Street & Elmwood Road

Future Total PM (Phase 1)
Upper Kerr Village (8/724-01)

Future Total PM (Phase 1)
Upper Kerr Village (8/724-01)

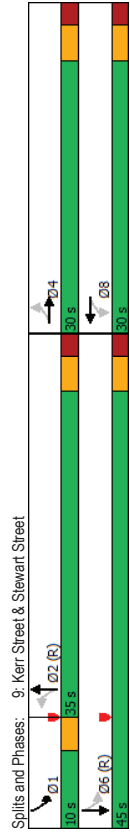
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	10	10	0	30	5	515	10	20	640	25
Future Volume (Veh/h)	10	0	10	10	0	30	5	515	10	20	640	25
Sign Control	Stop	0%	Stop	0%	0%	Free	0%	Free	0%	Free	0%	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	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	542	11	21	674	26
Pedestrians	20			30								5
Lane Width (m)	3.6			3.6								3.6
Walking Speed (m/s)	1.1			1.1								1.1
Percent Blockage	2			3								0
Right turn flare (veh)												
Median type							None					None
Median storage (veh)												
Upstream signal (m)								238				127
pX platoon unblocked	0.80	0.80	0.77	0.80	0.80	0.94	0.77			0.94		
VC, conflicting volume	1344	1342	707	1328	1350	582	720			583		
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	1130	1129	466	1110	1138	522	483			523		
IC, single (s)	7.1	7.0	6.2	7.1	6.5	6.2	4.3			4.1		
IC, 2 stage (s)												
p0 queue free %	3.5	4.5	3.3	3.5	4.0	3.3	2.4			2.2		
IF (s)	91	100	98	92	100	94	99			98		
CM capacity (veh/h)	126	124	452	135	150	507	747			939		
Direction_Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	22	43	588	721								
Volume Left	11	11	5	21								
Volume Right	11	32	11	26								
cSH	197	297	747	939								
Volume to Capacity	0.11	0.14	0.01	0.02								
Queue Length 95th (m)	2.8	3.8	0.2	0.5								
Control Delay (s)	25.6	19.2	0.2	0.6								
Lane LOS	D	C	A	A								
Approach Delay (s)	25.6	19.2	0.2	0.6								
Approach LOS	D	C	A	A								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			59.5%								B	
Analysis Period (min)			15									

Movement	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								
Traffic Volume (veh/h)	15	10	5	510	600	40	40	
Future Volume (Veh/h)	15	10	5	510	600	40	40	
Sign Control	Stop	Free	Free	0%	0%	Free	0%	
Grade	0%	0%	0%	0%	0%	0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	16	11	5	537	632	42	42	
Pedestrians	36							
Lane Width (m)	3.6							
Walking Speed (m/s)	1.1							
Percent Blockage	3							
Right turn flare (veh)								
Median type				None	None			
Median storage (veh)								
Upstream signal (m)					103	262		
pX platoon unblocked	0.86	0.81	0.81					
VC, conflicting volume	1235	688	709					
VC1, stage 1 conf vol								
VC2, stage 2 conf vol								
VCU, unblocked vol	939	496	522					
IC, single (s)	6.4	6.3	4.3					
IC, 2 stage (s)								
p0 queue free %	93	97	99					
IF (s)	243	437	751					
CM capacity (veh/h)								
Direction_Lane #	EB 1	NB 1	SB 1					
Volume Total	27	542	674					
Volume Left	16	5	0					
Volume Right	11	0	42					
cSH	297	751	1700					
Volume to Capacity	0.09	0.01	0.40					
Queue Length 95th (m)	2.3	0.2	0.0					
Control Delay (s)	18.3	0.2	0.0					
Lane LOS	C	A	A					
Approach Delay (s)	18.3	0.2	0.0					
Approach LOS	C	A	A					
Intersection Summary								
Average Delay			0.5					
Intersection Capacity Utilization			44.2%					A
Analysis Period (min)			15					

Timings
9: Kerr Street & Stewart Street

Future Total PM (Phase 1)
Upper Kerr Village (8724-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	50	10	10	15	10	390	55	490
Traffic Volume (vph)	50	10	10	15	10	390	55	490
Future Volume (vph)	Perm	NA	Perm	NA	Perm	NA	prn+pt	NA
Turn Type	4	8	8	2	2	1	6	6
Permitted Phases	4	8	8	2	2	1	6	6
Detector Phase	4	8	8	2	2	1	6	6
Switch Phase	10.0	10.0	10.0	10.0	24.0	24.0	6.0	24.0
Minimum Initial (s)	30.0	30.0	30.0	30.0	32.0	32.0	10.0	32.0
Minimum Split (s)	30.0	30.0	30.0	30.0	35.0	35.0	10.0	45.0
Total Split (s)	40.0%	40.0%	40.0%	40.0%	46.7%	46.7%	13.3%	60.0%
Total Split (%)	24.6	24.6	24.6	24.6	29.6	29.6	7.0	39.6
Maximum Green (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.0	3.3
Yellow Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	2.1
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Total Lost Time (s)	Lead/Lag	Lag	Lag	Lead	Lead	Lead	Yes	Yes
Lead-Lag Optimize?	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Recall Mode	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Walk Time (s)	13.0	13.0	13.0	13.0	14.0	14.0	14.0	14.0
Flash Dont Walk (s)	20	20	20	20	35	35	35	35
Pedestrian Calls (#/hr)	Intersection Summary							
Cycle Length: 75	Cycle Length: 75							
Actuated Cycle Length: 75	Actuated Cycle Length: 75							
Offset: 13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	Offset: 13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green							
Natural Cycle: 75	Natural Cycle: 75							
Control Type: Actuated-Coordinated	Control Type: Actuated-Coordinated							



Queues
9: Kerr Street & Stewart Street

Future Total PM (Phase 1)
Upper Kerr Village (8724-01)

	EBT	WBT	NBT	SBT
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	81	109	451	647
v/c Ratio	0.29	0.29	0.35	0.54
Control Delay	21.6	10.0	7.9	10.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.6	10.0	7.9	10.7
Queue Length 50th (m)	8.5	3.4	18.6	32.3
Queue Length 95th (m)	16.5	13.0	55.3	98.2
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)	444	552	1297	1192
Base Capacity (vph)	0	0	0	0
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	0.18	0.20	0.35	0.54
Intersection Summary				

9: Kerr Street & Stewart Street

HCM Signalized Intersection Capacity Analysis

Future Total PM (Phase 1)

Upper Kerr Village (8/24-01)

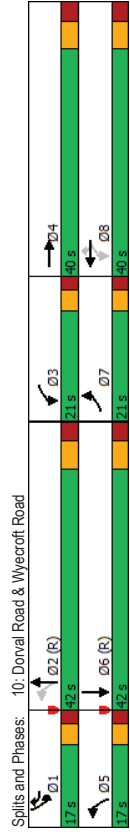
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	50	10	15	10	15	75	10	390	15	55	490	50
Traffic Volume (vph)	50	10	15	10	15	75	10	390	15	55	490	50
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	5.4			5.4			5.4			5.4		
Total Lost time (s)												
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
Fpb. ped/bikes	0.99			0.96			1.00			1.00		0.99
Fpb. ped/bikes	0.98			1.00			1.00			1.00		1.00
Ft	0.97			0.90			1.00			1.00		0.99
Flt Protected	0.97			0.99			1.00			1.00		1.00
Satd. Flow (prot)	1661			1562			1855			1801		1801
Flt Permitted	0.77			0.97			0.98			0.93		0.93
Satd. Flow (perm)	1323			1518			1829			1678		1678
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	424	16	60	533	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	450	0	0	644	0
Confl. Peds. (#/hr)	20	15	15	20	35	20	35	25	25	25	35	35
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Bus Blockages (#/hr)	0	2	0	0	2	0	0	0	0	0	3	0
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA	NA	pm-pt	NA	NA	NA
Protected Phases	4			8			2		1		6	
Permitted Phases	4			8			2		6		6	
Actuated Green, G (s)	13.2			13.2			51.0		51.0		51.0	
Effective Green, g (s)	13.2			13.2			51.0		51.0		51.0	
Actuated G/C Ratio	0.18			0.18			0.68		0.68		0.68	
Clearance Time (s)	5.4			5.4			5.4		5.4		5.4	
Vehicle Extension (s)	4.0			4.0			4.0		4.0		4.0	
Lane Grp Cap. (vph)	232			267			1243		1141		1141	
v/s Ratio Prot												
v/s Ratio Perm	c0.05			0.03			0.25		c0.38		c0.38	
v/c Ratio	0.29			0.16			0.36		0.56		0.56	
Uniform Delay, d1	26.8			26.2			5.1		6.2		6.2	
Progression Factor	1.00			1.00			1.00		1.00		1.00	
Incremental Delay, d2	1.0			0.4			0.8		0.6		0.6	
Delay (s)	27.8			26.5			5.9		6.9		6.9	
Level of Service	C			C			A		A		A	
Approach Delay (s)	27.8			26.5			5.9		6.9		6.9	
Approach LOS	C			C			A		A		A	
Intersection Summary												
HCM 2000 Control Delay	9.5			HCM 2000 Level of Service			A		A		A	
HCM 2000 Volume to Capacity ratio	0.53											
Actuated Cycle Length (s)	75.0			Sum of lost time (s)			13.8		13.8		13.8	
Intersection Capacity Utilization	80.3%			ICU Level of Service			D		D		D	
Analysis Period (min)	15											
c Critical Lane Group												

10: Donval Road & Wyecroft Road

Future Total PM (Phase 1)

Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	385	220	60	90	485	95	1310	120	1135			
Traffic Volume (vph)	385	220	60	90	485	95	1310	120	1135			
Future Volume (vph)	385	220	60	90	485	95	1310	120	1135			
Turn Type	Prot	NA	pm-pt	NA	pm+ov	pm-pt	NA	Prot	NA	Prot	NA	NA
Protected Phases	7	4		3	8		1	5	2	1	6	
Permitted Phases	7	4		3	8		1	5	2	1	6	
Detector Phase												
Switch Phase												
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	10.0	7.0	20.0	7.0	20.0	7.0	20.0
Minimum Split (s)	12.0	25.0	12.0	25.0	12.0	25.0	12.0	41.0	12.0	41.0	12.0	41.0
Total Split (s)	21.0	40.0	21.0	40.0	17.0	17.0	42.0	17.0	42.0	17.0	42.0	17.0
Total Split (%)	17.5%	33.3%	17.5%	33.3%	14.2%	14.2%	35.0%	14.2%	35.0%	14.2%	35.0%	14.2%
Maximum Green (s)	16.0	33.0	16.0	33.0	12.0	12.0	35.0	12.0	35.0	12.0	35.0	12.0
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	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)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Walk Time (s)	7.0			7.0			7.0		7.0		7.0	
Flash Dont Walk (s)	11.0			11.0			27.0		27.0		27.0	
Pedestrian Calls (#/hr)	0			0			0		0		0	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 103 (86%), Referenced to phase 2:NETL and 6:SBT, Start of Green												
Natural Cycle: 90												
Control Type: Actuated-Coordinated												



Queues
10: Dorval Road & Wyecroft Road

Future Total PM (Phase 1)
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group	418	418	65	98	527	103	1467	130	1462
Lane Group Flow (vph)	0.98	0.57	0.22	0.47	0.89	0.42	0.85	0.18	0.64
v/c Ratio	90.1	30.8	30.4	55.4	46.8	13.8	37.5	39.5	27.3
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	90.1	30.8	30.4	55.4	46.8	13.8	37.5	39.5	27.3
Total Delay	51.2	30.1	11.0	21.9	89.9	8.2	135.2	12.6	91.3
Queue Length 50th (m)	#82.7	45.1	19.8	36.6	127.6	m11.4	#60.4	21.8	126.8
Queue Length 95th (m)	155.6			199.3			494.4		672.1
Internal Link Dist (m)	115.0		145.0			65.0		125.0	
Turn Bay Length (m)	428	1004	369	474	593	270	1735	705	2274
Base Capacity (vph)	0	0	0	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.42	0.18	0.21	0.89	0.38	0.85	0.18	0.64

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
10: Dorval Road & Wyecroft Road

Future Total PM (Phase 1)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	TT	TT	TT	T	T	T	TT	TT	TT	TT	TT	TT
Traffic Volume (vph)	385	220	165	60	90	485	95	1310	40	120	1135	210
Future Volume (vph)	385	220	165	60	90	485	95	1310	40	120	1135	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	5.0	5.0	7.0	5.0	5.0	7.0	5.0	7.0	5.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.97	0.91	0.97	0.91
Fpb. ped/bikes	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	3213	3234	1783	1727	1590	1736	5041	3502	4968	3502	4968	3502
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (perm)	3213	3234	953	1727	1590	248	5041	3502	4968	3502	4968	3502
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)	418	239	179	65	98	527	103	1424	43	130	1234	228
RTOR Reduction (vph)	0	128	0	0	0	55	0	3	0	0	17	0
Lane Group Flow (vph)	418	290	0	65	98	472	103	1464	0	130	1445	0
Confl. Peds. (#/hr)	1	4	4	4	4	1	1	1	1	1	1	1
Heavy Vehicles (%)	9%	4%	2%	1%	10%	1%	4%	2%	2%	0%	1%	5%
Bus Blockages (#/hr)	0	2	0	0	0	0	0	3	0	0	0	0
Turn Type	Prot	NA	NA	pm-pt	NA	pm-ov	pm-pt	NA	Prot	NA	Prot	NA
Protected Phases	7	4		3	8	1	5	2		1		6
Permitted Phases				8		8		2				
Actuated Green, G (s)	16.0	22.6		24.6	15.6	39.8	51.1	40.2		24.2		53.5
Effective Green, g (s)	16.0	22.6		24.6	15.6	39.8	51.1	40.2		24.2		53.5
Actuated G/C Ratio	0.13	0.19		0.21	0.13	0.33	0.43	0.34		0.20		0.45
Clearance Time (s)	5.0	7.0		5.0	7.0	5.0	5.0	7.0		5.0		7.0
Vehicle Extension (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0		5.0
Lane Grp Cap (vph)	428	609		257	224	527	240	1888		706		2214
v/s Ratio Prot	c0.13	0.09		0.02	0.06	c0.18	0.04	c0.29		0.04		0.29
v/s Ratio Perm				0.03		0.12		0.14				
v/c Ratio	0.98	0.48		0.25	0.44	0.90	0.43	0.87		0.18		0.65
Uniform Delay, d1	51.8	43.4		39.4	48.2	38.1	21.4	37.4		39.7		26.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.77	0.90		1.00		1.00
Incremental Delay, d2	37.4	1.2		1.1	2.8	18.7	1.4	3.6		0.3		1.5
Delay (s)	89.2	44.6		40.4	51.0	56.8	17.9	37.4		40.0		27.5
Level of Service	F	D		D	D	E	B	D		D		C
Approach Delay (s)												
Approach LOS		E			D		D					C

Intersection Summary
HCM 2000 Control Delay 41.7 HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio 0.90
Actuated Cycle Length (s) 120.0 Sum of lost time (s) 24.0
Intersection Capacity Utilization 83.6% ICU Level of Service E
Analysis Period (min) 15
c Critical Lane Group

11: Speers Road & Interim Connection

Future Total PM (Phase 1)
Upper Kerr Village (8/7/24-01)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	45	805	1095	65	30	45
Future Volume (Veh/h)	45	805	1095	65	30	45
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	875	1190	71	33	49
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLT	TL	TWLT	TL		
Median storage (veh)	2	2				
Upstream signal (m)	73	162				
pX platoon unblocked	0.80		0.82	0.80		
vC, conflicting volume	1261		1761	630		
vC1, stage 1 conf vol			1226			
vC2, stage 2 conf vol			536			
vCu, unblocked vol	839		1284	56		
IC, single (s)	4.1		6.8	6.9		
IC, 2 stage (s)	2.2		3.5	3.3		
p0 queue free %	92		89	94		
p0 capacity (veh/h)	647		295	809		
Direction_Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1 SB 2
Volume Total	49	438	438	793	468	33 49
Volume Left	49	0	0	0	0	33 0
Volume Right	0	0	0	0	71	0 49
cSH	647	1700	1700	1700	295	809
Volume to Capacity	0.08	0.26	0.26	0.47	0.28	0.11 0.06
Queue Length 95th (m)	1.9	0.0	0.0	0.0	2.8	1.5
Control Delay (s)	11.0	0.0	0.0	0.0	18.7	9.7
Lane LOS	B				C	A
Approach Delay (s)	0.6			0.0		13.4
Approach LOS						B
Intersection Summary						
Average Delay	0.7					
Intersection Capacity Utilization	47.4%					
Analysis Period (min)	15					
	ICU Level of Service A					

14: Kerr Street & Rail Track

Future Total PM (Phase 1)
Upper Kerr Village (8/7/24-01)

Lane Group	NBT	SBT	Ø4
Lane Configurations	↔	↔	↔
Traffic Volume (vph)	675	600	
Future Volume (vph)	675	600	
Turn Type	NA	NA	
Protected Phases	2	6	4
Permitted Phases	2	6	
Detector Phase			
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	22.0	22.0	22.0
Total Split (s)	140.0	140.0	40.0
Total Split (%)	77.8%	77.8%	22%
Maximum Green (s)	138.0	138.0	38.0
Yellow Time (s)	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	
Total Lost Time (s)	2.0	2.0	
Lead/Lag			
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0
Recall Mode	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0
Intersection Summary			
Cycle Length	180		
Actuated Cycle Length	180		
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 50			
Control Type: Prelimed			
Splits and Phases: 14: Kerr Street & Rail Track			
	Ø2 (R)	Ø4	Ø4
	140.5	40.3	40.3
	Ø6 (R)		
	140.5		

Queues
14.: Kerr Street & Rail Track

Future Total PM (Phase 1)
Upper Kerr Village (8724-01)

	NBT	SBT
Lane Group	703	625
Lane Group Flow (vph)	0.49	0.43
v/c Ratio	9.2	8.4
Control Delay	53.0	0.0
Queue Delay	62.1	8.4
Total Delay	85.4	71.2
Queue Length 50th (m)	107.7	90.5
Queue Length 95th (m)	21.4	418.6
Internal Link Dist (m)	1442	1442
Turn Bay Length (m)	840	0
Base Capacity (vph)	0	0
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	1.17	0.43
Reduced v/c Ratio		
Intersection Summary		

Future Total PM (Phase 1)
Upper Kerr Village (8724-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔						↔			↔	
Traffic Volume (vph)	0	0	0	0	0	0	0	675	0	0	600	0
Future Volume (vph)	0	0	0	0	0	0	0	675	0	0	600	0
Ideal Flow (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)							2.0					2.0
Lane Util. Factor							1.00				1.00	
Ft							1.00				1.00	
Flt Protected							1.00				1.00	
Satd. Flow (prot)							1881				1881	
Flt Permitted							1.00				1.00	
Satd. Flow (perm)							1881				1881	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	0	0	0	703	0	0	0	625	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	703	0	0	0	625	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%
Turn Type							NA				NA	
Protected Phases		4					2				6	
Permitted Phases												
Actuated Green, G (s)							138.0				138.0	
Effective Green, g (s)							138.0				138.0	
Actuated g/C Ratio							0.77				0.77	
Clearance Time (s)							2.0				2.0	
Lane Grp Cap (vph)							1442				1442	
v/s Ratio Prot							d0.37				0.33	
v/c Ratio							0.49				0.43	
Uniform Delay, d1							7.8				7.3	
Progression Factor							1.00				1.00	
Incremental Delay, d2							1.2				1.0	
Delay (s)							9.0				8.3	
Level of Service							A				A	
Approach Delay (s)		0.0		0.0			9.0				8.3	
Approach LOS		A		A			A				A	
Intersection Summary												
HCM 2000 Control Delay			8.7								A	
HCM 2000 Volume to Capacity ratio			0.38								A	
Actuated Cycle Length (s)			180.0								4.0	
Intersection Capacity Utilization			38.9%								A	
Analysis Period (min)			15									
c. Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
 1: Kerr Street & Wycroft Road

Future Total AM (Phase 1)
 Upper Kerr Village (8/24-01)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	5	85	190	315	470	125
Traffic Volume (veh/h)	5	85	190	315	470	125
Future Volume (Veh/h)	5	85	190	315	470	125
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	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	335	500	133
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)				None	None	None
Median type						
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	1138	316	633			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	1138	316	633			
IC, single (s)	6.8	7.0	4.1			
IC, 2 stage (s)	3.5	3.3	2.2			
p0 queue free %	97	87	79			
CM capacity (veh/h)	156	676	946			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	5	90	202	168	333	300
Volume Left	5	0	202	0	0	0
Volume Right	0	90	0	0	0	133
cSH	156	676	946	1700	1700	1700
Volume to Capacity	0.03	0.13	0.21	0.10	0.10	0.20
Queue Length 95th (m)	0.8	3.5	6.1	0.0	0.0	0.0
Control Delay (s)	28.9	11.1	9.8	0.0	0.0	0.0
Lane LOS	D	B	A			
Approach Delay (s)	12.1		3.7			0.0
Approach LOS	B					
Intersection Summary						
Average Delay	2.5					
Intersection Capacity Utilization	40.8%					
ICU Level of Service	A					
Analysis Period (min)	15					

Timings
 2: Kerr Street & Shepherd Road

Future Total AM (Phase 1)
 Upper Kerr Village (8/24-01)

Lane Group	WBL	WBT	NBT	NBR	SBL	SBT	Ø4
Lane Configurations	115	0	280	70	90	410	
Traffic Volume (vph)	115	0	280	70	90	410	
Future Volume (vph)	115	0	280	70	90	410	
Turn Type	pm+pt	NA	NA	Perm	pm+pt	NA	
Protected Phases	3	8	2		1	6	4
Permitted Phases	8		2	2	6		
Detector Phase	3	8	2	2	1	6	
Switch Phase							
Minimum Initial (s)	5.0	5.0	18.0	18.0	7.0	18.0	5.0
Minimum Split (s)	9.0	22.0	28.2	28.2	11.0	22.0	22.0
Total Split (s)	20.0	51.0	42.0	42.0	15.0	57.0	31.0
Total Split (%)	18.5%	47.2%	38.9%	38.9%	13.9%	52.8%	29%
Maximum Green (s)	16.0	47.0	36.8	36.8	11.0	51.8	27.0
Yellow Time (s)	3.0	3.0	3.3	3.3	4.0	3.3	3.0
All-Red Time (s)	1.0	1.0	1.9	1.9	0.0	1.9	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	5.2	5.2	4.0	5.2	4.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.5	3.5	2.5	3.5	3.0
Minimum Gap (s)	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
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	Min	Min	None	Min	None
Walk Time (s)	7.0	10.0	10.0	10.0	10.0	7.0	
Flash Dont Walk (s)	11.0	13.0	13.0	13.0	13.0	11.0	
Pedestrian Calls (#/hr)	0	5	5	5	5	0	
Intersection Summary							
Cycle Length	108						
Actuated Cycle Length	45.6						
Natural Cycle	75						
Control Type	Semi Ad-Uncooord						
Splits and Phases	2: Kerr Street & Shepherd Road						
	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø8
	55 s	42 s	20 s	51 s	57 s		

Queues
2: Kerr Street & Shepherd Road

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group	126	236	308	77	99	451
Lane Group Flow (vph)	0.40	0.34	0.21	0.11	0.14	0.21
v/c Ratio	21.8	1.3	10.0	2.8	3.9	4.4
Control Delay	0.0	0.0	0.0	0.0	0.7	0.1
Queue Delay	21.8	1.3	10.0	2.8	4.7	4.5
Total Delay	9.3	0.0	8.5	0.0	2.4	6.7
Queue Length 50th (m)	23.0	0.0	16.3	4.9	6.8	13.4
Queue Length 95th (m)	241.3	143.2				21.4
Internal Link Dist (m)				50.0	50.0	
Turn Bay Length (m)	603	1513	2818	1218	780	3465
Base Capacity (vph)	0	0	0	0	473	1599
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 v/c Ratio	0.21	0.16	0.11	0.06	0.32	0.24
Intersection Summary						

HCM Signalized Intersection Capacity Analysis
2: Kerr Street & Shepherd Road

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB	
Traffic Volume (vph)	0	0	0	115	0	215	0	280	70	90	410	0	
Future Volume (vph)	0	0	0	115	0	215	0	280	70	90	410	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)				4.0	4.0			5.2	5.2	4.0	5.2		
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95		
Fpb. ped/bikes				1.00	0.97			1.00	0.97	1.00	1.00		
Fpb. ped/bikes				1.00	1.00			1.00	1.00	1.00	1.00		
Frt				1.00	0.85			1.00	0.85	1.00	1.00		
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00		
Satd. Flow (prot)				1664	1559			3497	1499	1785	3505		
Flt Permitted				0.73	1.00			1.00	1.00	0.47	1.00		
Satd. Flow (perm)				1274	1559			3497	1499	879	3505		
Peak-Hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	
Adj. Flow (vph)	0	0	0	126	0	236	0	308	77	99	451	0	
RTOR Reduction (vph)	0	0	0	0	178	0	0	0	47	0	0	0	
Lane Group Flow (vph)	0	0	0	126	58	0	0	308	30	99	451	0	
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5	
Heavy Vehicles (%)	0%	0%	0%	8%	0%	0%	0%	2%	5%	1%	3%	0%	
Bus Blockages (#/hr)	0	0	0	0	2	0	0	6	0	0	0	0	
Turn Type	Perm	Perm	pm-pt	NA	NA	Perm	NA	NA	Perm	pm-pt	NA	Perm	
Protected Phases		3	8					2		1		6	
Permitted Phases	4						2		2	6			
Actuated Green, G (s)	12.4	12.4	12.4	12.4	12.4	12.4	19.4	19.4	19.4	28.7	28.7	28.7	
Effective Green, g (s)	12.4	12.4	12.4	12.4	12.4	12.4	19.4	19.4	19.4	28.7	28.7	28.7	
Actuated G/C Ratio	0.25	0.25	0.25	0.39	0.39	0.39	0.39	0.39	0.39	0.57	0.57	0.57	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.2	5.2	4.0	5.2	5.2	5.2	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.5	3.5	3.5	2.5	3.5	3.5	
Lane Grp Cap (vph)	367	384					1348	578	597	1999			
v/s Ratio Prot	c0.05	0.04					0.09		0.02	c0.13			
v/s Ratio Perm	c0.04						0.02		0.08				
v/c Ratio	0.34	0.15					0.23	0.05	0.17	0.23			
Uniform Delay, d1	15.5	14.8					10.4	9.7	5.1	5.3			
Progression Factor	1.00	1.00					1.00	1.00	1.00	1.00			
Incremental Delay, d2	0.6	0.2					0.1	0.0	0.1	0.1			
Delay (s)	16.0	15.0					10.5	9.7	5.2	5.4			
Level of Service	B	B					B	A	A	A			
Approach Delay (s)			0.0		15.4		10.4		5.2		5.4		
Approach LOS			A		B		B		A		A		
Intersection Summary													
HCM 2000 Control Delay	9.6											HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32												
Actuated Cycle Length (s)	50.3											Sum of lost time (s)	17.2
Intersection Capacity Utilization	56.0%											ICU Level of Service	B
Analysis Period (min)	15												
c Critical Lane Group													

Timings
3: Kerr Street & Speers Road

Queues
3: Kerr Street & Speers Road

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

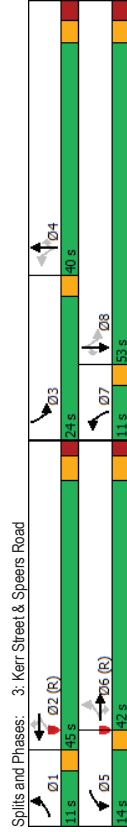
Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	7	7	7	7	7	7	7	7	7	7	7
Traffic Volume (vph)	70	735	95	195	560	165	105	115	370	325	145	95
Future Volume (vph)	70	735	95	195	560	165	105	115	370	325	145	95
Turn Type	pm-pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6	6	2	2	2	4	4	4	4	3	8
Permitted Phases	1	6	6	2	2	2	4	4	4	4	3	8
Detector Phase	1	6	6	2	2	2	4	4	4	4	3	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)	6.0	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
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
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	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	14.0	14.0
Pedestrian Calls (#/hr)	15	15	15	15	15	15	15	35	35	35	35	35

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	81	855	110	227	651	192	122	134	430	378	169	110
v/c Ratio	0.21	0.73	0.19	0.70	0.45	0.26	0.33	0.36	0.90	0.69	0.30	0.20
Control Delay	15.5	33.1	4.9	32.7	28.5	5.0	22.7	41.4	42.7	31.3	30.9	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.0	0.0
Total Delay	15.5	33.1	4.9	32.7	28.5	5.0	22.7	41.4	42.7	33.9	30.9	5.3
Queue Length 50th (m)	6.7	102.9	1.6	29.7	60.0	0.0	16.8	26.8	47.7	61.8	29.4	0.0
Queue Length 95th (m)	15.0	123.0	6.4	#66.3	80.8	13.6	24.1	39.1	75.5	73.7	40.3	9.7
Internal Link Dist (m)	145.3			474.4			103.4				143.2	
Turn Bay Length (m)	105.0		75.0	75.0		100.0	50.0		45.0	80.0		75.0
Base Capacity (vph)	394	1171	571	323	1459	745	377	517	569	547	718	655
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	0.21	0.73	0.19	0.70	0.45	0.26	0.32	0.26	0.76	0.81	0.24	0.17

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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



3: Kerr Street & Speers Road

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	7	7	7	7	7	7	7	7	7	7	7
Traffic Volume (vph)	70	735	95	195	560	165	105	115	370	325	145	95
Future Volume (vph)	70	735	95	195	560	165	105	115	370	325	145	95
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	0.93	1.00	1.00	0.95
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1799	3378	1437	1687	3438	1495	1674	1844	1429	1678	1845	1511
Flt Permitted	0.39	1.00	1.00	0.16	1.00	1.00	0.65	1.00	0.66	1.00	0.66	1.00
Satd. Flow (perm)	733	3378	1437	281	3438	1495	1146	1844	1429	997	1845	1511
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	81	855	110	227	651	192	122	134	430	378	169	110
RTOR Reduction (vph)	0	0	72	0	0	112	0	0	186	0	0	76
Lane Group Flow (vph)	81	855	38	227	651	80	122	134	244	378	169	34
Conf. Ped. (#/hr)	15	10	10	15	20	15	20	15	35	35	20	20
Heavy Vehicles (%)	0%	6%	7%	7%	5%	4%	6%	1%	5%	5%	3%	2%
Bus Blockages (#/hr)	0	4	0	0	0	0	0	5	0	0	0	0
Turn Type	pm-pt	NA	Perm	pm-pt	NA	Perm	pm-pt	NA	Perm	pm-pt	NA	Perm
Permitted Phases	1	6	5	2	2	7	4	4	3	8	8	8
Protected Phases	6	6	2	2	4	4	4	4	4	8	8	8
Actuated Green, G (s)	48.0	41.6	41.6	59.7	50.3	50.3	32.4	24.5	24.5	48.1	37.2	37.2
Effective Green, g (s)	48.0	41.6	41.6	59.7	50.3	50.3	32.4	24.5	24.5	48.1	37.2	37.2
Actuated G/C Ratio	0.40	0.35	0.35	0.50	0.42	0.42	0.27	0.20	0.20	0.40	0.31	0.31
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)	350	1171	498	316	1441	626	344	376	291	516	571	468
v/s Ratio Prot	0.01	0.25	0.03	c0.09	0.19	0.02	0.07	c0.13	0.09	0.17	0.09	0.02
v/s Ratio Perm	0.08	0.03	c0.27	0.05	0.07	0.05	0.07	c0.17	0.17	0.17	0.07	0.02
v/s Ratio	0.23	0.73	0.08	0.72	0.45	0.13	0.35	0.36	0.84	0.73	0.30	0.07
Uniform Delay, d1	22.6	34.3	26.3	21.2	25.0	21.4	34.5	41.0	45.8	28.0	31.5	29.2
Progression Factor	0.81	0.80	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	3.9	0.3	7.1	1.0	0.4	0.5	0.8	19.3	5.0	0.4	0.1
Delay (s)	18.5	31.4	20.0	28.3	26.0	21.8	34.9	41.8	65.1	33.0	31.8	29.3
Level of Service	B	C	B	C	C	C	C	D	E	C	C	C
Approach Delay (s)	C	C	C	C	C	C	C	E	E	C	C	C
Approach LOS	C	C	C	C	C	C	C	E	E	C	C	C
Intersection Summary	HCM 2000 Control Delay											
HCM 2000 Control Delay	33.8											
HCM 2000 Volume to Capacity ratio	0.77											
Actuated Cycle Length (s)	120.0											
Intersection Capacity Utilization	81.1%											
Analysis Period (min)	15											
c Critical Lane Group	E											

4: Dorval Road & Speers Road

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4
Traffic Volume (vph)	415	580	40	75	390	285	70	830	275	525	255	255
Future Volume (vph)	415	580	40	75	390	285	70	830	275	525	255	255
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm-pt	NA	pm-pt	NA	pm	Perm
Protected Phases	7	4	4	3	8	8	2	2	1	6	6	6
Detector Phases	7	4	4	3	8	8	1	5	2	1	6	6
Switch Phase	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	7.0	20.0	20.0	20.0
Minimum Initial (s)	11.0	42.0	42.0	11.0	42.0	11.0	11.0	40.0	11.0	40.0	40.0	40.0
Minimum Split (s)	21.0	50.0	50.0	13.0	42.0	12.0	11.0	45.0	12.0	46.0	46.0	46.0
Total Split (%)	17.5%	41.7%	41.7%	10.8%	35.0%	10.0%	9.2%	37.5%	10.0%	38.3%	38.3%	38.3%
Maximum Green (s)	17.0	43.0	43.0	9.0	35.0	8.0	7.0	38.0	8.0	39.0	39.0	39.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	3.0	4.0	3.0	4.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	1.0	1.0	3.0	1.0	3.0	3.0	3.0
Last 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)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0	5.0
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
Recall Mode	None	None	None	None	None	None	None	C-Min	None	C-Min	C-Min	C-Min
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0
Pedestrian Calls (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5
Intersection Summary	Cycle Length: 120											
Actuated Cycle Length: 120	Actuated Cycle Length: 120											
Offset: 41 (34%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	Offset: 41 (34%), Referenced to phase 2:NBT and 6:SBTL, Start of Green											
Natural Cycle: 72s	Natural Cycle: 72s											
Control Type: Actuated-Coordinated	Control Type: Actuated-Coordinated											
Splits and Phases:	4: Dorval Road & Speers Road											
D01	13 s	13 s	13 s	13 s	13 s	13 s	13 s	13 s	13 s	13 s	13 s	13 s
D02 (R)	15 s	15 s	15 s	15 s	15 s	15 s	15 s	15 s	15 s	15 s	15 s	15 s
D03	13 s	13 s	13 s	13 s	13 s	13 s	13 s	13 s	13 s	13 s	13 s	13 s
D04	59 s	59 s	59 s	59 s	59 s	59 s	59 s	59 s	59 s	59 s	59 s	59 s
D05	11 s	11 s	11 s	11 s	11 s	11 s	11 s	11 s	11 s	11 s	11 s	11 s
D06 (R)	15 s	15 s	15 s	15 s	15 s	15 s	15 s	15 s	15 s	15 s	15 s	15 s
D07	21 s	21 s	21 s	21 s	21 s	21 s	21 s	21 s	21 s	21 s	21 s	21 s
D08	42 s	42 s	42 s	42 s	42 s	42 s	42 s	42 s	42 s	42 s	42 s	42 s

Queues
4: Dorval Road & Speers Road

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group	451	630	43	82	424	310	76	1043	299	571	277
Lane Group Flow (vph)	0.94	0.64	0.08	0.31	0.64	0.49	0.19	0.94	0.93	0.38	0.36
v/c Ratio	79.4	40.1	0.3	16.9	35.9	10.8	17.8	56.5	60.9	10.5	3.1
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	79.4	40.1	0.3	16.9	35.9	10.8	17.8	56.5	60.9	10.5	3.1
Queue Length 50th (m)	54.8	71.4	0.0	5.2	37.3	26.7	8.3	123.9	30.4	35.4	10.1
Queue Length 95th (m)	#85.1	79.0	0.0	7.8	42.6	34.2	19.6	#165.4	#141.0	45.6	16.4
Internal Link Dist (m)	412.3			472.1			621.6		494.4		
Turn Bay Length (m)	60.0		60.0	85.0		55.0	70.0		110.0		
Base Capacity (vph)	481	1192	600	276	949	639	383	1111	321	1503	761
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.53	0.07	0.30	0.45	0.49	0.19	0.94	0.93	0.38	0.36
Intersection Summary											
#	95th percentile volume exceeds capacity, queue may be longer.										
	Queue shown is maximum after two cycles.										

HCM Signalized Intersection Capacity Analysis
4: Dorval Road & Speers Road

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
Traffic Volume (vph)	415	580	40	75	390	285	70	830	130	275	525
Future Volume (vph)	415	580	40	75	390	285	70	830	130	275	525
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	0.98
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	3329	1482	1656	3256	1494	1785	3477	1687	3539	1417
Flt Permitted	0.95	1.00	1.00	0.38	1.00	1.00	0.44	1.00	0.10	1.00	1.00
Satd. Flow (perm)	3400	3329	1482	660	3256	1494	822	3477	172	3539	1417
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
Adj. Flow (vph)	451	630	43	82	424	310	76	902	141	299	571
RTOR Reduction (vph)	0	0	30	0	0	0	69	0	10	0	0
Lane Group Flow (vph)	451	630	13	82	424	241	76	1033	0	299	571
Confl. Peds. (#/hr)	5			5			5		5		5
Heavy Vehicles (%)	3%	2%	0%	9%	10%	7%	1%	2%	0%	7%	2%
Bus Blockages (#/hr)	0	2	0	0	4	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm-pt	NA	pm-pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2	1	6	
Permitted Phases			4			8		2			6
Actuated Green, G (s)	17.0	35.4	35.4	32.4	25.4	43.8	43.4	37.2	59.6	49.4	49.4
Effective Green, g (s)	17.0	35.4	35.4	32.4	25.4	43.8	43.4	37.2	58.6	49.4	49.4
Actuated g/C Ratio	0.14	0.29	0.29	0.27	0.21	0.36	0.36	0.31	0.50	0.41	0.41
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	481	982	437	236	689	545	347	1077	317	1456	583
v/s Ratio Prot	c0.13	c0.19		0.02	0.13	0.07	0.01	0.30	c0.14	0.16	
v/s Ratio Perm			0.01	0.07	0.09	0.07			c0.32		0.08
v/c Ratio	0.94	0.64	0.03	0.35	0.62	0.44	0.22	0.96	0.94	0.39	0.20
Uniform Delay, d1	51.0	36.8	30.1	33.7	42.9	28.8	25.5	40.6	35.7	24.8	22.6
Progression Factor	1.00	1.00	1.00	0.65	0.74	0.51	1.00	1.00	0.97	0.39	0.61
Incremental Delay, d2	26.0	2.0	0.1	0.9	2.3	0.6	0.3	19.1	29.5	0.6	0.6
Delay (s)	76.9	38.8	30.1	22.9	33.9	15.3	25.9	59.8	64.0	10.1	14.3
Level of Service	E	D	C	C	C	B	C	E	E	B	B
Approach Delay (s)		53.7		25.7		57.5			25.2		
Approach LOS		D		C		E			C		C
Intersection Summary											
HCM 2000 Control Delay	41.5 HCM 2000 Level of Service										
HCM 2000 Volume to Capacity ratio	0.90										
Actuated Cycle Length (s)	120.0 Sum of lost time (s)										
Intersection Capacity Utilization	86.1% ICU Level of Service										
Analysis Period (min)	15										
c Critical Lane Group											

Timings
5. St. Augustine Drive & Speers Road

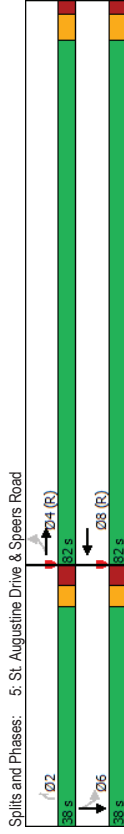
Queues
5. St. Augustine Drive & Speers Road

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	WBT	NBR	Ø6
Lane Configurations	5	4	4	4	Ø6
Traffic Volume (vph)	5	870	785	20	
Future Volume (vph)	5	870	785	20	
Turn Type	Perm	NA	NA	Perm	6
Protected Phases		4	8		
Permitted Phases	4			2	
Detector Phase	4	4	8	2	
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.9	23.9	23.9	24.3	24.3
Total Split (s)	82.0	82.0	82.0	38.0	38.0
Total Split (%)	68.3%	68.3%	68.3%	31.7%	32%
Maximum Green (s)	76.1	76.1	76.1	31.7	31.7
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	2.2	2.2	2.2	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.9	5.9	6.3	6.3
Lead/Lag					
Lead-Lag Optimize?					
Vehicle Extension (s)	3.0	3.0	3.0	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	C-Min	C-Min	C-Min	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 51 (43%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated



Lane Group	EBL	EBT	WBT	NBR
Lane Group Flow (vph)	6	1006	909	23
v/c Ratio	0.01	0.32	0.29	0.11
Control Delay	1.6	1.4	4.0	1.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	1.6	1.4	4.0	1.1
Queue Length 50th (m)	0.2	16.4	31.6	0.0
Queue Length 95th (m)	m0.3	m20.3	55.4	0.0
Internal Link Dist (m)		472.1	42.5	
Turn Bay Length (m)	50.0			
Base Capacity (vph)	542	3124	3122	514
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	0.01	0.32	0.29	0.04

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

5. St. Augustine Drive & Speers Road

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	870	15	0	785	15	0	0	20	0	0	0
Traffic Volume (vph)	5	870	15	0	785	15	0	0	20	0	0	0
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
Total Lost time (s)	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00	1.00	1.00
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
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1796	3430	3426	3426	3426	3426	3426	3426	3426	3426	3426	3426
Flt Permitted	0.31	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	593	3430	3426	3426	3426	3426	3426	3426	3426	3426	3426	3426
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	6	989	17	0	892	17	0	0	23	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	22	0	0	0
Lane Group Flow (vph)	6	1006	0	0	909	0	0	0	1	0	0	0
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	0%	5%	0%	0%	5%	0%	0%	0%	5%	0%	0%	0%
Turn Type	Perm	NA	NA	NA	NA	NA	NA	NA	Perm	Perm	NA	NA
Protected Phases	4								8			6
Permitted Phases	4								2			6
Actuated Green, G (s)	104.5	104.5	104.5	104.5	104.5	104.5	104.5	104.5	3.3	3.3	3.3	3.3
Effective Green, g (s)	104.5	104.5	104.5	104.5	104.5	104.5	104.5	104.5	3.3	3.3	3.3	3.3
Actuated G/C Ratio	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.03	0.03	0.03	0.03
Clearance Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	6.3	6.3	6.3	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	516	2986			2983				43			43
v/s Ratio Prot	c0.29				0.27							
v/s Ratio Perm	0.01				c0.00							
v/c Ratio	0.01	0.34			0.30				0.01			
Uniform Delay, d1	1.0	1.4			1.4				56.8			
Progression Factor	1.18	0.98			3.04				1.00			
Incremental Delay, d2	0.0	0.2			0.3				0.1			
Delay (s)	1.2	1.6			4.4				56.9			
Level of Service	A	A			A				E			
Approach Delay (s)	1.6	4.4			4.4				56.9			0.0
Approach LOS	A	A			A				E			A
Intersection Summary												
HCM 2000 Control Delay	3.6 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.33											
Actuated Cycle Length (s)	120.0 Sum of lost time (s)											
Intersection Capacity Utilization	38.9% ICU Level of Service											
Analysis Period (min)	15											
c Critical Lane Group												

6. Speers Road/Cornwall Road & Cross Avenue

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBT	WBT	SBL	SBR
Lane Configurations	5	1220	605	5	245	245
Traffic Volume (vph)	205	1220	605	5	245	245
Future Volume (vph)	205	1220	605	5	245	245
Turn Type	pm-plt	NA	NA	Prot	Perm	Perm
Protected Phases	5	2	6	4		
Permitted Phases	5	2	6	4		
Detector Phase	5	2	6	4		
Switch Phase						
Minimum Initial (s)	6.0	38.0	38.0	10.0	10.0	10.0
Minimum Split (s)	12.0	47.6	47.6	15.8	15.8	15.8
Total Split (s)	35.0	109.0	74.0	31.0	31.0	31.0
Total Split (%)	25.0%	77.9%	59.9%	22.1%	22.1%	22.1%
Maximum Green (s)	29.0	102.4	67.4	25.2	25.2	25.2
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3	3.3
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8	5.8
Lead/Lag	Lead	Lag	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.5	5.0	5.0	3.0	3.0	3.0
Minimum Gap (s)	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
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Min	C-Min	None	None	None
Walk Time (s)	10.0	10.0	10.0			
Flash Dont Walk (s)	31.0	31.0	31.0			
Pedestrian Calls (#/hr)	5	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: 6: Speers Road/Cornwall Road & Cross Avenue						
→ D2 (R)	109.5					
← D5		74.5				
← D6 (R)			31.5			
← D4				31.5		
← D3					31.5	
← D1						31.5

Queues
 6: Speers Road/Cornwall Road & Cross Avenue
 Future Total AM (Phase 1)
 Upper Kerr Village (8/24-01)

	EBL	EBT	WBT	SBL	SBR
Lane Group	241	1435	736	6	288
Lane Group Flow (vph)	0.42	0.49	0.29	0.05	0.63
v/c Ratio	4.3	3.9	7.2	60.6	12.9
Control Delay	0.0	0.0	0.0	0.0	0.0
Queue Delay	4.3	3.9	7.2	60.6	12.9
Total Delay	9.4	44.7	33.1	1.6	0.0
Queue Length 50th (m)	14.5	53.4	43.1	5.7	11.7
Queue Length 95th (m)	47.4	77.5	60.0		
Internal Link Dist (m)	80.0		45.0		
Turn Bay Length (m)	729	2905	2501	324	705
Base Capacity (vph)	0	0	0	0	0
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	0.33	0.49	0.29	0.02	0.41
Intersection Summary					

HCM Signalized Intersection Capacity Analysis
 6: Speers Road/Cornwall Road & Cross Avenue
 Future Total AM (Phase 1)
 Upper Kerr Village (8/24-01)

	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔
Traffic Volume (vph)	205	1220	605	20	5
Future Volume (vph)	205	1220	605	20	5
Ideal Flow (vphpl)	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
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00
Fpb. 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)	1686	3471	3450	1805	2608
Flt Permitted	0.34	1.00	1.00	0.95	1.00
Satd. Flow (perm)	589	3471	3450	1805	2608
Peak-Hour factor, PHF	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	241	1435	712	24	6
RTOR Reduction (vph)	0	0	1	0	0
Lane Group Flow (vph)	241	1435	735	0	6
Confl. Peds. (#/hr)	5		5		
Heavy Vehicles (%)	7%	4%	4%	5%	9%
Turn Type	pm>pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2			4	
Actuated Green, G (s)	117.2	117.2	101.5	10.4	10.4
Effective Green, g (s)	117.2	117.2	101.5	10.4	10.4
Actuated g/C Ratio	0.84	0.84	0.72	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)	576	2905	2501	134	193
v/s Ratio Prot	0.03	0.41	0.21	0.00	
v/c Ratio Perm	0.32			0.01	
v/c Ratio	0.42	0.49	0.29	0.04	0.11
Uniform Delay, d1	2.7	3.2	6.7	60.2	60.5
Progression Factor	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.6	0.3	0.1	0.3
Delay (s)	3.3	3.8	7.0	60.3	60.7
Level of Service	A	A	A	E	E
Approach Delay (s)	3.7	7.0	60.7		
Approach LOS	A	A	E		
Intersection Summary					
HCM 2000 Control Delay	10.8		HCM 2000 Level of Service		
HCM 2000 Volume to Capacity ratio	0.49		B		
Actuated Cycle Length (s)	140.0		Sum of lost time (s)		
Intersection Capacity Utilization	69.2%		ICU Level of Service		
Analysis Period (min)	15		C		
c Critical Lane Group					

7: Kerr Street & Prince Charles Drive

8: Kerr Street & Elmwood Road

Future Total AM (Phase 1)

Future Total AM (Phase 1)

Future Total AM (Phase 1)

Future Total AM (Phase 1)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	0	5	5	0	40	5	545	5	40	380	5
Traffic Volume (veh/h)	5	0	5	5	0	40	5	545	5	40	380	5
Future Volume (Veh/h)	5	0	5	5	0	40	5	545	5	40	380	5
Sign Control	Stop	0%	Stop	0%	0%	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	6	0	6	6	0	48	6	649	6	48	452	6
Pedestrians	15			30								
Lane Width (m)	3.6			3.6								
Walking Speed (m/s)	1.1			1.1								
Percent Blockage	1			3								
Right turn flare (veh)												
Median type							None	None	None	None	None	None
Median storage (veh)												
Upstream signal (m)							238					127
pX platoon unblocked	0.92	0.92	0.85	0.92	0.92	0.87	0.85			0.87		
VC, conflicting volume	1278	1263	470	1251	1263	682	473			685		
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	950	933	292	920	933	565	296			568		
IC, single (s)	7.1	6.5	6.5	7.1	6.5	6.3	4.3			4.2		
IC, 2 stage (s)												
p0 queue free %	3.5	4.0	3.6	3.5	4.0	3.4	2.3			2.3		
p0 queue free %	97	100	99	97	100	89	99			94		
CM capacity (veh/h)	179	221	571	206	221	434	1001			833		
Direction_Lane #	EB 1	WB 1	NB 1	SB 1	EB 1	NB 1	SB 1					
Volume Total	12	54	661	506								
Volume Left	6	6	6	48								
Volume Right	6	48	6	6								
cSH	273	386	1001	833								
Volume to Capacity	0.04	0.14	0.01	0.06								
Queue Length 95th (m)	1.0	3.7	0.1	1.4								
Control Delay (s)	18.8	15.8	0.2	1.6								
Lane LOS	C	C	A	A								
Approach Delay (s)	18.8	15.8	0.2	1.6								
Approach LOS	C	C	A	A								
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			57.1%									B
Analysis Period (min)			15									

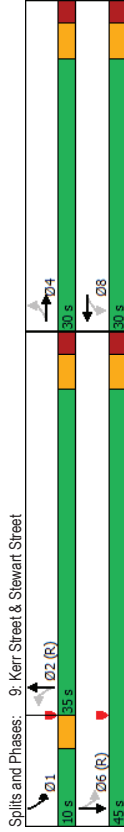
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W					
Traffic Volume (veh/h)	20	10	5	525	350	30
Future Volume (Veh/h)	20	10	5	525	350	30
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	24	12	6	618	412	35
Pedestrians	20					5
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	2			0		
Right turn flare (veh)						
Median type				None	None	None
Median storage (veh)						
Upstream signal (m)				103	262	
pX platoon unblocked	0.89	0.93	0.93			
VC, conflicting volume	1080	454	467			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	846	374	388			
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
p0 queue free %	92	98	99			
p0 queue free %	291	614	1078			
CM capacity (veh/h)						
Direction_Lane #	EB 1	NB 1	SB 1			
Volume Total	36	624	447			
Volume Left	24	6	0			
Volume Right	12	0	35			
cSH	353	1078	1700			
Volume to Capacity	0.10	0.01	0.26			
Queue Length 95th (m)	2.6	0.1	0.0			
Control Delay (s)	16.4	0.2	0.0			
Lane LOS	C	A	A			
Approach Delay (s)	16.4	0.2	0.0			
Approach LOS	C	A	A			
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			43.2%			
Analysis Period (min)			15			
						A

Timings
9: Kerr Street & Stewart Street

Future Total AM (Phase 1)
Upper Kerr Village (8724-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	35	25	20	35	5	420	40	280
Traffic Volume (vph)	35	25	20	35	5	420	40	280
Future Volume (vph)	Perm	NA	Perm	NA	Perm	NA	prn+pt	NA
Turn Type	4		8		2		1	6
Protected Phases	4		8		2		6	6
Permitted Phases	4		8		2		1	6
Detector Phase	4		8		2		1	6
Switch Phase	4		8		2		1	6
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	0.0	0.0
Total Lost Time (s)	5.4		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:NBLT and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated



Queues
9: Kerr Street & Stewart Street

Future Total AM (Phase 1)
Upper Kerr Village (8724-01)

	EBT	WBT	NBT	SBT
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	79	152	542	427
v/c Ratio	0.28	0.40	0.47	0.42
Control Delay	23.8	14.2	9.6	9.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.8	14.2	9.6	9.0
Queue Length 50th (m)	9.6	8.7	24.6	18.0
Queue Length 95th (m)	15.4	16.8	61.6	47.8
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)				
Base Capacity (vph)	459	559	1156	1028
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	0.17	0.27	0.47	0.42

Intersection Summary

9: Kerr Street & Stewart Street

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	35	25	5	20	35	70	5	420	20	40	280	30
Traffic Volume (vph)	35	25	5	20	35	70	5	420	20	40	280	30
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99	1.00	0.99
Fpb. ped/bikes	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Frt	0.97	1.00	0.99	1.00	0.99	1.00	1.00	0.99	1.00	0.99	1.00	0.99
Flt Protected	1701	1612	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775
Satd. Flow (prot)	0.79	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	0.94	1.00	0.94
Flt Permitted	1388	1532	1769	1769	1769	1769	1769	1769	1769	1769	1769	1769
Satd. Flow (perm)	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Peak-hour factor, PHF	43	30	6	24	43	85	6	512	24	49	341	37
Adj. Flow (vph)	0	5	0	0	68	0	0	1	0	0	3	0
RTOR Reduction (vph)	0	74	0	0	84	0	0	541	0	0	424	0
Lane Group Flow (vph)	20	20	20	20	20	30	20	30	35	35	30	30
Confl. Peds. (#/hr)	2%	7%	16%	0%	5%	4%	28%	6%	0%	2%	6%	6%
Heavy Vehicles (%)	0	2	0	0	2	0	0	0	0	0	0	4
Bus Blockages (#/hr)	Perm	NA	NA	Perm	NA	Perm	NA	NA	pm-pt	NA	NA	NA
Turn Type	4	8	8	2	2	2	2	2	1	6	6	6
Protected Phases	15.2	15.2	15.2	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0
Actuated Green, G (s)	0.20	0.20	0.20	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Effective Green, g (s)	4.0	4.0	4.0	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Actuated G/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Clearance Time (s)	281	310	1155	c0.31	c0.31	c0.31	c0.31	c0.31	c0.31	c0.31	c0.31	c0.31
Vehicle Extension (s)	0.05	0.26	0.27	25.2	25.2	25.2	6.5	6.2	6.2	6.2	6.2	6.2
v/s Ratio Prot	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
v/s Ratio Perm	0.7	25.9	25.9	7.9	7.9	7.9	6.4	6.4	6.4	6.4	6.4	6.4
v/c Ratio	C	C	C	A	A	A	A	A	A	A	A	A
Uniform Delay, d1	25.9	25.9	25.9	7.9	7.9	7.9	6.4	6.4	6.4	6.4	6.4	6.4
Progression Factor	C	C	C	A	A	A	A	A	A	A	A	A
Incremental Delay, d2	25.9	25.9	25.9	7.9	7.9	7.9	6.4	6.4	6.4	6.4	6.4	6.4
Level of Service	C	C	C	A	A	A	A	A	A	A	A	A
Approach Delay (s)	C	C	C	A	A	A	A	A	A	A	A	A
Approach LOS	C	C	C	A	A	A	A	A	A	A	A	A
Intersection Summary	<p>Intersection Summary</p> <p>Control Type: Actuated-Coordinated</p> <p>Actuated Cycle Length: 120</p> <p>Offset: 118 (98%), Referenced to phase 2:NETL and 6:SBT, Start of Green</p> <p>Natural Cycle: 90</p>											
HCM 2000 Control Delay	10.8 HCM 2000 Level of Service B											
HCM 2000 Volume to Capacity ratio	0.44											
Actuated Cycle Length (s)	75.0 Sum of lost time (s) 13.8											
Intersection Capacity Utilization	66.1% ICU Level of Service C											
Analysis Period (min)	15											
Critical Lane Group	c											

10: Dorval Road & Wyecroft Road

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	17.5%	33.3%	17.5%	33.3%	14.2%	35.0%	14.2%	35.0%	14.2%	35.0%	14.2%	35.0%
Traffic Volume (vph)	215	115	20	125	110	1325	150	1015	150	1015	150	1015
Future Volume (vph)	215	115	20	125	110	1325	150	1015	150	1015	150	1015
Turn Type	Prot	NA	pm-pt	NA	pm-pt	NA	Prot	NA	NA	Prot	NA	NA
Protected Phases	7	4	3	8	5	2	1	6	6	6	6	6
Detector Phase	7	4	3	8	5	2	1	6	6	6	6	6
Switch Phase	7.0	10.0	7.0	10.0	7.0	20.0	7.0	20.0	7.0	20.0	7.0	20.0
Minimum Initial (s)	12.0	25.0	12.0	25.0	12.0	41.0	12.0	41.0	12.0	41.0	12.0	41.0
Minimum Split (s)	21.0	40.0	21.0	40.0	17.0	42.0	17.0	42.0	17.0	42.0	17.0	42.0
Total Split (%)	17.5%	33.3%	17.5%	33.3%	14.2%	35.0%	14.2%	35.0%	14.2%	35.0%	14.2%	35.0%
Maximum Green (s)	16.0	33.0	16.0	33.0	12.0	35.0	12.0	35.0	12.0	35.0	12.0	35.0
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	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)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Lead/Lag	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
Recall Mode	None	None	None	None	None	None	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	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	27.0	11.0	27.0	11.0	27.0	11.0	27.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Intersection Summary	<p>Intersection Summary</p> <p>Control Type: Actuated-Coordinated</p> <p>Actuated Cycle Length: 120</p> <p>Offset: 118 (98%), Referenced to phase 2:NETL and 6:SBT, Start of Green</p> <p>Natural Cycle: 90</p>											
HCM 2000 Control Delay	10.8 HCM 2000 Level of Service B											
HCM 2000 Volume to Capacity ratio	0.44											
Actuated Cycle Length (s)	75.0 Sum of lost time (s) 13.8											
Intersection Capacity Utilization	66.1% ICU Level of Service C											
Analysis Period (min)	15											
Critical Lane Group	c											

Queues
10: Dorval Road & Wynecroft Road

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	234	239	22	381	120	1505	163	1581
v/c Ratio	0.60	0.30	0.09	0.66	0.54	0.66	0.44	0.72
Control Delay	56.6	20.8	26.6	24.4	28.0	15.7	53.6	27.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.6	20.8	26.6	24.4	28.0	15.7	53.6	27.8
Queue Length 50th (m)	27.0	11.5	3.7	17.1	8.2	90.6	18.8	101.1
Queue Length 95th (m)	40.0	24.1	9.1	31.3	13.1	128.5	28.7	140.3
Internal Link Dist (m)	155.6		199.3		494.4		672.1	
Turn Bay Length (m)	115.0		145.0		65.0		125.0	
Base Capacity (vph)	416	931	358	1032	239	2274	382	2211
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.26	0.06	0.37	0.50	0.66	0.43	0.72
Intersection Summary								
m Volume for 95th percentile queue is metered by upstream signal.								

HCM Signalized Intersection Capacity Analysis
10: Dorval Road & Wynecroft Road

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	TT	TT	T	T	TT	TT	TT	TT	TT
Traffic Volume (vph)	215	115	105	20	125	225	110	1325	60
Future Volume (vph)	215	115	105	20	125	225	110	1325	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	0.95	1.00	0.91	1.00	0.97	0.91
Fpb. ped/bikes	1.00	0.99	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.93	1.00	0.90	1.00	0.99	1.00	0.95	1.00
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	3127	3066	1637	3132	1641	5034	3433	4670	4670
Flt Permitted	0.95	1.00	0.60	1.00	0.08	1.00	0.95	1.00	0.95
Satd. Flow (perm)	3127	3066	1039	3132	138	5034	3433	4670	4670
Peak-Hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	234	125	114	22	136	245	120	1440	65
RTOR Reduction (vph)	0	87	0	0	202	0	0	3	0
Lane Group Flow (vph)	234	152	0	22	179	0	120	1502	0
Confl. Peds. (#/hr)	2	3	3	3	2	1	1	1	1
Heavy Vehicles (%)	12%	7%	9%	10%	5%	2%	10%	2%	1%
Bus Blockages (#/hr)	0	2	0	0	0	0	3	0	0
Turn Type	Prot	NA	NA	pm+pt	NA	pm+pt	NA	Prot	NA
Protected Phases	7	4	3	8	5	2	1	6	6
Permitted Phases			8		2				
Actuated Green, G (s)	14.9	28.1	21.0	17.1	62.6	51.1	12.9	52.5	52.5
Effective Green, g (s)	14.9	28.1	21.0	17.1	62.6	51.1	12.9	52.5	52.5
Actuated g/C Ratio	0.12	0.23	0.18	0.14	0.52	0.43	0.11	0.44	0.44
Clearance Time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	388	717	201	446	216	2143	369	2043	2043
v/s Ratio Prot	c0.07	0.05	0.00	c0.06	c0.05	0.30	0.05	c0.33	0.33
v/s Ratio Perm			0.02		0.24				
v/c Ratio	0.60	0.21	0.11	0.40	0.56	0.70	0.44	0.75	0.75
Uniform Delay, d1	49.8	37.0	41.4	46.8	19.2	28.2	50.2	28.2	28.2
Progression Factor	1.00	1.00	1.00	1.00	1.28	0.55	1.00	1.00	1.00
Incremental Delay, d2	3.9	0.3	0.5	1.2	2.6	1.0	1.8	2.6	2.6
Delay (s)	53.6	37.3	41.9	48.0	27.1	16.5	51.9	30.8	30.8
Level of Service	D	D	D	D	C	B	D	C	C
Approach Delay (s)		45.4		47.7		17.3		32.8	
Approach LOS		D		D		B		C	
Intersection Summary									
HCM 2000 Control Delay	29.7		HCM 2000 Level of Service		C				
HCM 2000 Volume to Capacity ratio	0.64								
Actuated Cycle Length (s)	120.0								
Sum of lost time (s)	24.0								
Intersection Capacity Utilization	72.8%								
ICU Level of Service	C								
Analysis Period (min)	15								
c Critical Lane Group									

11: Speers Road & Interim Connection

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	20	870	745	20	45	55
Future Volume (Veh/h)	20	870	745	20	45	55
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	946	810	22	49	60
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLT	TL	TWLT	TL		
Median storage (veh)	2	2				
Upstream signal (m)	66	169				
pX platoon unblocked	0.87		0.90	0.87		
vC, conflicting volume	832		1338	416		
vC1, stage 1 conf vol				821		
vC2, stage 2 conf vol				517		
vCu, unblocked vol	522		907	47		
iC, single (s)	4.1		6.8	6.9		
iC, 2 stage (s)	2.2		3.5	3.3		
p0 queue free %	98		89	93		
cM capacity (veh/h)	923		434	892		
Direction_Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1 SB 2
Volume Total	22	473	473	540	292	49 60
Volume Left	22	0	0	0	0	49 0
Volume Right	0	0	0	0	22	0 60
cSH	923	1700	1700	1700	434	892
Volume to Capacity	0.02	0.28	0.28	0.32	0.17	0.11 0.07
Queue Length 95th (m)	0.6	0.0	0.0	0.0	2.9	1.6
Control Delay (s)	9.0	0.0	0.0	0.0	14.3	9.3
Lane LOS	A				B	A
Approach Delay (s)	0.2			0.0		11.6
Approach LOS						B
Intersection Summary						
Average Delay	0.8					
Intersection Capacity Utilization	34.0%					
ICU Level of Service	A					
Analysis Period (min)	15					

14: Kerr Street & Rail Track

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

Lane Group	NBT	SBT	Ø4
Lane Configurations	↔	↔	↔
Traffic Volume (vph)	495	500	
Future Volume (vph)	495	500	
Turn Type	NA	NA	
Protected Phases	2	6	4
Permitted Phases	2	6	
Detector Phase			
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	22.0	22.0	22.0
Total Split (s)	140.0	140.0	40.0
Total Split (%)	77.8%	77.8%	22%
Maximum Green (s)	138.0	138.0	38.0
Yellow Time (s)	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	
Total Lost Time (s)	2.0	2.0	
Lead/Lag			
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0
Recall Mode	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0
Intersection Summary			
Cycle Length: 180			
Actuated Cycle Length: 180			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 45			
Control Type: Prelimed			
Splits and Phases: 14: Kerr Street & Rail Track			
Ø2 (R)	↔	↔	↔
Ø4	↔	↔	↔
Ø6 (R)	↔	↔	↔
Ø4	↔	↔	↔
Ø6 (R)	↔	↔	↔
Ø4	↔	↔	↔
Ø6 (R)	↔	↔	↔
Ø4	↔	↔	↔
Ø6 (R)	↔	↔	↔

Queues
14.: Kerr Street & Rail Track

HCM Signalized Intersection Capacity Analysis
14.: Kerr Street & Rail Track

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

Future Total AM (Phase 1)
Upper Kerr Village (8/24-01)

	NBT	SBT	SBT
Lane Group	538	543	
Lane Group Flow (vph)	0.37	0.38	
v/c Ratio	7.7	7.8	
Control Delay	55.0	0.0	
Queue Delay	62.7	7.8	
Total Delay	57.3	58.5	
Queue Length 50th (m)	73.3	75.0	
Queue Length 95th (m)	21.4	418.6	
Internal Link Dist (m)	1442	1414	
Turn Bay Length (m)	968	0	
Starvation Cap Reductn	0	0	
Spillback Cap Reductn	0	0	
Storage Cap Reductn	1.14	0.38	
Reduced v/c Ratio			
Intersection Summary			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔						↑			↓	↔
Traffic Volume (vph)	0	0	0	0	0	0	0	495	0	0	500	0
Future Volume (vph)	0	0	0	0	0	0	0	495	0	0	500	0
Ideal Flow (vphpb)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)								2.0			2.0	
Lane Util. Factor								1.00			1.00	
Ft								1.00			1.00	
Flt Protected								1.00			1.00	
Satd. Flow (prot)								1881			1845	
Flt Permitted								1.00			1.00	
Satd. Flow (perm)								1881			1845	
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)	0	0	0	0	0	0	0	538	0	0	543	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	538	0	0	543	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	3%	0%
Turn Type								NA			NA	
Protected Phases								4			2	
Permitted Phases												6
Actuated Green, G (s)								138.0			138.0	
Effective Green, g (s)								138.0			138.0	
Actuated g/C Ratio								0.77			0.77	
Clearance Time (s)								2.0			2.0	
Lane Grp Cap (vph)								1442			1414	
v/s Ratio Prot								0.29			0.29	
v/c Ratio								0.37			0.38	
Uniform Delay, d1								6.9			6.9	
Progression Factor								1.00			1.00	
Incremental Delay, d2								0.7			0.8	
Delay (s)								7.6			7.7	
Level of Service								A			A	
Approach Delay (s)								0.0	0.0		7.6	
Approach LOS								A	A		A	
Intersection Summary												
HCM 2000 Control Delay								7.7			A	
HCM 2000 Volume to Capacity ratio								0.30				
Actuated Cycle Length (s)								180.0			4.0	
Intersection Capacity Utilization								29.6%			A	
Analysis Period (min)								15				
c. Critical Lane Group												

1: Kerr Street & Wycroft Road

Future Total PM (Phase 1)
Upper Kerr Village (8/7/24-01)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	25	130	115	610	505	110
Future Volume (Veh/h)	25	130	115	610	505	110
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	27	140	124	656	543	118
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)				None	None	None
Median type						
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	1183	336	666			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	1183	336	666			
IC, single (s)	6.8	7.0	4.2			
IC, 2 stage (s)						
p0 queue free %	3.5	3.3	2.3			
CM capacity (veh/h)	83	79	86			
	159	651	889			
Direction_Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	27	140	124	328	328	362 299
Volume Left	27	0	124	0	0	0 0
Volume Right	0	140	0	0	0	0 118
cSH	159	651	889	1700	1700	1700
Volume to Capacity	0.17	0.21	0.14	0.19	0.19	0.21 0.18
Queue Length 95th (m)	4.5	6.2	3.7	0.0	0.0	0.0 0.0
Control Delay (s)	32.3	12.0	9.7	0.0	0.0	0.0 0.0
Lane LOS	D	B	A			
Approach Delay (s)	15.3		1.5			0.0
Approach LOS	C					
Intersection Summary						
Average Delay	2.3					
Intersection Capacity Utilization	37.3%					
Analysis Period (min)	15					
	ICU Level of Service A					



2: Kerr Street & Shepherd Road

Future Total PM (Phase 1)
Upper Kerr Village (8/7/24-01)

Lane Group	WBL	WBT	NBT	NBR	SBL	SBT	Ø4
Lane Configurations	↔	↔	↔	↔	↔	↔	
Traffic Volume (vph)	100	0	530	110	155	445	
Future Volume (vph)	100	0	530	110	155	445	
Turn Type	Perm	NA	NA	Perm	pm+pt	NA	
Protected Phases	8		2		1	6	4
Permitted Phases	8		2		2	6	
Detector Phase	8		2		2	1	6
Switch Phase							
Minimum Initial (s)	5.0	5.0	18.0	18.0	7.0	18.0	5.0
Minimum Split (s)	22.0	22.0	28.2	28.2	11.0	28.2	22.0
Total Split (s)	33.0	33.0	53.0	53.0	22.0	75.0	33.0
Total Split (%)	30.6%	30.6%	49.1%	49.1%	20.4%	69.4%	31%
Maximum Green (s)	29.0	29.0	47.8	47.8	18.0	69.8	29.0
Yellow Time (s)	3.0	3.0	3.3	3.3	4.0	3.3	3.0
All-Red Time (s)	1.0	1.0	1.9	1.9	0.0	1.9	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	5.2	5.2	4.0	5.2	4.0
Lead/Lag			Lag	Lag	Lead	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.5	3.5	2.5	3.5	3.0
Minimum Gap (s)	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
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	Min	Min	None	Min	None
Walk Time (s)	7.0	7.0	10.0	10.0	10.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	13.0	13.0	13.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	5	5	5	5	0
Intersection Summary							
Cycle Length	108						
Actuated Cycle Length	49.1						
Natural Cycle	65						
Control Type	Semi Ad-Uncoord						



Queues
2: Kerr Street & Shepherd Road

Future Total PM (Phase 1)
Upper Kerr Village (8/24-01)

	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group						
Lane Group Flow (vph)	103	149	546	113	160	459
v/c Ratio	0.41	0.23	0.40	0.17	0.26	0.21
Control Delay	23.4	0.8	12.5	3.7	4.9	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.3	0.1
Total Delay	23.4	0.8	12.5	3.7	5.2	4.6
Queue Length 50th (m)	7.6	0.0	16.6	0.0	4.1	7.1
Queue Length 95th (m)	20.9	0.0	31.9	7.6	11.2	14.8
Internal Link Dist (m)	241.3	143.2				21.4
Turn Bay Length (m)				50.0	50.0	
Base Capacity (vph)	794	1091	3385	1471	856	3574
Starvation Cap Reductn	0	0	0	0	348	1631
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.14	0.16	0.08	0.31	0.24
Intersection Summary						

HCM Signalized Intersection Capacity Analysis
2: Kerr Street & Shepherd Road

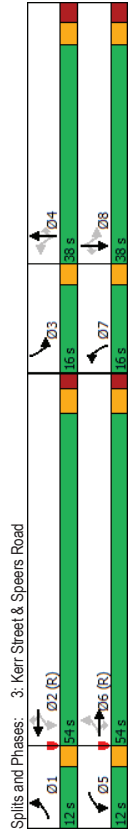
Future Total PM (Phase 1)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	0	0	0	100	0	145	0	530	110	155	445	0	
Future Volume (vph)	0	0	0	100	0	145	0	530	110	155	445	0	
Ideal Flow (vphpb)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)				4.0	4.0		5.2	5.2	5.2	4.0	5.2		
Lane Util. Factor				1.00	1.00		0.95	0.95	1.00	1.00	0.95		
Fpb. ped/bikes				1.00	0.97		1.00	0.97	1.00	1.00	1.00		
Fpb. ped/bikes				0.98	1.00		1.00	1.00	1.00	1.00	1.00		
Frt				1.00	0.85		1.00	0.85	1.00	1.00	1.00		
Flt Protected				0.95	1.00		1.00	1.00	0.95	1.00	1.00		
Satd. Flow (prot)				1717	1538		3539	1543	1804	3574			
Flt Permitted				0.76	1.00		1.00	1.00	0.36	1.00			
Satd. Flow (perm)				1368	1538		3539	1543	684	3574			
Peak-Hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	
Adj. Flow (vph)	0	0	0	103	0	149	0	546	113	160	459	0	
RTOR Reduction (vph)	0	0	0	0	121	0	0	0	69	0	0	0	
Lane Group Flow (vph)	0	0	0	103	28	0	546	44	160	459	0	0	
Confl. Peds. (#/hr)	5	15	15	5	5	5	5	5	5	5	5	5	
Heavy Vehicles (%)	0%	0%	0%	3%	0%	1%	0%	2%	0%	1%	0%	0%	
Bus Blockages (#/hr)	0	0	0	0	3	0	0	5	0	0	0	0	
Turn Type	Perm	Perm	NA	NA	NA	Perm	NA	NA	Perm	pm-pt	NA	Perm	
Protected Phases		4		8			2			1		6	
Permitted Phases	4			8	2		2		2	6		6	
Actuated Green, G (s)	9.2	9.2	9.2	9.2	9.2	9.2	19.0	19.0	30.6	30.6	30.6	30.6	
Effective Green, g (s)	9.2	9.2	9.2	9.2	9.2	9.2	19.0	19.0	30.6	30.6	30.6	30.6	
Actuated g/C Ratio	0.19	0.19	0.19	0.19	0.19	0.19	0.39	0.39	0.62	0.62	0.62	0.62	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.2	5.2	4.0	5.2	4.0	5.2	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.5	3.5	2.5	3.5	2.5	3.5	
Lane Grp Cap (vph)	256	288	288	1372	598	600	2231						
v/s Ratio Prot				0.02			0.04			0.13			
v/s Ratio Perm				0.08			0.03			0.12			
v/c Ratio	0.40	0.10	0.40	0.40	0.07	0.27	0.21			0.21			
Uniform Delay, d1	17.5	16.5	16.5	10.9	9.5	4.0	4.0			4.0			
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00			
Incremental Delay, d2	1.0	0.1	0.1	0.2	0.1	0.2	0.1			0.2			
Delay (s)	18.5	16.6	16.6	11.1	9.5	4.2	4.0			4.2			
Level of Service	B	B	B	B	A	A	A			A			
Approach Delay (s)	0.0			17.4			10.8			4.1			
Approach LOS	A			B			B			A			
Intersection Summary													
HCM 2000 Control Delay	9.2											HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37												
Actuated Cycle Length (s)	49.0											Sum of lost time (s)	13.2
Intersection Capacity Utilization	54.6%											ICU Level of Service	A
Analysis Period (min)	15												
c. Critical Lane Group													

Timings 3: Kerr Street & Speers Road Future Total PM (Phase 1) Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	85	595	135	300	935	445	150	155	235	260	240	80
Future Volume (vph)	85	595	135	300	935	445	150	155	235	260	240	80
Turn Type	pm-pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6	6	2	2	2	4	4	4	4	3	8
Permitted Phases	1	6	6	2	2	2	4	4	4	4	3	8
Detector Phase												
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	16.0	38.0	38.0	16.0	38.0	38.0
Total Split (%)	10.0%	45.0%	45.0%	10.0%	45.0%	45.0%	13.3%	31.7%	31.7%	13.3%	31.7%	31.7%
Maximum Green (s)	9.0	48.1	48.1	9.0	48.1	48.1	13.0	31.7	31.7	13.0	31.7	31.7
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
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
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	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	14.0	14.0
Pedestrian Calls (#/hr)	15	15	15	15	15	15	35	35	35	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 3: Kerr Street & Speers Road Future Total PM (Phase 1) Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	89	626	142	316	984	468	158	163	247	274	253	84
v/c Ratio	0.28	0.39	0.18	0.63	0.56	0.48	0.52	0.52	0.54	0.71	0.72	0.24
Control Delay	10.8	22.8	10.0	19.3	23.7	3.7	34.1	49.9	9.4	42.3	57.3	9.6
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	10.8	22.8	10.0	19.3	23.7	3.7	34.1	49.9	9.4	42.3	57.3	9.6
Queue Length 50th (m)	10.9	55.5	9.4	33.2	81.9	0.0	26.8	34.9	0.0	50.1	56.8	0.0
Queue Length 95th (m)	22.0	81.6	21.0	57.7	119.8	19.3	39.3	51.8	20.1	67.3	78.7	12.4
Internal Link Dist (m)	138.4			474.4			103.4					143.2
Turn Bay Length (m)	105.0		75.0	75.0		100.0	50.0		45.0	80.0		75.0
Base Capacity (vph)	340	1587	783	501	1767	975	326	495	574	384	501	458
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	0.26	0.39	0.18	0.63	0.56	0.48	0.48	0.33	0.43	0.71	0.50	0.18

Intersection Summary

3: Kerr Street & Speers Road
 HCM Signalized Intersection Capacity Analysis
 Future Total PM (Phase 1)
 Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←	←	←	←	←	←	←	←	←	←	←	←
Traffic Volume (vph)	85	595	135	300	935	445	150	155	235	260	240	80
Future Volume (vph)	85	595	135	300	935	445	150	155	235	260	240	80
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	1.00	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.93	1.00	1.00	0.98	1.00
Frb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	0.98	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.85	1.00	1.00	0.85
Satd. Flow (prot)	1802	3511	1560	1750	3539	1485	1766	1877	1486	1763	1900	1501
Flt Permitted	0.22	1.00	1.00	0.33	1.00	1.00	0.37	1.00	0.48	1.00	0.48	1.00
Satd. Flow (perm)	422	3511	1560	606	3539	1485	697	1877	1486	894	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)	80	626	142	316	984	468	158	163	247	274	253	84
RTOR Reduction (vph)	0	0	78	0	0	234	0	0	206	0	0	68
Lane Group Flow (vph)	89	626	64	316	984	234	158	163	41	274	253	16
Confl. Peds. (#/hr)	30	5	5	5	5	30	35	35	35	35	35	35
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Bus Blockages (#/hr)	0	4	0	0	0	0	0	3	0	0	0	0
Turn Types	pm-pt	NA	Perm	pm-pt	NA	Perm	pm-pt	NA	Perm	pm-pt	NA	Perm
Protected Phases	1	6	5	2	2	7	4	4	3	8	8	8
Permitted Phases	6	6	2	2	2	4	4	4	4	8	8	8
Actuated Green, G (s)	62.3	54.3	54.3	70.9	59.9	59.9	31.8	20.1	20.1	36.0	22.2	22.2
Effective Green, g (s)	62.3	54.3	54.3	70.9	59.9	59.9	31.8	20.1	20.1	36.0	22.2	22.2
Actuated G/C Ratio	0.52	0.45	0.45	0.59	0.50	0.50	0.27	0.17	0.17	0.30	0.18	0.18
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)	311	1588	705	487	1766	741	288	314	248	366	351	277
v/s Ratio Prot	0.02	0.18	0.04	c0.07	0.28	0.05	0.09	0.03	c0.09	0.13	0.01	0.13
v/s Ratio Perm	0.13	0.31	0.04	c0.31	0.16	0.16	0.09	0.03	c0.14	0.01	0.01	0.13
v/s Ratio	0.29	0.39	0.09	0.65	0.56	0.32	0.55	0.52	0.17	0.75	0.72	0.06
Uniform Delay, d1	15.4	21.9	18.8	13.3	20.8	17.9	35.9	45.5	42.8	35.7	46.0	40.3
Progression Factor	0.76	0.95	2.51	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.7	0.3	2.6	1.3	1.1	1.7	1.9	0.4	7.7	7.6	0.1
Delay (s)	12.1	21.4	47.4	15.9	22.1	19.0	37.6	47.5	43.2	43.4	53.6	40.4
Level of Service	B	C	D	B	C	B	D	D	D	D	D	D
Approach Delay (s)	24.8	C	C	C	C	C	42.9	D	D	D	47.2	D
Approach LOS	C	C	C	C	C	C	D	D	D	D	D	D
Intersection Summary												
HCM 2000 Control Delay	28.9 HCM 2000 Level of Service C											
HCM 2000 Volume to Capacity ratio	0.71											
Actuated Cycle Length (s)	120.0 Sum of lost time (s)											
Intersection Capacity Utilization	83.3% ICU Level of Service E											
Analysis Period (min)	15											
c Critical Lane Group												

4: Dorval Road & Speers Road
 Future Total PM (Phase 1)
 Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	
Lane Configurations	←	←	←	←	←	←	←	←	←	←	←	
Traffic Volume (vph)	415	510	50	170	690	510	65	625	270	695	375	
Future Volume (vph)	415	510	50	170	690	510	65	625	270	695	375	
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm+pt	NA	pm+pt	NA	Perm	
Protected Phases	7	4	3	8	1	5	2	1	6	6	6	
Detector Phases	7	4	4	3	8	1	5	2	1	6	6	
Switch Phase	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	7.0	20.0	20.0	
Minimum Initial (s)	11.0	42.0	42.0	11.0	42.0	11.0	11.0	40.0	11.0	40.0	40.0	
Minimum Split (s)	19.0	44.0	44.0	17.0	42.0	19.0	11.0	40.0	19.0	48.0	48.0	
Total Split (%)	15.8%	36.7%	36.7%	14.2%	35.0%	15.8%	9.2%	33.3%	15.8%	40.0%	40.0%	
Maximum Green (s)	15.0	37.0	37.0	13.0	35.0	15.0	7.0	33.0	15.0	41.0	41.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	3.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	1.0	1.0	3.0	1.0	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	
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lag	
Lead/Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0	
Minimum Gap (s)	3.0	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	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	0.0	
Recall Mode	None	None	None	None	None	None	None	C-Min	None	C-Min	C-Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	26.0	
Pedestrian Calls (#/hr)	5	5	5	5	5	5	5	5	5	5	5	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 17 (14%), Referenced to phase 2/NBTL and 6/SBTL, Start of Green												
Natural Cycle: 115												
Control Type: Actuated-Coordinated												



Queues
4: Dorval Road & Speers Road

Future Total PM (Phase 1)
Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group	451	554	54	185	750	554	71	761	293	755	408
Lane Group Flow (vph)	0.92	0.50	0.09	0.47	0.78	0.77	0.25	0.80	0.89	0.68	0.51
v/c Ratio	77.3	35.6	0.3	31.8	54.8	26.5	21.2	47.2	61.8	16.3	2.6
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	77.3	35.6	0.3	31.8	54.8	26.5	21.2	47.2	61.8	16.3	2.6
Queue Length 50th (m)	-59.7	56.6	0.0	29.2	77.8	42.3	9.1	86.0	30.6	63.5	6.4
Queue Length 95th (m)	#91.8	73.1	0.0	53.4	108.5	87.4	17.7	108.8	#100.9	28.0	3.2
Internal Link Dist (m)	412.3			472.1			621.6			494.4	
Turn Bay Length (m)	60.0		60.0	85.0		55.0	70.0		110.0		
Base Capacity (vph)	488	1121	589	412	1034	720	284	975	328	1297	807
Stavation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.49	0.09	0.45	0.73	0.77	0.25	0.78	0.89	0.58	0.51
Intersection Summary											
~ Volume exceeds capacity, queue is theoretically infinite.											
~ Queue shown is maximum after two cycles.											
# 95th percentile volume exceeds capacity, queue may be longer.											
# Queue shown is maximum after two cycles.											

HCM Signalized Intersection Capacity Analysis
4: Dorval Road & Speers Road

Future Total PM (Phase 1)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	
Lane Configurations	FF	FF	F	FF	FF	F	FF	FF	FF	FF	FF	
Traffic Volume (vph)	415	510	50	170	690	510	65	625	75	270	695	
Future Volume (vph)	415	510	50	170	690	510	65	625	75	270	695	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	
Fpb. ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flt Protected	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	1.00	1.00	0.85	
Satd. Flow (prot)	3433	3560	1556	1786	3546	1581	1805	3516	1787	3574	1599	
Flt Permitted	0.95	1.00	1.00	0.40	1.00	1.00	0.31	1.00	0.14	1.00	1.00	
Satd. Flow (perm)	3433	3560	1556	743	3546	1581	597	3516	267	3574	1599	
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	
Adj. Flow (vph)	451	554	54	185	750	554	71	679	82	283	755	
RTOR Reduction (vph)	0	0	37	0	0	43	0	8	0	0	0	
Lane Group Flow (vph)	451	554	17	185	750	511	71	753	0	283	755	
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5	
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	0%	1%	1%	1%	1%	
Bus Blockages (#/hr)	0	2	0	0	4	0	0	0	0	0	0	
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm-pt	NA	pm-pt	NA	Perm	
Protected Phases	7	4		3	8	1	5	2	1	6		
Permitted Phases			4	8	8	8	2		6		6	
Actuated Green, G (s)	17.1	37.7	37.7	44.2	32.4	48.6	38.1	32.3	52.5	42.7	42.7	
Effective Green, g (s)	17.1	37.7	37.7	44.2	32.4	48.6	38.1	32.3	52.5	42.7	42.7	
Actuated g/C Ratio	0.14	0.31	0.31	0.37	0.27	0.41	0.32	0.27	0.44	0.36	0.36	
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0	
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0	
Lane Grp Cap (vph)	489	1118	488	376	957	640	247	946	322	1271	568	
v/s Ratio Prot	c0.13	0.16		0.05	0.21	c0.11	0.01	0.21	c0.12	0.21		
v/s Ratio Perm			0.01	0.13	0.22	0.08		0.08	c0.28		0.11	
v/c Ratio	0.92	0.50	0.03	0.49	0.78	0.80	0.29	0.80	0.91	0.59	0.31	
Uniform Delay, d1	50.8	33.4	28.5	26.8	40.6	31.4	29.2	40.8	28.4	31.6	28.0	
Progression Factor	1.00	1.00	1.00	1.44	1.20	0.83	1.00	1.00	1.49	0.46	0.15	
Incremental Delay, d2	23.0	0.7	0.1	1.0	4.8	6.7	0.6	6.9	24.0	1.7	1.2	
Delay (s)	73.8	34.2	28.6	39.6	53.5	32.7	29.8	47.7	66.5	16.2	5.4	
Level of Service	E	C	C	D	D	C	C	D	E	B	A	
Approach Delay (s)	50.7			44.1			46.2			23.3		
Approach LOS	D			D			D			C		
Intersection Summary												
HCM 2000 Control Delay	39.6			HCM 2000 Level of Service			D					
HCM 2000 Volume to Capacity ratio	0.90											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			22.0					
Intersection Capacity Utilization	85.4%			ICU Level of Service			E					
Analysis Period (min)	15											
c. Critical Lane Group												

Timings
5. St. Augustine Drive & Speers Road

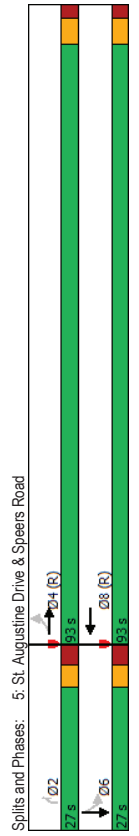
Queues
5. St. Augustine Drive & Speers Road

Future Total PM (Phase 1)
Upper Kerr Village (8724-01)

Future Total PM (Phase 1)
Upper Kerr Village (8724-01)

Lane Group	EBL	EBT	WBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	10	820	1130	25	5	0
Future Volume (vph)	10	820	1130	25	5	0
Turn Type	Perm	NA	NA	Perm	NA	NA
Protected Phases	4		8		6	
Permitted Phases	4		8		6	
Detector Phase	4		8		6	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.9	23.9	23.9	24.3	24.3	24.3
Total Split (s)	93.0	93.0	93.0	27.0	27.0	27.0
Total Split (%)	77.5%	77.5%	77.5%	22.5%	22.5%	22.5%
Maximum Green (s)	87.1	87.1	87.1	20.7	20.7	20.7
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	2.2	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.9	5.9	6.3	6.3	6.3
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	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
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Min	C-Min	C-Min	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 27 (23%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated



Lane Group	EBL	EBT	WBT	NBR	SBL	SBT
Lane Group Flow (vph)	10	880	1187	26	5	10
v/c Ratio	0.03	0.27	0.37	0.09	0.06	0.05
Control Delay	1.0	0.9	2.9	0.6	55.4	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.0	0.9	2.9	0.6	55.4	0.5
Queue Length 50th (m)	0.2	9.6	90.6	0.0	1.2	0.0
Queue Length 95th (m)	m0.3	m8.8	2.0	0.0	5.3	0.0
Internal Link Dist (m)		472.1	49.4			93.6
Turn Bay Length (m)		50.0				
Base Capacity (vph)	399	3225	3240	474	311	382
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 v/c Ratio	0.03	0.27	0.37	0.05	0.02	0.03

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

5. St. Augustine Drive & Speers Road

Future Total PM (Phase 1)

Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	10	820	25	0	1130	10	0	0	25	5	0	10
Future Volume (vph)	10	820	25	0	1130	10	0	0	25	5	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9	5.9	5.9	5.9	5.9	6.3	6.3	6.3	6.3	6.3	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	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	1.00	1.00	1.00	0.86	1.00	0.85	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1800	3551	1800	3569	1800	3569	1644	1805	1615	1805	1615	1805
Flt Permitted	0.23	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	439	3551	439	3569	439	3569	1644	1805	1615	1805	1615	1805
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	10	854	26	0	1177	10	0	0	26	5	0	10
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	25	0	0	10
Lane Group Flow (vph)	5	879	0	0	1187	0	0	0	1	5	0	0
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	NA	NA	NA	NA	Perm	Perm	Perm	NA	NA	NA
Protected Phases	4						8					6
Permitted Phases	4						2					6
Actuated Green, G (s)	104.0	104.0			104.0		3.8		3.8			3.8
Effective Green, g (s)	104.0	104.0			104.0		3.8		3.8			3.8
Actuated G/C Ratio	0.87	0.87			0.87		0.03		0.03			0.03
Clearance Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	6.3		6.3			6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0
Lane Grp Cap (vph)	380	3077			3093		52		57			51
v/s Ratio Prot	0.25				c0.33							0.00
v/s Ratio Perm	0.02				0.00		0.00		c0.00			0.00
v/c Ratio	0.03	0.29			0.38		0.02		0.09			0.01
Uniform Delay, d1	1.1	1.4			1.6		56.3		56.4			56.3
Progression Factor	0.61	0.57			1.78		1.00		1.00			1.00
Incremental Delay, d2	0.1	0.2			0.3		0.1		0.7			0.0
Delay (s)	0.8	1.0			3.2		56.4		57.1			56.3
Level of Service	A	A			A		E		E			E
Approach Delay (s)	1.0				3.2		56.4		56.6			56.6
Approach LOS	A				A		E		E			E
Intersection Summary												
HCM 2000 Control Delay	3.3 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.37											
Actuated Cycle Length (s)	120.0											
Sum of lost time (s)	12.2											
Intersection Capacity Utilization	47.2%											
ICU Level of Service	A											
Analysis Period (min)	15											
Critical Lane Group	c											

6. Speers Road/Cornwall Road & Cross Avenue

Future Total PM (Phase 1)

Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	265	730	1295	10	420							
Future Volume (vph)	265	730	1295	10	420							
Turn Type	pm-plt	NA	NA	NA	Prot	Perm						
Protected Phases	5	2	2	6	4							
Permitted Phases	2			2	6	4						
Detector Phase	5	2	2	6	4	4						
Switch Phase												
Minimum Initial (s)	6.0	38.0	38.0	10.0	10.0	10.0						
Minimum Split (s)	12.0	47.6	47.6	15.8	15.8	15.8						
Total Split (s)	17.0	102.0	85.0	38.0	38.0	38.0						
Total Split (%)	12.1%	72.9%	60.7%	27.1%	27.1%	27.1%						
Maximum Green (s)	11.0	95.4	78.4	32.2	32.2	32.2						
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3	3.3						
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5	2.5						
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0						
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8	5.8						
Lead/Lag	Lead	Lag	Lag									
Lead-Lag Optimize?	Yes	Yes	Yes									
Vehicle Extension (s)	3.5	5.0	5.0	3.0	3.0	3.0						
Minimum Gap (s)	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						
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0						
Recall Mode	None	C-Min	C-Min	None	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											



Queues
6: Speers Road/Cornwall Road & Cross Avenue

Future Total PM (Phase 1)
Upper Kerr Village (8724-01)

	EBL	EBT	WBT	SBL	SBR
Lane Group	276	760	1365	10	438
Lane Group Flow (vph)	0.64	0.26	0.65	0.05	0.80
v/c Ratio	25.3	3.7	21.1	54.3	30.4
Control Delay	0.0	0.0	0.0	0.0	0.0
Queue Delay	25.3	3.7	21.1	54.3	30.4
Total Delay	29.5	21.0	120.8	2.6	21.2
Queue Length 50th (m)	65.9	36.2	161.1	7.8	40.0
Queue Length 95th (m)	474.4	77.5	60.0		
Internal Link Dist (m)	80.0		45.0		
Turn Bay Length (m)	430	2924	2109	415	859
Base Capacity (vph)	0	0	0	0	0
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	0.64	0.26	0.65	0.02	0.51
Intersection Summary					

HCM Signalized Intersection Capacity Analysis
6: Speers Road/Cornwall Road & Cross Avenue

Future Total PM (Phase 1)
Upper Kerr Village (8724-01)

	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↖	↖	↖	↖	↖
Traffic Volume (vph)	265	730	1295	15	420
Future Volume (vph)	265	730	1295	15	420
Ideal Flow (vphpb)	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
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00
Fibb. 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)	206	3610	3567	1805	2733
Peak-Hour factor, PHF	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	276	760	1349	16	438
RTOR Reduction (vph)	0	0	0	0	270
Lane Group Flow (vph)	276	760	1365	0	168
Confl. Peds. (#/hr)	5		5		
Heavy Vehicles (%)	6%	0%	1%	0%	4%
Turn Type	pm>pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2			4	
Actuated Green, G (s)	113.4	113.4	82.8	14.2	14.2
Effective Green, g (s)	113.4	113.4	82.8	14.2	14.2
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)	429	2924	2109	183	277
v/s Ratio Prot	c0.11	0.21	0.38	0.01	
v/c Ratio Perm	c0.41				c0.06
v/c Ratio	0.64	0.26	0.65	0.05	0.61
Uniform Delay, d1	24.4	3.2	18.9	56.8	60.2
Progression Factor	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.4	0.2	1.5	0.1	3.8
Delay (s)	27.9	3.4	20.5	57.0	64.0
Level of Service	C	A	C	E	E
Approach Delay (s)	9.9	20.5	63.8		
Approach LOS	A	C	E		
Intersection Summary					
HCM 2000 Control Delay		23.5		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		74.6%		ICU Level of Service	D
Analysis Period (min)		15			
c Critical Lane Group					

7: Kerr Street & Prince Charles Drive

8: Kerr Street & Elmwood Road

Future Total PM (Phase 1)

Future Total PM (Phase 1)

Upper Kerr Village (8/7/24-01)

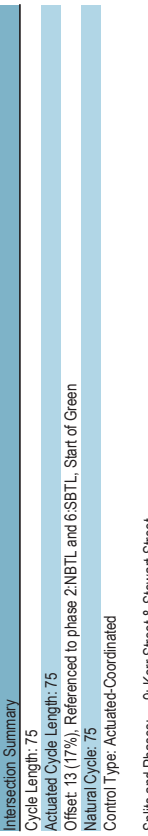
Upper Kerr Village (8/7/24-01)

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	515	10	20	640	25
Future Volume (Veh/h)	10	0	10	10	0	30	5	515	10	20	640	25
Sign Control	Stop	0%	Stop	0%	0%	Free	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	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	542	11	21	674	26
Pedestrians	20			30								5
Lane Width (m)	3.6			3.6								3.6
Walking Speed (m/s)	1.1			1.1								1.1
Percent Blockage	2			3								0
Right turn flare (veh)												
Median type							None					None
Median storage (veh)												
Upstream signal (m)								238				127
pX platoon unblocked	0.80	0.80	0.77	0.80	0.80	0.94	0.77			0.94		
VC, conflicting volume	1344	1342	707	1328	1350	582	720			583		
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	1130	1129	466	1110	1138	522	483			523		
IC, single (s)	7.1	7.0	6.2	7.1	6.5	6.2	4.3			4.1		
IC, 2 stage (s)												
p0 queue free %	3.5	4.5	3.3	3.5	4.0	3.3	2.4			2.2		
IF (s)	91	100	98	92	100	94	99			98		
CM capacity (veh/h)	126	124	452	135	150	507	747			939		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	22	43	588	721								
Volume Left	11	11	5	21								
Volume Right	11	32	11	26								
cSH	197	297	747	939								
Volume to Capacity	0.11	0.14	0.01	0.02								
Queue Length 95th (m)	2.8	3.8	0.2	0.5								
Control Delay (s)	25.6	19.2	0.2	0.6								
Lane LOS	D	C	A	A								
Approach Delay (s)	25.6	19.2	0.2	0.6								
Approach LOS	D	C	A	A								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			59.5%								B	
Analysis Period (min)			15									

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	10	5	510	600	40
Future Volume (Veh/h)	15	10	5	510	600	40
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	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	537	632	42
Pedestrians	36					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	3					
Right turn flare (veh)						
Median type			None	None	None	None
Median storage (veh)						
Upstream signal (m)				103	262	
pX platoon unblocked	0.86	0.81	0.81			
VC, conflicting volume	1235	688	709			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	939	496	522			
IC, single (s)	6.4	6.3	4.3			
IC, 2 stage (s)						
p0 queue free %	93	97	99			
IF (s)	243	437	751			
CM capacity (veh/h)						
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	27	542	674			
Volume Left	16	5	0			
Volume Right	11	0	42			
cSH	297	751	1700			
Volume to Capacity	0.09	0.01	0.40			
Queue Length 95th (m)	2.3	0.2	0.0			
Control Delay (s)	18.3	0.2	0.0			
Lane LOS	C	A	A			
Approach Delay (s)	18.3	0.2	0.0			
Approach LOS	C	A	A			
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			44.2%			A
Analysis Period (min)			15			

Timings 9: Kerr Street & Stewart Street Future Total PM (Phase 1) Upper Kerr Village (8724-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	50	10	10	15	10	390	55	490
Traffic Volume (vph)	50	10	10	15	10	390	55	490
Future Volume (vph)	Perm	NA	Perm	NA	Perm	NA	prn+pt	NA
Turn Type	4	8	8	2	2	1	6	6
Protected Phases	4	8	8	2	2	1	6	6
Permitted Phases	4	8	8	2	2	1	6	6
Detector Phase	4	8	8	2	2	1	6	6
Switch Phase	10.0	10.0	10.0	10.0	24.0	24.0	6.0	24.0
Minimum Initial (s)	30.0	30.0	30.0	30.0	32.0	32.0	10.0	32.0
Minimum Split (s)	30.0	30.0	30.0	30.0	35.0	35.0	10.0	45.0
Total Split (s)	40.0%	40.0%	40.0%	40.0%	46.7%	46.7%	13.3%	60.0%
Total Split (%)	24.6	24.6	24.6	24.6	29.6	29.6	7.0	39.6
Maximum Green (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.0	3.3
Yellow Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	2.1
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Total Lost Time (s)	Lead/Lag	Lag	Lag	Lead	Lead	Lead	Yes	Yes
Lead/Lag	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead-Lag Optimize?	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Recall Mode	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Walk Time (s)	13.0	13.0	13.0	13.0	14.0	14.0	14.0	14.0
Flash Dont Walk (s)	20	20	20	20	35	35	35	35
Pedestrian Calls (#/hr)	Intersection Summary							
Cycle Length: 75	Cycle Length: 75							
Actuated Cycle Length: 75	Actuated Cycle Length: 75							
Offset: 13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	Offset: 13 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green							
Natural Cycle: 75	Natural Cycle: 75							
Control Type: Actuated-Coordinated	Control Type: Actuated-Coordinated							



Queues 9: Kerr Street & Stewart Street Future Total PM (Phase 1) Upper Kerr Village (8724-01)

	EBT	WBT	NBT	SBT
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	81	109	451	647
v/c Ratio	0.29	0.29	0.35	0.54
Control Delay	21.6	10.0	7.9	10.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.6	10.0	7.9	10.7
Queue Length 50th (m)	8.5	3.4	18.6	32.3
Queue Length 95th (m)	16.5	13.0	55.3	98.2
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)	444	552	1297	1192
Base Capacity (vph)	0	0	0	0
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	0.18	0.20	0.35	0.54
Intersection Summary				

9: Kerr Street & Stewart Street

HCM Signalized Intersection Capacity Analysis

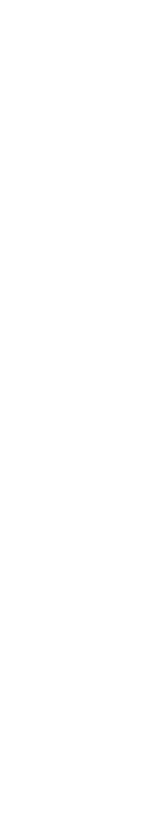
Future Total PM (Phase 1)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	50	10	15	10	15	75	10	390	15	55	490	50
Traffic Volume (vph)	50	10	15	10	15	75	10	390	15	55	490	50
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	5.4			5.4			5.4			5.4		
Total Lost time (s)												
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
Fpb. ped/bikes	0.99			0.96			1.00			1.00		0.99
Fpb. ped/bikes	0.98			1.00			1.00			1.00		1.00
Ft	0.97			0.90			1.00			1.00		0.99
Flt Protected	0.97			0.99			1.00			1.00		1.00
Satd. Flow (prot)	1661			1562			1855			1801		1801
Flt Permitted	0.77			0.97			0.98			0.93		0.93
Satd. Flow (perm)	1323			1518			1829			1678		1678
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	424	16	60	533	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	450	0	0	644	0
Confl. Peds. (#/hr)	20	15	15	20	35	20	35	25	25	25	35	35
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Bus Blockages (#/hr)	0	2	0	0	2	0	0	0	0	0	3	0
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA	NA	pm-pt	NA	NA	NA
Protected Phases	4			8			2		1		6	
Permitted Phases	4			8			2		6		6	
Actuated Green, G (s)	13.2			13.2			51.0		51.0		51.0	
Effective Green, g (s)	13.2			13.2			51.0		51.0		51.0	
Actuated G/C Ratio	0.18			0.18			0.68		0.68		0.68	
Clearance Time (s)	5.4			5.4			5.4		5.4		5.4	
Vehicle Extension (s)	4.0			4.0			4.0		4.0		4.0	
Lane Grp Cap. (vph)	232			267			1243		1141		1141	
v/s Ratio Prot												
v/s Ratio Perm	c0.05			0.03			0.25		c0.38		c0.38	
v/c Ratio	0.29			0.16			0.36		0.56		0.56	
Uniform Delay, d1	26.8			26.2			5.1		6.2		6.2	
Progression Factor	1.00			1.00			1.00		1.00		1.00	
Incremental Delay, d2	1.0			0.4			0.8		0.6		0.6	
Delay (s)	27.8			26.5			5.9		6.9		6.9	
Level of Service	C			C			A		A		A	
Approach Delay (s)	27.8			26.5			5.9		6.9		6.9	
Approach LOS	C			C			A		A		A	
Intersection Summary												
HCM 2000 Control Delay	9.5			HCM 2000 Level of Service			A		A		A	
HCM 2000 Volume to Capacity ratio	0.53											
Actuated Cycle Length (s)	75.0			Sum of lost time (s)			13.8		13.8		13.8	
Intersection Capacity Utilization	80.3%			ICU Level of Service			D		D		D	
Analysis Period (min)	15											
Critical Lane Group												

10: Donval Road & Wyecroft Road

Future Total PM (Phase 1)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	385	220	60	90	485	95	1310	120	1135		
Traffic Volume (vph)	385	220	60	90	485	95	1310	120	1135		
Future Volume (vph)	385	220	60	90	485	95	1310	120	1135		
Turn Type	Prot	NA	pm-pt	NA	pm+ov	pm-pt	NA	Prot	NA		
Protected Phases	7	4	3	8	1	5	2	1	6		
Permitted Phases	7	4	3	8	1	5	2	1	6		
Detector Phase											
Switch Phase											
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	7.0	20.0	7.0	20.0		
Minimum Split (s)	12.0	25.0	12.0	25.0	12.0	12.0	41.0	12.0	41.0		
Total Split (s)	21.0	40.0	21.0	40.0	17.0	17.0	42.0	17.0	42.0		
Total Split (%)	17.5%	33.3%	17.5%	33.3%	14.2%	14.2%	35.0%	14.2%	35.0%		
Maximum Green (s)	16.0	33.0	16.0	33.0	12.0	12.0	35.0	12.0	35.0		
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	3.0	4.0	3.0	4.0		
All-Red Time (s)	2.0	3.0	2.0	3.0	2.0	2.0	3.0	2.0	3.0		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	5.0	7.0	5.0	7.0	5.0	5.0	7.0	5.0	7.0		
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		
Minimum Gap (s)	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		
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Recall Mode	None	None	None	None	None	None	None	None	None		
Walk Time (s)	7.0			7.0			7.0		7.0		7.0
Flash Dont Walk (s)	11.0			11.0			27.0		27.0		27.0
Pedestrian Calls (#/hr)	0			0			0		0		0
Intersection Summary											
Cycle Length: 120											
Actuated Cycle Length: 120											
Offset: 103 (86%), Referenced to phase 2:NETL and 6:SBT, Start of Green											
Natural Cycle: 90											
Control Type: Actuated-Coordinated											



Queues
10: Dorval Road & Wynecroft Road

Future Total PM (Phase 1)
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group	418	418	65	98	527	103	1467	130	1462
Lane Group Flow (vph)	0.98	0.57	0.22	0.47	0.89	0.42	0.85	0.18	0.64
v/c Ratio	90.1	30.8	30.4	55.4	46.8	13.8	37.5	39.5	27.3
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	90.1	30.8	30.4	55.4	46.8	13.8	37.5	39.5	27.3
Total Delay	51.2	30.1	11.0	21.9	89.9	8.2	135.2	12.6	91.3
Queue Length 50th (m)	#82.7	45.1	19.8	36.6	127.6	m11.4	m#60.4	21.8	126.8
Queue Length 95th (m)	155.6		199.3			494.4		672.1	
Internal Link Dist (m)	115.0	145.0			65.0		125.0		
Turn Bay Length (m)	428	1004	369	474	593	270	1735	705	2274
Base Capacity (vph)	0	0	0	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.42	0.18	0.21	0.89	0.38	0.85	0.18	0.64

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
10: Dorval Road & Wynecroft Road

Future Total PM (Phase 1)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	HT	HT	HT	F	F	F	HT	HT	HT	HT	HT	HT
Traffic Volume (vph)	385	220	165	60	90	485	95	1310	40	120	1135	210
Future Volume (vph)	385	220	165	60	90	485	95	1310	40	120	1135	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	5.0	5.0	7.0	5.0	5.0	7.0	5.0	7.0	5.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.97	0.91	0.97	0.91
Fpb. ped/bikes	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94	1.00	1.00	0.85	1.00	1.00	0.95	1.00	0.95	1.00	0.98
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	3213	3234	1783	1727	1590	1736	5041	3502	4968	3502	4968	3502
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (perm)	3213	3234	953	1727	1590	248	5041	3502	4968	3502	4968	3502
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)	418	239	179	65	98	527	103	1424	43	130	1234	228
RTOR Reduction (vph)	0	128	0	0	0	55	0	3	0	0	17	0
Lane Group Flow (vph)	418	290	0	65	98	472	103	1464	0	130	1445	0
Confl. Peds. (#/hr)	1	4	4	4	4	1	1	1	1	1	1	1
Heavy Vehicles (%)	9%	4%	2%	1%	10%	1%	4%	2%	2%	0%	1%	5%
Bus Blockages (#/hr)	0	2	0	0	0	0	0	3	0	0	0	0
Turn Type	Prot	NA	NA	pm-pt	NA	pm-ov	pm-pt	NA	Prot	NA	Prot	NA
Protected Phases	7	4		3	8	1	5	2		1		6
Permitted Phases				8		8		2				
Actuated Green, G (s)	16.0	22.6	24.6	15.6	39.8	51.1	40.2	24.2	53.5	24.2	53.5	53.5
Effective Green, g (s)	16.0	22.6	24.6	15.6	39.8	51.1	40.2	24.2	53.5	24.2	53.5	53.5
Actuated g/C Ratio	0.13	0.19	0.21	0.13	0.33	0.43	0.34	0.20	0.45	0.20	0.45	0.45
Clearance Time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	428	609	257	224	527	240	1688	706	2214	706	2214	2214
v/s Ratio Prot	c0.13	0.09	0.02	0.06	c0.18	0.04	c0.29	0.04	0.29	0.04	0.29	0.29
v/s Ratio Perm			0.03		0.12		0.14					
v/c Ratio	0.98	0.48	0.25	0.44	0.90	0.43	0.87	0.18	0.65	0.18	0.65	0.65
Uniform Delay, d1	51.8	43.4	39.4	48.2	38.1	21.4	37.4	39.7	26.0	39.7	26.0	26.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	0.77	0.90	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	37.4	1.2	1.1	2.8	18.7	1.4	3.6	0.3	1.5	0.3	1.5	1.5
Delay (s)	89.2	44.6	40.4	51.0	56.8	17.9	37.4	40.0	27.5	40.0	27.5	27.5
Level of Service	F	D	D	D	E	B	D	D	C	D	C	C
Approach Delay (s)												
Approach LOS		E			D		D					C

Intersection Summary
HCM 2000 Control Delay 41.7 HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio 0.90
Actuated Cycle Length (s) 120.0 Sum of lost time (s) 24.0
Intersection Capacity Utilization 83.6% ICU Level of Service E
Analysis Period (min) 15
c Critical Lane Group

11: Speers Road & Interim Connection

Future Total PM (Phase 1)
Upper Kerr Village (8/7/24-01)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	45	805	1095	65	30	45
Future Volume (Veh/h)	45	805	1095	65	30	45
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	875	1190	71	33	49
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLT	TL	TWLT	TL		
Median storage (veh)	2	2				
Upstream signal (m)	73	162				
pX platoon unblocked	0.80		0.82	0.80		
vC, conflicting volume	1261		1761	630		
vC1, stage 1 conf vol			1226			
vC2, stage 2 conf vol			536			
vCu, unblocked vol	838		1283	55		
iC, single (s)	4.1		6.8	6.9		
iC, 2 stage (s)	2.2		3.5	3.3		
p0 queue free %	92		89	94		
cM capacity (veh/h)	648		295	810		
Direction_Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1 SB 2
Volume Total	49	438	438	793	468	33 49
Volume Left	49	0	0	0	0	33 0
Volume Right	0	0	0	0	71	0 49
cSH	648	1700	1700	1700	295	810
Volume to Capacity	0.08	0.26	0.26	0.47	0.28	0.11 0.06
Queue Length 95th (m)	1.9	0.0	0.0	0.0	2.8	1.5
Control Delay (s)	11.0	0.0	0.0	0.0	18.7	9.7
Lane LOS	B				C	A
Approach Delay (s)	0.6			0.0		13.4
Approach LOS						B
Intersection Summary						
Average Delay	0.7					
Intersection Capacity Utilization	47.4%					
ICU Level of Service	A					
Analysis Period (min)	15					

14: Kerr Street & Rail Track

Future Total PM (Phase 1)
Upper Kerr Village (8/7/24-01)

Lane Group	NBT	SBT	Ø4
Lane Configurations	↔	↔	↔
Traffic Volume (vph)	675	600	
Future Volume (vph)	675	600	
Turn Type	NA	NA	
Protected Phases	2	6	4
Permitted Phases	2	6	
Detector Phase			
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	22.0	22.0	22.0
Total Split (s)	140.0	140.0	40.0
Total Split (%)	77.8%	77.8%	22%
Maximum Green (s)	138.0	138.0	38.0
Yellow Time (s)	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	
Total Lost Time (s)	2.0	2.0	
Lead/Lag			
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0
Recall Mode	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0
Intersection Summary			
Cycle Length	180		
Actuated Cycle Length	180		
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 50			
Control Type: Prelimed			
Splits and Phases: 14: Kerr Street & Rail Track			
Ø2 (R)	↔		↔
Ø4	↔		↔
Ø6 (R)	↔		↔
Ø4	↔		↔
Ø6 (R)	↔		↔
Ø4	↔		↔
Ø6 (R)	↔		↔

Queues
14.: Kerr Street & Rail Track

Future Total PM (Phase 1)
Upper Kerr Village (8724-01)

	NBT	SBT
Lane Group	703	625
Lane Group Flow (vph)	0.49	0.43
v/c Ratio	9.2	8.4
Control Delay	53.0	0.0
Queue Delay	62.1	8.4
Total Delay	85.4	71.2
Queue Length 50th (m)	107.7	90.5
Queue Length 95th (m)	21.4	418.6
Internal Link Dist (m)	1442	1442
Turn Bay Length (m)	840	0
Base Capacity (vph)	0	0
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	1.17	0.43
Reduced v/c Ratio		
Intersection Summary		

Future Total PM (Phase 1)
Upper Kerr Village (8724-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔						↔			↔	
Traffic Volume (vph)	0	0	0	0	0	0	0	675	0	0	600	0
Future Volume (vph)	0	0	0	0	0	0	0	675	0	0	600	0
Ideal Flow (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)								2.0				2.0
Lane Util. Factor								1.00			1.00	
Ft								1.00			1.00	
Flt Protected								1.00			1.00	
Satd. Flow (prot)								1881			1881	
Flt Permitted								1.00			1.00	
Satd. Flow (perm)								1881			1881	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	0	0	0	0	703	0	0	625	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	703	0	0	625	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Turn Type								NA			NA	
Protected Phases		4						2			6	
Permitted Phases												
Actuated Green, G (s)								138.0			138.0	
Effective Green, g (s)								138.0			138.0	
Actuated g/C Ratio								0.77			0.77	
Clearance Time (s)								2.0			2.0	
Lane Grp Cap (vph)								1442			1442	
v/s Ratio Prot								d0.37			0.33	
v/c Ratio								0.49			0.43	
Uniform Delay, d1								7.8			7.3	
Progression Factor								1.00			1.00	
Incremental Delay, d2								1.2			1.0	
Delay (s)								9.0			8.3	
Level of Service								A			A	
Approach Delay (s)		0.0		0.0				9.0			8.3	
Approach LOS		A		A				A			A	
Intersection Summary												
HCM 2000 Control Delay			8.7					HCM 2000 Level of Service			A	
HCM 2000 Volume to Capacity ratio			0.38									
Actuated Cycle Length (s)			180.0					Sum of lost time (s)			4.0	
Intersection Capacity Utilization			38.9%					ICU Level of Service			A	
Analysis Period (min)			15									
c. Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
 1: Kerr Street & Wycroft Road

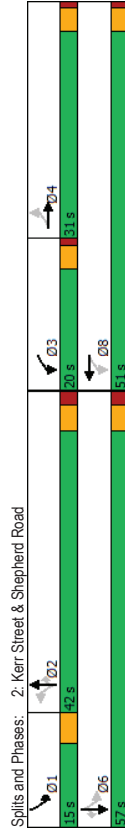
Future Total AM (Phase 2)
 Upper Kerr Village (8/24-01)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	5	90	200	325	475	125
Traffic Volume (veh/h)	5	90	200	325	475	125
Future Volume (Veh/h)	5	90	200	325	475	125
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	5	96	213	346	505	133
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)				None	None	None
Median type						
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	1170	319	638			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	1170	319	638			
IC, single (s)	6.8	7.0	4.1			
IC, 2 stage (s)	3.5	3.3	2.2			
p0 queue free %	97	86	77			
CM capacity (veh/h)	146	674	942			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	5	96	213	173	173	337 301
Volume Left	5	0	213	0	0	0 0
Volume Right	0	96	0	0	0	0 133
cSH	146	674	942	1700	1700	1700 1700
Volume to Capacity	0.03	0.14	0.23	0.10	0.10	0.20 0.18
Queue Length 95th (m)	0.8	3.8	6.6	0.0	0.0	0.0 0.0
Control Delay (s)	30.5	11.2	9.9	0.0	0.0	0.0 0.0
Lane LOS	D	B	A			
Approach Delay (s)	12.2		3.8			0.0
Approach LOS	B					
Intersection Summary						
Average Delay	2.6					
Intersection Capacity Utilization	41.5%					
ICU Level of Service	A					
Analysis Period (min)	15					

Timings
 2: Kerr Street & Shepherd Road

Future Total AM (Phase 2)
 Upper Kerr Village (8/24-01)

Lane Group	WBL	WBT	NBT	NBR	SBL	SBT	Ø4
Lane Configurations	←	←	←	←	←	←	
Traffic Volume (vph)	120	0	300	70	90	420	
Future Volume (vph)	120	0	300	70	90	420	
Turn Type	pm+pt	NA	NA	Perm	pm+pt	NA	
Protected Phases	3	8	2		1	6	4
Permitted Phases	8			2	6		
Detector Phase	3	8	2	2	1	6	
Switch Phase							
Minimum Initial (s)	5.0	5.0	18.0	18.0	7.0	18.0	5.0
Minimum Split (s)	9.0	22.0	28.2	28.2	11.0	28.2	22.0
Total Split (s)	20.0	51.0	42.0	42.0	15.0	57.0	31.0
Total Split (%)	18.5%	47.2%	38.9%	38.9%	13.9%	52.8%	29%
Maximum Green (s)	16.0	47.0	36.8	36.8	11.0	51.8	27.0
Yellow Time (s)	3.0	3.0	3.3	3.3	4.0	3.3	3.0
All-Red Time (s)	1.0	1.0	1.9	1.9	0.0	1.9	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	5.2	5.2	4.0	5.2	4.0
Lead/Lag	Lead	Lead	Lag	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.5	3.5	2.5	3.5	3.0
Minimum Gap (s)	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
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	Min	Min	None	Min	None
Walk Time (s)	7.0	10.0	10.0	10.0	10.0	7.0	
Flash Dont Walk (s)	11.0	13.0	13.0	13.0	13.0	11.0	
Pedestrian Calls (#/hr)	0	5	5	5	5	0	
Intersection Summary							
Cycle Length	108						
Actuated Cycle Length	45.7						
Natural Cycle	75						
Control Type	Semi Act-Uncooord						



Queues
2: Kerr Street & Shepherd Road

Future Total AM (Phase 2)
Upper Kerr Village (8/24-01)

	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group	132	236	330	77	99	462
Lane Group Flow (vph)	0.41	0.35	0.22	0.11	0.14	0.22
v/c Ratio	22.0	1.4	10.2	2.9	4.0	4.5
Control Delay	0.0	0.0	0.0	0.0	0.7	0.1
Queue Delay	22.0	1.4	10.2	2.9	4.7	4.6
Total Delay	9.7	0.0	9.3	0.0	2.4	7.0
Queue Length 50th (m)	23.9	0.0	17.5	4.9	6.9	14.0
Queue Length 95th (m)	241.3	0.0	143.2	0.0	0.0	21.4
Internal Link Dist (m)				50.0	50.0	
Turn Bay Length (m)	602	1510	2811	1215	771	3462
Base Capacity (vph)	0	0	0	0	462	1587
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 v/c Ratio	0.22	0.16	0.12	0.06	0.32	0.25
Intersection Summary						

HCM Signalized Intersection Capacity Analysis
2: Kerr Street & Shepherd Road

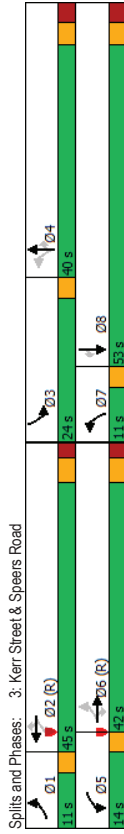
Future Total AM (Phase 2)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Traffic Volume (vph)	0	0	0	120	0	215	0	300	70	90	420	0
Future Volume (vph)	0	0	0	120	0	215	0	300	70	90	420	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0			5.2	5.2	4.0	5.2	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Fpb. ped/bikes				1.00	0.97			1.00	0.97	1.00	1.00	
Fpb. ped/bikes				1.00	1.00			1.00	1.00	1.00	1.00	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	0.85	1.00	0.95	
Satd. Flow (prot)				1664	1559			3497	1499	1785	3505	
Flt Permitted				0.73	1.00			1.00	1.00	0.46	1.00	
Satd. Flow (perm)				1274	1559			3497	1499	861	3505	
Peak-Hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	132	0	236	0	330	77	99	462	0
RTOR Reduction (vph)	0	0	0	0	0	177	0	0	0	47	0	0
Lane Group Flow (vph)	0	0	0	132	59	0	0	330	30	99	462	0
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	0%	0%	0%	8%	0%	0%	0%	2%	5%	1%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	2	0	6	0	0	0	0
Turn Type	Perm	Perm	pm-pt	NA	NA	Perm	NA	NA	Perm	pm-pt	NA	Perm
Protected Phases		4		3	8		2			1		6
Permitted Phases	4			8		2			2	6		6
Actuated Green, G (s)	12.6	12.6	12.6	12.6	12.6	12.6	19.4	19.4	19.4	28.7	28.7	28.7
Effective Green, g (s)	12.6	12.6	12.6	12.6	12.6	12.6	19.4	19.4	19.4	28.7	28.7	28.7
Actuated G/C Ratio	0.25	0.25	0.25	0.38	0.38	0.38	0.38	0.38	0.38	0.57	0.57	0.57
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	5.2	5.2	4.0	5.2	5.2	5.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.5	3.5	3.5	2.5	3.5	3.5
Lane Grp Cap (vph)	372	388	372	388	388	372	575	575	575	586	1991	586
v/s Ratio Prot	c0.05	c0.04	c0.05	c0.04	c0.04	c0.05	0.09	0.09	0.02	0.02	c0.13	0.08
v/s Ratio Perm	c0.04		c0.04			c0.04	0.02	0.02	0.02	0.08	0.02	0.08
v/c Ratio	0.35	0.15	0.35	0.15	0.15	0.15	0.25	0.25	0.05	0.17	0.23	0.23
Uniform Delay, d1	15.5	14.8	15.5	14.8	14.8	15.5	10.6	9.8	5.2	5.4	5.4	5.4
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	0.6	0.2	0.6	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Delay (s)	16.1	15.0	16.1	15.0	15.0	16.1	10.7	9.8	5.3	5.5	5.5	5.5
Level of Service	B	B	B	B	B	B	B	B	A	A	A	A
Approach Delay (s)				15.4	15.4		10.5	10.5	5.4	5.4		5.4
Approach LOS				B	B		B	B	A	A		A
Intersection Summary												
HCM 2000 Control Delay				9.7	9.7		HCM 2000 Level of Service					A
HCM 2000 Volume to Capacity ratio				0.33	0.33							
Actuated Cycle Length (s)				50.5	50.5		Sum of lost time (s)					17.2
Intersection Capacity Utilization				56.0%	56.0%		ICU Level of Service					B
Analysis Period (min)				15	15							
c Critical Lane Group												

Timings 3: Kerr Street & Speers Road Future Total AM (Phase 2) Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	90	770	100	195	570	165	105	115	370	325	150	105
Traffic Volume (vph)	110	420	420	140	450	450	110	400	400	240	530	530
Future Volume (vph)	90	770	100	195	570	165	105	115	370	325	150	105
Turn Type	pm-pt	NA	Perm	pm-pt	NA	Perm	pm-pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	6	6	2	2	2	4	4	4	3	8	8
Permitted Phases	1	6	6	2	2	2	7	7	7	4	3	8
Detector Phase	1	6	6	2	2	2	4	4	4	4	3	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
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
Recall Mode	None	C-Min	None	None	C-Min	None	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

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



Queues 3: Kerr Street & Speers Road Future Total AM (Phase 2) Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	105	895	116	227	663	192	122	134	430	378	174	122
v/c Ratio	0.30	0.80	0.21	0.76	0.49	0.27	0.29	0.30	0.91	0.76	0.29	0.21
Control Delay	18.5	39.0	5.8	40.7	31.0	5.1	21.0	37.5	49.8	59.2	29.6	5.1
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	18.5	39.0	5.8	40.7	31.0	5.1	21.0	37.5	49.8	59.2	29.6	5.1
Queue Length 50th (m)	9.5	111.0	1.5	31.8	65.8	0.0	15.7	24.8	61.3	44.3	28.8	0.0
Queue Length 95th (m)	19.4	130.2	7.9	76.2	82.5	13.6	24.1	39.1	98.3	56.1	41.5	10.3
Internal Link Dist (m)		145.3		474.4			103.4				143.2	
Turn Bay Length (m)	105.0		75.0	75.0		100.0	50.0		45.0	80.0		75.0
Base Capacity (vph)	359	1116	551	297	1342	700	418	519	523	583	718	662
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	0.29	0.80	0.21	0.76	0.49	0.27	0.29	0.26	0.82	0.65	0.24	0.18

Intersection Summary
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

3: Kerr Street & Speers Road

Future Total AM (Phase 2)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	90	770	100	195	570	165	105	115	370	325	150	105
Traffic Volume (vph)	90	770	100	195	570	165	105	115	370	325	150	105
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flap. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flap. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1800	3378	1437	1687	3438	1495	1674	1844	1429	3335	1845	1511
Flt Permitted	0.95	1.00	1.00	0.13	1.00	1.00	0.65	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	671	3378	1437	225	3438	1495	1141	1844	1429	3335	1845	1511
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	105	895	116	227	663	192	122	134	430	378	174	122
RTOR Reduction (vph)	0	0	77	0	0	117	0	0	127	0	0	82
Lane Group Flow (vph)	105	895	39	227	663	75	122	134	303	378	174	40
Conf. Ped. (#/hr)	15	10	10	7%	5%	4%	6%	1%	5%	5%	3%	2%
Heavy Vehicles (%)	0%	6%	7%	7%	5%	4%	6%	1%	5%	5%	3%	2%
Bus Blockages (#/hr)	0	4	0	0	0	0	0	5	0	0	0	0
Turn Type	pm-pt	NA	Perm	pm-pt	NA	Perm	pm-pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	6	5	2	2	7	4					
Permitted Phases	6	6	2	2	4	4	4					
Actuated Green, G (s)	47.5	39.6	39.6	57.7	46.8	46.8	37.0	29.2	29.2	17.9	39.3	39.3
Effective Green, g (s)	47.5	39.6	39.6	57.7	46.8	46.8	37.0	29.2	29.2	17.9	39.3	39.3
Actuated G/C Ratio	0.40	0.33	0.33	0.48	0.39	0.39	0.31	0.24	0.24	0.15	0.33	0.33
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)	339	1114	474	292	1340	583	386	448	347	497	604	494
v/s Ratio Prot	0.02	0.26	0.03	c0.10	0.19	0.02	0.07			c0.11	0.09	
v/s Ratio Perm	0.10	0.80	0.08	0.78	0.49	0.13	0.32	0.30	0.87	0.76	0.29	0.08
Uniform Delay, d1	23.4	36.7	27.7	23.4	27.7	23.5	31.0	37.0	43.6	49.0	30.0	27.9
Progression Factor	0.89	0.87	0.84	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	5.9	0.3	11.8	1.3	0.5	0.3	0.5	21.2	6.5	0.4	0.1
Delay (s)	21.1	37.7	23.7	35.2	29.0	24.0	31.3	37.6	64.9	55.5	30.3	28.0
Level of Service	C	D	C	D	C	C	C	C	E	E	C	C
Approach Delay (s)	34.7			29.4				53.6		44.0		
Approach LOS	C			C				D		D		
Intersection Summary												
HCM 2000 Control Delay	38.5 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.82											
Actuated Cycle Length (s)	120.0 Sum of lost time (s)											
Intersection Capacity Utilization	72.8% ICU Level of Service											
Analysis Period (min)	15											
Critical Lane Group	c											

4: Dorval Road & Speers Road

Future Total AM (Phase 2)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	415	605	40	80	410	315	70	860	280	545	255	
Traffic Volume (vph)	415	605	40	80	410	315	70	860	280	545	255	
Future Volume (vph)	415	605	40	80	410	315	70	860	280	545	255	
Ideal Flow (vphpl)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flap. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flap. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1800	3378	1437	1687	3438	1495	1674	1844	1429	3335	1845	1511
Flt Permitted	0.95	1.00	1.00	0.13	1.00	1.00	0.65	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	671	3378	1437	225	3438	1495	1141	1844	1429	3335	1845	1511
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	105	895	116	227	663	192	122	134	430	378	174	122
RTOR Reduction (vph)	0	0	77	0	0	117	0	0	127	0	0	82
Lane Group Flow (vph)	105	895	39	227	663	75	122	134	303	378	174	40
Conf. Ped. (#/hr)	15	10	10	7%	5%	4%	6%	1%	5%	5%	3%	2%
Heavy Vehicles (%)	0%	6%	7%	7%	5%	4%	6%	1%	5%	5%	3%	2%
Bus Blockages (#/hr)	0	4	0	0	0	0	0	5	0	0	0	0
Turn Type	pm-pt	NA	Perm	pm-pt	NA	Perm	pm-pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	6	5	2	2	7	4					
Permitted Phases	6	6	2	2	4	4	4					
Actuated Green, G (s)	47.5	39.6	39.6	57.7	46.8	46.8	37.0	29.2	29.2	17.9	39.3	39.3
Effective Green, g (s)	47.5	39.6	39.6	57.7	46.8	46.8	37.0	29.2	29.2	17.9	39.3	39.3
Actuated G/C Ratio	0.40	0.33	0.33	0.48	0.39	0.39	0.31	0.24	0.24	0.15	0.33	0.33
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)	339	1114	474	292	1340	583	386	448	347	497	604	494
v/s Ratio Prot	0.02	0.26	0.03	c0.10	0.19	0.02	0.07			c0.11	0.09	
v/s Ratio Perm	0.10	0.80	0.08	0.78	0.49	0.13	0.32	0.30	0.87	0.76	0.29	0.08
Uniform Delay, d1	23.4	36.7	27.7	23.4	27.7	23.5	31.0	37.0	43.6	49.0	30.0	27.9
Progression Factor	0.89	0.87	0.84	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	5.9	0.3	11.8	1.3	0.5	0.3	0.5	21.2	6.5	0.4	0.1
Delay (s)	21.1	37.7	23.7	35.2	29.0	24.0	31.3	37.6	64.9	55.5	30.3	28.0
Level of Service	C	D	C	D	C	C	C	C	E	E	C	C
Approach Delay (s)	34.7			29.4				53.6		44.0		
Approach LOS	C			C				D		D		
Intersection Summary												
Cycle Length	120											
Actuated Cycle Length	120											
Offset: 41 (34%), Referenced to phase 2:NBLT and 6:SBTL, Start of Green												
Natural Cycle: 135												
Control Type: Actuated-Coordinated												
Spits and Phases: 4: Dorval Road & Speers Road												
Phase 1: 13 s	Phase 2: 13 s	Phase 3: 13 s	Phase 4: 13 s	Phase 5: 13 s	Phase 6: 13 s	Phase 7: 13 s	Phase 8: 13 s	Phase 9: 13 s	Phase 10: 13 s	Phase 11: 13 s	Phase 12: 13 s	Phase 13: 13 s
Phase 14: 13 s	Phase 15: 13 s	Phase 16: 13 s	Phase 17: 13 s	Phase 18: 13 s	Phase 19: 13 s	Phase 20: 13 s	Phase 21: 13 s	Phase 22: 13 s	Phase 23: 13 s	Phase 24: 13 s	Phase 25: 13 s	Phase 26: 13 s
Phase 27: 13 s	Phase 28: 13 s	Phase 29: 13 s	Phase 30: 13 s	Phase 31: 13 s	Phase 32: 13 s	Phase 33: 13 s	Phase 34: 13 s	Phase 35: 13 s	Phase 36: 13 s	Phase 37: 13 s	Phase 38: 13 s	Phase 39: 13 s
Phase 40: 13 s	Phase 41: 13 s	Phase 42: 13 s	Phase 43: 13 s	Phase 44: 13 s	Phase 45: 13 s	Phase 46: 13 s	Phase 47: 13 s	Phase 48: 13 s	Phase 49: 13 s	Phase 50: 13 s	Phase 51: 13 s	Phase 52: 13 s
Phase 53: 13 s	Phase 54: 13 s	Phase 55: 13 s	Phase 56: 13 s	Phase 57: 13 s	Phase 58: 13 s	Phase 59: 13 s	Phase 60: 13 s	Phase 61: 13 s	Phase 62: 13 s	Phase 63: 13 s	Phase 64: 13 s	Phase 65: 13 s
Phase 66: 13 s	Phase 67: 13 s	Phase 68: 13 s	Phase 69: 13 s	Phase 70: 13 s	Phase 71: 13 s	Phase 72: 13 s	Phase 73: 13 s	Phase 74: 13 s	Phase 75: 13 s	Phase 76: 13 s	Phase 77: 13 s	Phase 78: 13 s
Phase 79: 13 s	Phase 80: 13 s	Phase 81: 13 s	Phase 82: 13 s	Phase 83: 13 s	Phase 84: 13 s	Phase 85: 13 s	Phase 86: 13 s	Phase 87: 13 s	Phase 88: 13 s	Phase 89: 13 s	Phase 90: 13 s	Phase 91: 13 s
Phase 92: 13 s	Phase 93: 13 s	Phase 94: 13 s	Phase 95: 13 s	Phase 96: 13 s	Phase 97: 13 s	Phase 98: 13 s	Phase 99: 13 s	Phase 100: 13 s	Phase 101: 13 s	Phase 102: 13 s	Phase 103: 13 s	Phase 104: 13 s
Phase 105: 13 s	Phase 106: 13 s	Phase 107: 13 s	Phase 108: 13 s	Phase 109: 13 s	Phase 110: 13 s	Phase 111: 13 s	Phase 112: 13 s	Phase 113: 13 s	Phase 114: 13 s	Phase 115: 13 s	Phase 116: 13 s	Phase 117: 13 s
Phase 118: 13 s	Phase 119: 13 s	Phase 120: 13 s	Phase 121: 13 s	Phase 122: 13 s	Phase 123: 13 s	Phase 124: 13 s	Phase 125: 13 s	Phase 126: 13 s	Phase 127: 13 s	Phase 128: 13 s	Phase 129: 13 s	Phase 130: 13 s
Phase 131: 13 s	Phase 132: 13 s	Phase 133: 13 s	Phase 134: 13 s	Phase 135: 13 s	Phase 136: 13 s	Phase 137: 13 s	Phase 138: 13 s	Phase 139: 13 s	Phase 140: 13 s	Phase 141: 13 s	Phase 142: 13 s	Phase 143: 13 s
Phase 144: 13 s	Phase 145: 13 s	Phase 146: 13 s	Phase 147: 13 s	Phase 148: 13 s	Phase 149: 13 s	Phase 150: 13 s	Phase 151: 13 s	Phase 152: 13 s	Phase 153: 13 s	Phase 154: 13 s	Phase 155: 13 s	Phase 156: 13 s
Phase 157: 13 s	Phase 158: 13 s											

Queues
4: Dorval Road & Speers Road

Future Total AM (Phase 2)
Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group	451	658	43	87	446	342	76	1076	304	592	277
Lane Group Flow (vph)	0.94	0.70	0.09	0.35	0.65	0.54	0.20	0.97	0.98	0.40	0.37
v/c Ratio	79.4	42.4	0.3	29.2	53.2	14.3	18.1	60.6	71.8	10.6	3.1
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	79.4	42.4	0.3	29.2	53.2	14.3	18.1	60.6	71.8	10.6	3.1
Queue Length 50th (m)	54.8	74.3	0.0	9.2	56.0	34.7	8.5	129.7	37.1	38.9	10.9
Queue Length 95th (m)	#85.1	83.0	0.0	17.7	75.4	63.4	19.6	#174.3	#143.3	46.8	m15.0
Internal Link Dist (m)	412.3			472.1			621.6			494.4	
Turn Bay Length (m)	60.0		60.0	85.0		55.0	70.0		110.0		
Base Capacity (vph)	481	1192	600	256	949	639	387	1111	311	1483	754
Stavation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.55	0.07	0.34	0.47	0.54	0.20	0.97	0.98	0.40	0.37

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
4: Dorval Road & Speers Road

Future Total AM (Phase 2)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	FF	FF	F	FF	FF	F	FF	FF	FF	FF	FF
Traffic Volume (vph)	415	605	40	80	410	315	70	860	130	280	445
Future Volume (vph)	415	605	40	80	410	315	70	860	130	280	445
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	0.98
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	3329	1482	1656	3256	1494	1785	3479	1687	3539	1417
Flt Permitted	0.95	1.00	1.00	0.32	1.00	1.00	0.43	1.00	0.10	1.00	1.00
Satd. Flow (perm)	3400	3329	1482	561	3256	1494	805	3479	169	3539	1417
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
Adj. Flow (vph)	451	658	43	87	446	342	76	935	141	304	592
RTOR Reduction (vph)	0	0	31	0	0	0	70	0	10	0	0
Lane Group Flow (vph)	451	658	12	87	446	272	76	1066	0	304	592
Confl. Peds. (#/hr)	5			5		5		5		5	
Heavy Vehicles (%)	3%	8%	9%	9%	10%	7%	1%	2%	0%	7%	2%
Bus Blockages (#/hr)	0	2	0	0	4	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm-pt	NA	pm-pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2	1	6	
Permitted Phases			4			8		2			6
Actuated Green, G (s)	17.0	33.8	33.8	33.8	25.3	43.0	44.2	38.0	59.7	49.5	49.5
Effective Green, g (s)	17.0	33.8	33.8	33.8	25.3	43.0	44.2	38.0	59.7	49.5	49.5
Actuated g/C Ratio	0.14	0.28	0.28	0.28	0.21	0.36	0.37	0.32	0.50	0.41	0.41
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	481	937	417	235	686	535	347	1101	307	1459	594
v/s Ratio Prot	c0.13	c0.20		0.03	0.14	0.07	0.01	0.31	c0.15	0.17	
v/s Ratio Perm			0.01	0.08	0.08	0.11	0.07		c0.35		0.08
v/c Ratio	0.94	0.70	0.03	0.37	0.65	0.51	0.22	0.97	0.99	0.41	0.20
Uniform Delay, d1	51.0	38.6	31.2	32.8	43.3	30.2	25.0	40.4	36.9	24.9	22.5
Progression Factor	1.00	1.00	1.00	1.19	1.15	0.65	1.00	1.00	0.99	0.38	0.61
Incremental Delay, d2	26.0	3.0	0.1	1.0	2.9	0.7	0.3	20.4	40.9	0.6	0.5
Delay (s)	76.9	41.6	31.3	40.1	52.5	20.3	25.3	60.8	77.5	10.0	14.3
Level of Service	E	D	C	D	D	C	C	E	E	B	B
Approach Delay (s)		55.1			38.6			58.5		28.5	
Approach LOS		E			D			E		C	

Intersection Summary	Value	Unit
HCM 2000 Control Delay	45.5	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.95	
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	87.7%	ICU Level of Service
Analysis Period (min)	15	

c Critical Lane Group

Timings
5. St. Augustine Drive & Speers Road

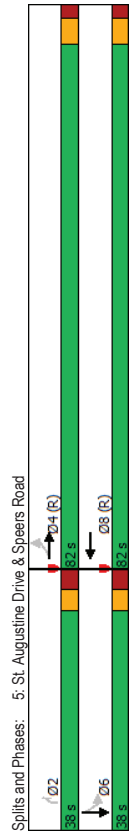
Queues
5. St. Augustine Drive & Speers Road

Future Total AM (Phase 2)
Upper Kerr Village (8724-01)

Future Total AM (Phase 2)
Upper Kerr Village (8724-01)

Lane Group	EBL	EBT	WBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	30	875	785	20	80	0
Future Volume (vph)	30	875	785	20	80	0
Turn Type	Perm	NA	NA	Perm	NA	NA
Protected Phases	4		8		6	
Permitted Phases	4		8		6	
Detector Phase	4		8		6	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.9	23.9	24.3	24.3	24.3	24.3
Total Split (s)	82.0	82.0	82.0	38.0	38.0	38.0
Total Split (%)	68.3%	68.3%	68.3%	31.7%	31.7%	31.7%
Maximum Green (s)	76.1	76.1	76.1	31.7	31.7	31.7
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	2.2	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.9	5.9	6.3	6.3	6.3
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	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
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Min	C-Min	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 51 (43%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated



Lane Group	EBL	EBT	WBT	NBR	SBL	SBT
Lane Group Flow (vph)	34	1011	898	23	91	63
v/c Ratio	0.07	0.37	0.33	0.09	0.53	0.21
Control Delay	2.1	2.1	5.8	0.6	62.3	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.1	2.1	5.8	0.6	62.3	1.5
Queue Length 50th (m)	0.8	15.0	36.6	0.0	20.8	0.0
Queue Length 95th (m)	m1.6	m21.8	48.2	0.0	35.4	0.0
Internal Link Dist (m)		472.1	42.5			93.6
Turn Bay Length (m)		50.0				
Base Capacity (vph)	469	2754	2758	512	476	550
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 v/c Ratio	0.07	0.37	0.33	0.04	0.19	0.11

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

5. St. Augustine Drive & Speers Road

Future Total AM (Phase 2)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	3	3	3	3	3	3	3	3	3	3	3	3
Traffic Volume (vph)	30	875	15	0	785	5	0	0	20	80	0	55
Future Volume (vph)	30	875	15	0	785	5	0	0	20	80	0	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9	5.9	5.9	5.9	5.9	6.3	6.3	6.3	6.3	6.3	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	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1797	3430	3434	3434	3434	3434	1565	1805	1615	1615	1615	1615
Flt Permitted	0.31	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	584	3430	3434	3434	3434	3434	1565	1805	1615	1615	1615	1615
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	34	994	17	0	892	6	0	0	23	91	0	62
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	21	0	0	57
Lane Group Flow (vph)	34	1010	0	0	898	0	0	0	2	91	6	0
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	0%	5%	0%	0%	5%	5%	0%	0%	5%	0%	0%	0%
Turn Type	Perm	NA	NA	NA	NA	NA	NA	NA	Perm	Perm	NA	NA
Protected Phases	4											6
Permitted Phases	4	96.4	96.4	96.4	96.4	96.4	11.4	11.4	11.4	11.4	11.4	11.4
Actuated Green, G (s)	96.4	96.4	96.4	96.4	96.4	96.4	11.4	11.4	11.4	11.4	11.4	11.4
Effective Green, g (s)	96.4	96.4	96.4	96.4	96.4	96.4	11.4	11.4	11.4	11.4	11.4	11.4
Actuated G/C Ratio	0.80	0.80	0.80	0.80	0.80	0.80	0.10	0.10	0.10	0.10	0.10	0.10
Clearance Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	6.3	6.3	6.3	6.3	6.3	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	469	2755			2758		148	171	153	153	153	153
v/s Ratio Prot	c0.29				0.26							0.00
v/s Ratio Perm	0.06				0.33		0.00	c0.05				0.00
v/c Ratio	0.07	0.37			0.33		0.01	0.53	0.04			0.04
Uniform Delay, d1	2.5	3.3			3.1		49.2	51.8	49.3			49.3
Progression Factor	0.62	0.52			1.63		1.00	1.00	1.00			1.00
Incremental Delay, d2	0.2	0.3			0.3		0.0	3.2	0.1			0.1
Delay (s)	1.7	2.0			5.4		49.3	54.9	49.4			49.4
Level of Service	A	A			A		D	D	D			D
Approach Delay (s)	2.0				5.4		49.3		52.7			52.7
Approach LOS	A				A		D		D			D
Intersection Summary												
HCM 2000 Control Delay	7.6 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.38											
Actuated Cycle Length (s)	120.0 Sum of lost time (s)											
Intersection Capacity Utilization	48.7% ICU Level of Service											
Analysis Period (min)	15											
c Critical Lane Group												

6. Speers Road/Cornwall Road & Cross Avenue

Future Total AM (Phase 2)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	3	3	3	3	3	3	3	3	3	3	3	3
Traffic Volume (vph)	205	1255	615	5	245	5	0	0	20	80	0	55
Future Volume (vph)	205	1255	615	5	245	5	0	0	20	80	0	55
Turn Type	pm-pt	NA	NA	NA	Prot	Perm						
Protected Phases	5	2	6	4								
Permitted Phases	5	2	6	4								
Detector Phase	5	2	6	4								
Switch Phase	6.0	38.0	38.0	10.0	10.0	10.0						
Minimum Initial (s)	12.0	47.6	47.6	15.8	15.8	15.8						
Minimum Split (s)	35.0	109.0	74.0	31.0	31.0	31.0						
Total Split (%)	25.0%	77.9%	57.9%	22.1%	22.1%	22.1%						
Maximum Green (s)	29.0	102.4	67.4	25.2	25.2	25.2						
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3	3.3						
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5	2.5						
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0						
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8	5.8						
Lead/Lag	Lead	Lag	Lag									
Lead-Lag Optimize?	Yes	Yes	Yes									
Vehicle Extension (s)	3.5	5.0	5.0	3.0	3.0	3.0						
Minimum Gap (s)	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						
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0						
Recall Mode	None	C-Min	C-Min	None	None	None						
Walk Time (s)	10.0	10.0	10.0									
Flash Dont Walk (s)	31.0	31.0	31.0									
Pedestrian Calls (#/hr)	5	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: 6: Speers Road/Cornwall Road & Cross Avenue												
→ Ø2 (R)	109.5											
→ Ø5	74.5											
→ Ø6 (R)	31.3											
→ Ø4	31.3											

Queues
6: Speers Road/Cornwall Road & Cross Avenue

Future Total AM (Phase 2)
Upper Kerr Village (8724-01)

	EBL	EBT	WBT	SBL	SBR
Lane Group	241	1476	748	6	288
Lane Group Flow (vph)	0.42	0.51	0.30	0.05	0.63
v/c Ratio	4.4	4.0	7.3	60.6	12.9
Control Delay	0.0	0.0	0.0	0.0	0.0
Queue Delay	4.4	4.0	7.3	60.6	12.9
Total Delay	9.4	46.8	33.8	1.6	0.0
Queue Length 50th (m)	14.5	55.7	44.0	5.7	11.7
Queue Length 95th (m)	474.4	77.5	60.0		
Internal Link Dist (m)	80.0		45.0		
Turn Bay Length (m)	723	2905	2501	324	705
Base Capacity (vph)	0	0	0	0	0
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	0.33	0.51	0.30	0.02	0.41
Intersection Summary					

HCM Signalized Intersection Capacity Analysis
6: Speers Road/Cornwall Road & Cross Avenue

Future Total AM (Phase 2)
Upper Kerr Village (8724-01)

	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔
Traffic Volume (vph)	205	1255	615	20	5
Future Volume (vph)	205	1255	615	20	5
Ideal Flow (vphpb)	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
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00
Fibb. 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)	1686	3471	3450	1805	2608
Flt Permitted	0.33	1.00	1.00	0.95	1.00
Satd. Flow (perm)	591	3471	3450	1805	2608
Peak-Hour factor, PHF	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	241	1476	724	24	6
RTOR Reduction (vph)	0	0	1	0	0
Lane Group Flow (vph)	241	1476	747	0	6
Confl. Peds. (#/hr)	5		5		
Heavy Vehicles (%)	7%	4%	4%	5%	9%
Turn Type	pm+pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2			4	
Actuated Green, G (s)	117.2	117.2	101.5	10.4	10.4
Effective Green, g (s)	117.2	117.2	101.5	10.4	10.4
Actuated g/C Ratio	0.84	0.84	0.72	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)	570	2905	2501	134	193
v/s Ratio Prot	0.03	c0.43	0.22	0.00	
v/s Ratio Perm	0.32			c0.01	
v/c Ratio	0.42	0.51	0.30	0.04	0.11
Uniform Delay, d1	2.8	3.2	6.8	60.2	60.5
Progression Factor	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.6	0.3	0.1	0.3
Delay (s)	3.4	3.9	7.1	60.3	60.7
Level of Service	A	A	A	E	E
Approach Delay (s)	3.8	7.1	60.7		
Approach LOS	A	A	E		
Intersection Summary					
HCM 2000 Control Delay		10.7		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio		0.50			
Actuated Cycle Length (s)		140.0		Sum of lost time (s)	18.4
Intersection Capacity Utilization		69.2%		ICU Level of Service	C
Analysis Period (min)		15			
c Critical Lane Group					

7: Kerr Street & Prince Charles Drive

8: Kerr Street & Elmwood Road

Future Total AM (Phase 2)

Future Total AM (Phase 2)

Upper Kerr Village (8/7/24-01)

Upper Kerr Village (8/7/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	5	5	0	40	5	545	5	40	390	5
Future Volume (Veh/h)	5	0	5	5	0	40	5	545	5	40	390	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	6	0	6	6	0	48	6	649	6	48	464	6
Pedestrians	15			30								
Lane Width (m)	3.6			3.6								
Walking Speed (m/s)	1.1			1.1								
Percent Blockage	1			3								
Right turn flare (veh)							None	None	None	None	None	None
Median type							None	None	None	None	None	None
Median storage (veh)												
Upstream signal (m)							238					127
pX platoon unblocked	0.91	0.91	0.85	0.91	0.91	0.87	0.85			0.87		
VC conflicting volume	1290	1275	482	1263	1275	682	485			685		
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	960	943	299	930	943	565	302			568		
IC, single (s)	7.1	6.5	6.5	7.1	6.5	6.3	4.3			4.2		
IC, 2 stage (s)												
p0 queue free %	3.5	4.0	3.6	3.5	4.0	3.4	2.3			2.3		
p0 queue free %	97	100	99	97	100	89	99			94		
CM capacity (veh/h)	176	216	563	202	216	434	989			833		
Direction_Lane #	EB 1	WB 1	NB 1	SB 1	EB 1	NB 1	SB 1					
Volume Total	12	54	661	518								
Volume Left	6	6	6	48								
Volume Right	6	48	6	6								
cSH	268	384	989	833								
Volume to Capacity	0.04	0.14	0.01	0.06								
Queue Length 95th (m)	1.1	3.7	0.1	1.4								
Control Delay (s)	19.1	15.9	0.2	1.6								
Lane LOS	C	C	A	A								
Approach Delay (s)	19.1	15.9	0.2	1.6								
Approach LOS	C	C	A	A								
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			57.6%									B
Analysis Period (min)			15									

Movement	EBL	EBR	NBL	NBT	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	10	5	525	360	30
Future Volume (Veh/h)	20	10	5	525	360	30
Sign Control	Stop	Stop	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	24	12	6	618	424	35
Pedestrians	20			5		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	2			0		
Right turn flare (veh)				None	None	None
Median type				None	None	None
Median storage (veh)						
Upstream signal (m)				103	262	
pX platoon unblocked	0.89	0.92	0.92			
VC conflicting volume	1082	466	479			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	844	378	392			
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
p0 queue free %	3.5	3.3	2.2			
p0 queue free %	92	98	99			
CM capacity (veh/h)	283	606	1065			
Direction_Lane #	EB 1	NB 1	SB 1			
Volume Total	36	624	459			
Volume Left	24	6	0			
Volume Right	12	0	35			
cSH	354	1065	1700			
Volume to Capacity	0.10	0.01	0.27			
Queue Length 95th (m)	2.6	0.1	0.0			
Control Delay (s)	16.3	0.2	0.0			
Lane LOS	C	A	A			
Approach Delay (s)	16.3	0.2	0.0			
Approach LOS	C	A	A			
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			43.2%			
Analysis Period (min)			15			
						A

Timings
9: Kerr Street & Stewart Street

Queues
9: Kerr Street & Stewart Street

Future Total AM (Phase 2)
Upper Kerr Village (8724-01)

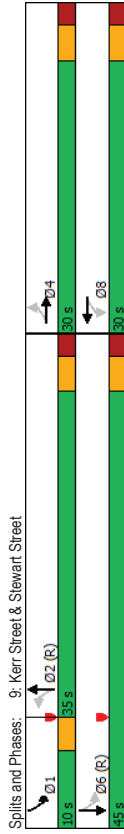
Future Total AM (Phase 2)
Upper Kerr Village (8724-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	35	25	20	35	5	420	40	290
Traffic Volume (vph)	35	25	20	35	5	420	40	290
Future Volume (vph)	Perm	NA	Perm	NA	Perm	NA	prn+pt	NA
Turn Type	4	8	8	2	2	1	6	6
Permitted Phases	4	8	8	2	2	1	6	6
Detector Phase	4	8	8	2	2	1	6	6
Switch Phase	10.0	10.0	10.0	10.0	24.0	24.0	6.0	24.0
Minimum Initial (s)	30.0	30.0	30.0	30.0	32.0	32.0	10.0	32.0
Minimum Split (s)	30.0	30.0	30.0	30.0	35.0	35.0	10.0	45.0
Total Split (s)	40.0%	40.0%	40.0%	40.0%	46.7%	46.7%	13.3%	60.0%
Total Split (%)	24.6	24.6	24.6	24.6	29.6	29.6	7.0	39.6
Maximum Green (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.0	3.3
Yellow Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	2.1
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Total Lost Time (s)	Lead/Lag	Lag	Lag	Lead	Lead	Lead	Yes	Yes
Lead/Lag	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0
Lead-Lag Optimize?	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	None	None	None	None	C-Min	C-Min	None	C-Min
Recall Mode	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Walk Time (s)	13.0	13.0	13.0	13.0	14.0	14.0	14.0	14.0
Flash Dont Walk (s)	20	20	20	20	35	35	35	35
Pedestrian Calls (#/hr)	Intersection Summary							

	EBT	WBT	NBT	SBT
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	79	152	542	440
v/c Ratio	0.28	0.40	0.47	0.43
Control Delay	23.8	14.2	9.6	9.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.8	14.2	9.6	9.2
Queue Length 50th (m)	9.6	8.7	24.6	18.8
Queue Length 95th (m)	15.4	16.8	61.6	49.6
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)	459	559	1156	1032
Base Capacity (vph)	0	0	0	0
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	0.17	0.27	0.47	0.43
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

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



9: Kerr Street & Stewart Street

Future Total AM (Phase 2)

Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	35	25	5	20	35	70	5	420	20	40	290	30
Traffic Volume (vph)	35	25	5	20	35	70	5	420	20	40	290	30
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpt)	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99	1.00	0.99
Fpb. ped/bikes	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Frt	0.97	1.00	0.99	1.00	0.99	1.00	1.00	0.99	1.00	0.99	1.00	0.99
Flt Protected	1701	1612	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775
Satd. Flow (prot)	0.79	0.94	1.00	1.00	0.94	1.00	1.00	0.94	1.00	0.94	1.00	0.94
Flt Permitted	1388	1532	1769	1769	1769	1769	1769	1769	1769	1769	1769	1769
Satd. Flow (perm)	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Peak-hour factor, PHF	43	30	6	24	43	85	6	512	24	49	354	37
Adj. Flow (vph)	0	5	0	0	68	0	0	1	0	0	3	0
RTOR Reduction (vph)	0	74	0	0	84	0	0	541	0	0	437	0
Lane Group Flow (vph)	20	20	20	20	20	30	30	35	35	35	30	30
Confl. Peds. (#/hr)	2%	7%	16%	0%	5%	4%	28%	6%	0%	2%	6%	6%
Heavy Vehicles (%)	0	2	0	0	2	0	0	0	0	0	0	4
Bus Blockages (#/hr)	Perm	NA	NA	Perm	NA	Perm	NA	NA	pm-pt	NA	NA	NA
Turn Type	4	8	2	8	2	2	1	6	6	6	6	6
Protected Phases	15.2	15.2	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0
Actuated Green, G (s)	0.20	0.20	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Effective Green, g (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Actuated G/C Ratio	281	310	1155	1155	1155	1155	1155	1155	1155	1155	1155	1155
Clearance Time (s)	0.05	0.26	0.27	0.47	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
Vehicle Extension (s)	25.2	25.2	6.5	6.5	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Lane Grp Cap. (vph)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
v/s Ratio Prot	0.7	0.6	0.6	0.6	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
v/s Ratio Perm	25.9	25.9	7.9	7.9	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
v/c Ratio	C	C	A	A	A	A	A	A	A	A	A	A
Uniform Delay, d1	25.9	25.9	7.9	7.9	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Progression Factor	C	C	A	A	A	A	A	A	A	A	A	A
Incremental Delay, d2	25.9	25.9	7.9	7.9	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Level of Service	C	C	A	A	A	A	A	A	A	A	A	A
Approach Delay (s)	C	C	A	A	A	A	A	A	A	A	A	A
Approach LOS	C	C	A	A	A	A	A	A	A	A	A	A
Intersection Summary	<p>HCM 2000 Control Delay: 10.8 HCM 2000 Level of Service: B</p> <p>HCM 2000 Volume to Capacity ratio: 0.44</p> <p>Actuated Cycle Length (s): 75.0 Sum of lost time (s): 13.8</p> <p>Intersection Capacity Utilization: 66.5% ICU Level of Service: C</p> <p>Analysis Period (min): 15</p>											
Critical Lane Group	c											

10: Donval Road & Wyecroft Road

Future Total AM (Phase 2)

Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	17	4	3	8	2	2	5	2	1	6	6	6
Traffic Volume (vph)	215	120	20	125	110	1385	150	1045	150	1045	150	1045
Future Volume (vph)	215	120	20	125	110	1385	150	1045	150	1045	150	1045
Turn Type	Prot	NA	pm-pt	NA	pm-pt	NA	Prot	NA	Prot	NA	6	6
Protected Phases	7	4	3	8	2	2	5	2	1	6	6	6
Detector Phase	7	4	3	8	2	2	5	2	1	6	6	6
Switch Phase	7.0	10.0	7.0	10.0	7.0	20.0	7.0	20.0	7.0	20.0	7.0	20.0
Minimum Initial (s)	12.0	25.0	12.0	25.0	12.0	41.0	12.0	41.0	12.0	41.0	12.0	41.0
Minimum Split (s)	21.0	40.0	21.0	40.0	17.0	42.0	17.0	42.0	17.0	42.0	17.0	42.0
Total Split (%)	17.5%	33.3%	17.5%	33.3%	14.2%	35.0%	14.2%	35.0%	14.2%	35.0%	14.2%	35.0%
Maximum Green (s)	16.0	33.0	16.0	33.0	12.0	35.0	12.0	35.0	12.0	35.0	12.0	35.0
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	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)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
Recall Mode	None	None	None	None	None	None	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	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Intersection Summary	<p>Cycle Length: 120</p> <p>Actuated Cycle Length: 120</p> <p>Offset: 118 (98%), Referenced to phase 2:NETL and 6:SBT, Start of Green</p> <p>Natural Cycle: 90</p> <p>Control Type: Actuated-Coordinated</p>											
Splits and Phases	<p>10: Donval Road & Wyecroft Road</p> <p>Ø1 17 s Ø2 (R) 42 s Ø3 21 s Ø4 40 s</p> <p>Ø5 17 s Ø6 (R) 42 s Ø7 21 s Ø8 40 s</p>											

Queues
10: Dorval Road & Wynecroft Road

Future Total AM (Phase 2)
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	234	239	22	391	120	1570	163	1614
Lane Group Flow (vph)	0.60	0.29	0.08	0.67	0.55	0.70	0.44	0.73
v/c Ratio	56.6	21.4	26.3	25.2	27.4	17.2	53.6	28.7
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	56.6	21.4	28.3	25.2	27.4	17.2	53.6	28.7
Total Delay	27.0	11.9	3.6	18.3	8.6	97.6	18.8	105.3
Queue Length 50th (m)	40.0	24.5	9.0	32.5	m12.9	m142.9	28.7	146.5
Queue Length 95th (m)	155.6			199.3	494.4		672.1	
Internal Link Dist (m)	115.0	145.0		65.0		125.0		
Turn Bay Length (m)	416	934	361	1030	237	2258	382	2197
Base Capacity (vph)	0	0	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.26	0.06	0.38	0.51	0.70	0.43	0.73
Intersection Summary								
m Volume for 95th percentile queue is metered by upstream signal.								

HCM Signalized Intersection Capacity Analysis
10: Dorval Road & Wynecroft Road

Future Total AM (Phase 2)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	TT	TT	T	T	TT	TT	TT	TT	TT
Traffic Volume (vph)	215	120	100	20	235	110	1385	60	150
Future Volume (vph)	215	120	100	20	235	110	1385	60	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	0.95	1.00	0.91	1.00	0.97	0.91
Fpb. ped/bikes	1.00	0.99	1.00	0.99	1.00	0.99	1.00	1.00	1.00
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.93	1.00	0.90	1.00	0.99	1.00	1.00	0.96
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.96
Satd. Flow (prot)	3127	3079	1637	3128	1641	5036	3433	4676	4676
Flt Permitted	0.95	1.00	0.60	1.00	0.08	1.00	0.95	1.00	0.96
Satd. Flow (perm)	3127	3079	1039	3128	136	5036	3433	4676	4676
Peak-Hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	234	130	109	22	136	255	120	1505	65
RTOR Reduction (vph)	0	83	0	0	201	0	0	3	0
Lane Group Flow (vph)	234	156	0	22	190	0	120	1567	0
Confl. Peds. (#/hr)	2	3	3	3	2	1	1	1	1
Heavy Vehicles (%)	12%	7%	9%	10%	5%	2%	10%	2%	1%
Bus Blockages (#/hr)	0	2	0	0	0	0	3	0	0
Turn Type	Prot	NA	NA	pm+pt	NA	pm+pt	NA	Prot	NA
Protected Phases	7	4	3	8	5	2	1	6	6
Permitted Phases			8		2				
Actuated Green, G (s)	14.9	28.5	21.4	17.5	62.2	50.7	12.9	52.1	52.1
Effective Green, g (s)	14.9	28.5	21.4	17.5	62.2	50.7	12.9	52.1	52.1
Actuated g/C Ratio	0.12	0.24	0.18	0.15	0.52	0.42	0.11	0.43	0.43
Clearance Time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	7.0
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	388	731	204	456	214	2127	369	2030	2030
v/s Ratio Prot	c0.07	0.05	0.00	c0.06	c0.05	0.31	0.05	c0.33	c0.33
v/s Ratio Perm			0.02		0.24				
v/c Ratio	0.60	0.21	0.11	0.42	0.56	0.74	0.44	0.77	0.77
Uniform Delay, d1	49.8	36.7	41.1	46.6	19.7	28.1	50.2	28.9	28.9
Progression Factor	1.00	1.00	1.00	1.00	1.24	0.58	1.00	1.00	1.00
Incremental Delay, d2	3.9	0.3	0.5	1.3	2.5	1.1	1.8	2.9	2.9
Delay (s)	53.6	37.1	41.6	47.9	26.8	18.0	51.9	31.8	31.8
Level of Service	D	D	D	D	C	B	D	C	C
Approach Delay (s)		45.2		47.6		18.7		33.6	
Approach LOS		D		D		B		C	
Intersection Summary									
HCM 2000 Control Delay	30.4				HCM 2000 Level of Service				C
HCM 2000 Volume to Capacity ratio	0.65								
Actuated Cycle Length (s)	120.0								
Sum of lost time (s)	24.0								
Intersection Capacity Utilization	7.37%				ICU Level of Service				D
Analysis Period (min)	15								
c Critical Lane Group									

11: Speers Road & Interim Connection

Future Total AM (Phase 2)
Upper Kerr Village (8/7/24-01)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	0	975	755	30	0	35
Future Volume (Veh/h)	0	975	755	30	0	35
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1060	821	33	0	38
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLT	TL	TWLT	TL		
Median storage (veh)	2	2				
Upstream signal (m)	66	169				
pX platoon unblocked	0.86		0.90	0.86		
vC, conflicting volume	854		1368	427		
vC1, stage 1 conf vol			838			
vC2, stage 2 conf vol			530			
vCu, unblocked vol	518		800	24		
iC, single (s)	4.1		6.8	6.9		
iC, 2 stage (s)	2.2		5.8	3.3		
p0 queue free %	100		100	96		
p0 capacity (veh/h)	915		456	910		
Direction_Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1 SB 2
Volume Total	0	530	530	547	307	0 38
Volume Left	0	0	0	0	0	0 0
Volume Right	0	0	0	0	33	0 38
cSH	1700	1700	1700	1700	1700	910
Volume to Capacity	0.00	0.31	0.31	0.32	0.18	0.11 0.04
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0 1.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0 9.1
Lane LOS						A A
Approach Delay (s)	0.0		0.0	0.0	9.1	
Approach LOS					A	
Intersection Summary						
Average Delay	0.2					
Intersection Capacity Utilization	31.8%					
ICU Level of Service	A					
Analysis Period (min)	15					

14: Kerr Street & Rail Track

Future Total AM (Phase 2)
Upper Kerr Village (8/7/24-01)

Lane Group	NBT	SBT	Ø4
Lane Configurations	↔	↔	↔
Traffic Volume (vph)	515	510	
Future Volume (vph)	515	510	
Turn Type	NA	NA	
Protected Phases	2	6	4
Permitted Phases	2	6	
Detector Phase			
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	22.0	22.0	22.0
Total Split (s)	140.0	140.0	40.0
Total Split (%)	77.8%	77.8%	22%
Maximum Green (s)	138.0	138.0	38.0
Yellow Time (s)	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	
Total Lost Time (s)	2.0	2.0	
Lead/Lag			
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0
Recall Mode	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0
Intersection Summary			
Cycle Length: 180			
Actuated Cycle Length: 180			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 45			
Control Type: Prelimed			
Splits and Phases: 14: Kerr Street & Rail Track			
Ø2 (R)	↔	↔	↔
Ø4	↔	↔	↔
Ø6 (R)	↔	↔	↔
Ø4	↔	↔	↔
Ø6 (R)	↔	↔	↔
Ø4	↔	↔	↔
Ø6 (R)	↔	↔	↔

Queues
14.: Kerr Street & Rail Track

Future Total AM (Phase 2)
Upper Kerr Village (8/24-01)

	NBT	SBT	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	560	554											
Lane Group Flow (vph)	0.39	0.39											
v/c Ratio	7.9	7.9											
Control Delay	54.7	0.0											
Queue Delay	62.6	7.9											
Total Delay	60.7	60.3											
Queue Length 50th (m)	77.5	77.1											
Queue Length 95th (m)	21.4	418.6											
Internal Link Dist (m)	1442	1414											
Turn Bay Length (m)	951	0											
Starvation Cap Reductn	0	0											
Spillback Cap Reductn	0	0											
Storage Cap Reductn	1.14	0.39											
Reduced v/c Ratio													
Intersection Summary													

HCM Signalized Intersection Capacity Analysis
14.: Kerr Street & Rail Track

Future Total AM (Phase 2)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	0	515	0	0	510	0
Future Volume (vph)	0	0	0	0	0	0	0	515	0	0	510	0
Ideal Flow (vphpb)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)								2.0				2.0
Lane Util. Factor								1.00				1.00
Flt Protected								1.00				1.00
Satd. Flow (prot)								1881				1845
Flt Permitted								1.00				1.00
Satd. Flow (perm)								1881				1845
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)	0	0	0	0	0	0	0	560	0	0	554	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	560	0	0	554	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	3%	0%
Turn Type								NA			NA	
Protected Phases		4						2			6	
Permitted Phases												
Actuated Green, G (s)								138.0			138.0	
Effective Green, g (s)								138.0			138.0	
Actuated g/C Ratio								0.77			0.77	
Clearance Time (s)								2.0			2.0	
Lane Grp Cap (vph)								1442			1414	
v/s Ratio Prot								0.30			cd.30	
v/c Ratio								0.39			0.39	
Uniform Delay, d1								7.0			7.0	
Progression Factor								1.00			1.00	
Incremental Delay, d2								0.8			0.8	
Delay (s)								7.8			7.8	
Level of Service								A			A	
Approach Delay (s)		0.0		0.0				7.8			7.8	
Approach LOS		A		A				A			A	
Intersection Summary												
HCM 2000 Control Delay								7.8			HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio								0.31				
Actuated Cycle Length (s)								180.0			Sum of lost time (s)	4.0
Intersection Capacity Utilization								30.4%			ICU Level of Service	A
Analysis Period (min)								15				
c. Critical Lane Group												

1: Kerr Street & Wycroft Road

Future Total PM (Phase 2)
Upper Kerr Village (8/7/24-01)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	25	140	125	615	520	110
Future Volume (Veh/h)	25	140	125	615	520	110
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	27	151	134	661	559	118
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)				None	None	None
Median type						
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	1222	344	682			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	1222	344	682			
IC, single (s)	6.8	7.0	4.2			
IC, 2 stage (s)						
p0 queue free %	3.5	3.3	2.3			
IF (s)	82	77	85			
CM capacity (veh/h)	148	644	876			
Direction_Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	27	151	134	330	330	373 304
Volume Left	27	0	134	0	0	0 0
Volume Right	0	151	0	0	0	0 118
cSH	148	644	876	1700	1700	1700 1700
Volume to Capacity	0.18	0.23	0.15	0.19	0.19	0.22 0.18
Queue Length 95th (m)	4.9	6.9	4.1	0.0	0.0	0.0 0.0
Control Delay (s)	34.8	12.3	9.8	0.0	0.0	0.0 0.0
Lane LOS	D	B	A			
Approach Delay (s)	15.7		1.7			0.0
Approach LOS	C					
Intersection Summary						
Average Delay	2.5					
Intersection Capacity Utilization	38.2%					
ICU Level of Service	A					
Analysis Period (min)	15					



2: Kerr Street & Shepherd Road

Future Total PM (Phase 2)
Upper Kerr Village (8/7/24-01)

Lane Group	WBL	WBT	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	105	0	545	110	155	470
Future Volume (vph)	105	0	545	110	155	470
Turn Type	Perm	NA	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases	8		2		2	6
Detector Phase	8		2		2	1
Switch Phase						
Minimum Initial (s)	5.0	5.0	18.0	18.0	7.0	18.0
Minimum Split (s)	22.0	22.0	28.2	28.2	11.0	28.2
Total Split (s)	33.0	33.0	53.0	53.0	22.0	75.0
Total Split (%)	30.6%	30.6%	49.1%	49.1%	20.4%	69.4%
Maximum Green (s)	29.0	29.0	47.8	47.8	18.0	69.8
Yellow Time (s)	3.0	3.0	3.3	3.3	4.0	3.3
All-Red Time (s)	1.0	1.0	1.9	1.9	0.0	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	5.2	5.2	4.0	5.2
Lead/Lag			Lag	Lag	Lead	Lead
Lead-Lag Optimize?			Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.5	3.5	2.5	3.5
Minimum Gap (s)	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
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	Min	Min	None	None
Walk Time (s)	7.0	7.0	10.0	10.0	10.0	7.0
Flash Dont Walk (s)	11.0	11.0	13.0	13.0	13.0	11.0
Pedestrian Calls (#/hr)	0	0	5	5	5	0
Intersection Summary						
Cycle Length	108					
Actuated Cycle Length	49.4					
Natural Cycle	65					
Control Type	Semi Ad-Uncoord					



Queues
2: Kerr Street & Shepherd Road

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group	108	149	562	113	160	485
Lane Group Flow (vph)	0.42	0.23	0.41	0.17	0.27	0.22
v/c Ratio	23.5	0.8	12.8	3.7	5.1	4.7
Control Delay	0.0	0.0	0.0	0.0	0.3	0.1
Queue Delay	23.5	0.8	12.8	3.7	5.4	4.8
Total Delay	8.0	0.0	17.3	0.0	4.2	7.7
Queue Length 50th (m)	21.6	0.0	33.5	7.6	11.5	16.1
Queue Length 95th (m)	241.3	143.2				21.4
Internal Link Dist (m)						
Turn Bay Length (m)				50.0		
Base Capacity (vph)	790	1084	3374	1467	847	3574
Starvation Cap Reductn	0	0	0	0	338	1608
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.14	0.17	0.08	0.31	0.25
Intersection Summary						

HCM Signalized Intersection Capacity Analysis
2: Kerr Street & Shepherd Road

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

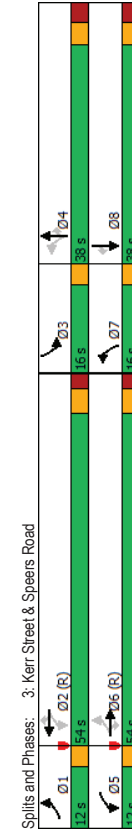
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Traffic Volume (vph)	0	0	0	105	0	145	0	545	110	155	470	0
Future Volume (vph)	0	0	0	105	0	145	0	545	110	155	470	0
Ideal Flow (vphpb)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0	4.0			5.2	5.2	4.0	5.2	
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95	
Fpb. ped/bikes				1.00	0.97			1.00	0.97	1.00	1.00	
Fpb. ped/bikes				0.98	1.00			1.00	1.00	1.00	1.00	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1716	1538			3539	1543	1804	3574	
Flt Permitted				0.76	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (perm)				1368	1538			3539	1543	665	3574	
Peak-Hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	0	0	108	0	149	0	562	113	160	485	0
RTOR Reduction (vph)	0	0	0	0	120	0	0	0	69	0	0	0
Lane Group Flow (vph)	0	0	0	108	29	0	0	562	44	160	485	0
Confl. Peds. (#/hr)	5	15	15	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	0%	0%	0%	3%	0%	1%	0%	2%	0%	1%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	3	0	0	5	0	0	0	0
Turn Type	Perm	Perm	NA	NA	NA	Perm	NA	NA	Perm	pm-pt	NA	Perm
Protected Phases		4		8			2			1		6
Permitted Phases	4			8	8	9.5	2	19.1	19.1	30.7	30.7	6
Actuated Green, G (s)				9.5	9.5	9.5	19.1	19.1	30.7	30.7	30.7	
Effective Green, g (s)				9.5	9.5	9.5	19.1	19.1	30.7	30.7	30.7	
Actuated G/C Ratio				0.19	0.19	0.19	0.39	0.39	0.62	0.62	0.62	
Clearance Time (s)				4.0	4.0	4.0	5.2	5.2	4.0	5.2	5.2	
Vehicle Extension (s)				3.0	3.0	3.0	3.5	3.5	2.5	3.5	3.5	
Lane Grp Cap (vph)				263	295		1368	596	588	2221		
v/s Ratio Prot				0.02			0.16		0.04	0.14		
v/s Ratio Perm				c0.08			0.03		0.13			
v/c Ratio				0.41	0.10	0.41	0.41	0.07	0.27	0.22		
Uniform Delay, d1				17.5	16.4		11.0	9.6	4.2	4.1		
Progression Factor				1.00	1.00		1.00	1.00	1.00	1.00		
Incremental Delay, d2				1.0	0.1		0.2	0.1	0.2	0.1		
Delay (s)				18.5	16.6		11.3	9.6	4.4	4.2		
Level of Service				B	B		B	A	A	A		
Approach Delay (s)				0.0			17.4		11.0		4.2	
Approach LOS				A			B		B		A	
Intersection Summary												
HCM 2000 Control Delay				9.3			HCM 2000 Level of Service				A	
HCM 2000 Volume to Capacity ratio				0.39								
Actuated Cycle Length (s)				49.4			Sum of lost time (s)				13.2	
Intersection Capacity Utilization				54.9%			ICU Level of Service				A	
Analysis Period (min)				15								
c. Critical Lane Group												

Timings
3: Kerr Street & Speers Road

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	95	610	140	300	965	445	155	160	235	260	250	100
Future Volume (vph)	95	610	140	300	965	445	155	160	235	260	250	100
Turn Type	pm-pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pt	NA	Perm
Protected Phases	1	6	6	2	2	2	4	4	4	4	3	8
Permitted Phases	1	6	6	2	2	2	7	7	7	4	4	8
Detector Phase												
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	16.0	38.0	38.0	16.0	38.0	38.0
Total Split (%)	10.0%	45.0%	45.0%	10.0%	45.0%	45.0%	13.3%	31.7%	31.7%	13.3%	31.7%	31.7%
Maximum Green (s)	9.0	48.1	48.1	9.0	48.1	48.1	13.0	31.7	31.7	13.0	31.7	31.7
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	Lead	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
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
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	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	14.0	14.0
Pedestrian Calls (#/hr)	15	15	15	15	15	15	35	35	35	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
3: Kerr Street & Speers Road

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	100	642	147	316	1016	468	163	168	247	274	263	105
v/c Ratio	0.33	0.41	0.19	0.65	0.58	0.48	0.53	0.48	0.53	0.77	0.73	0.28
Control Delay	12.5	23.6	9.7	21.6	25.0	3.9	33.9	47.2	10.2	66.9	57.1	8.8
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	12.5	23.6	9.7	21.6	25.0	3.9	33.9	47.2	10.2	66.9	57.1	8.8
Queue Length 50th (m)	11.8	53.1	8.8	34.1	87.8	0.0	27.4	35.6	2.5	32.6	58.9	0.0
Queue Length 95th (m)	26.0	94.4	20.0	#68.0	128.5	20.2	39.5	52.6	22.9	#47.8	80.6	13.4
Internal Link Dist (m)		138.4		474.4			103.4				143.2	
Turn Bay Length (m)	105.0		75.0	75.0		100.0	50.0		45.0	80.0		75.0
Base Capacity (vph)	323	1570	779	484	1737	967	323	495	564	375	501	473
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	0.31	0.41	0.19	0.65	0.58	0.48	0.50	0.34	0.44	0.73	0.52	0.22

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

3: Kerr Street & Speers Road

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	95	610	140	300	965	445	155	160	235	260	250	100
Future Volume (vph)	95	610	140	300	965	445	155	160	235	260	250	100
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
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00	0.97	1.00	1.00	0.93
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.99	1.00	1.00	1.00	0.95
Satd. Flow (prot)	1803	3511	1560	1750	3539	1485	1770	1877	1486	3467	1900	1501
Satd. Flow (perm)	388	3511	1560	587	3539	1485	622	1877	1486	3467	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)	100	642	147	316	1016	468	163	168	247	274	263	105
RTOR Reduction (vph)	0	0	81	0	0	238	0	0	191	0	0	85
Lane Group Flow (vph)	100	642	66	316	1016	230	163	168	56	274	263	20
Conf. Ped. (#/hr)	30	5	5	5	30	35	35	35	35	35	35	35
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	0%	0%	0%
Bus Blockages (#/hr)	0	4	0	0	0	0	0	3	0	0	0	0
Turn Type	pm-pt	NA	Perm	pm-pt	NA	Perm	pm-pt	NA	Perm	Prot	NA	Perm
Protected Phases	1	6	5	2	2	7	4			3	8	
Permitted Phases	6	6	2	2	2	4	4			4	8	
Actuated Green, G (s)	61.9	53.7	53.7	70.1	58.9	58.9	34.2	22.3	22.3	12.4	22.8	22.8
Effective Green, g (s)	61.9	53.7	53.7	70.1	58.9	58.9	34.2	22.3	22.3	12.4	22.8	22.8
Actuated G/C Ratio	0.52	0.45	0.45	0.58	0.49	0.49	0.29	0.19	0.19	0.10	0.19	0.19
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)	296	1571	698	472	1737	728	291	348	276	358	361	285
v/s Ratio Prot	0.02	0.18	0.04	c0.07	0.29	0.15	0.10	0.06	0.09	c0.08	c0.14	
v/s Ratio Perm	0.15	0.41	0.09	0.67	0.58	0.32	0.56	0.48	0.20	0.77	0.73	0.07
Uniform Delay, d1	16.0	22.4	19.1	13.8	21.8	18.4	34.3	43.7	41.3	52.4	45.7	39.9
Progression Factor	0.83	0.96	2.47	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.8	0.3	3.2	1.4	1.1	2.0	1.4	0.5	9.0	7.7	0.1
Delay (s)	13.7	22.3	47.5	17.0	23.3	19.5	36.3	45.1	41.8	61.4	53.3	40.0
Level of Service	B	C	D	B	C	B	D	D	D	E	D	D
Approach Delay (s)	25.5			21.2			41.2			54.6		D
Approach LOS	C			C			D			D		D
Intersection Summary												
HCM 2000 Control Delay	30.6 HCM 2000 Level of Service C											
HCM 2000 Volume to Capacity ratio	0.71											
Actuated Cycle Length (s)	120.0 Sum of lost time (s) 18.2											
Intersection Capacity Utilization	79.0% ICU Level of Service D											
Analysis Period (min)	15											
Critical Lane Group	c											

4: Dorval Road & Speers Road

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	
Traffic Volume (vph)	415	520	50	175	710	525	65	645	290	720	375	
Future Volume (vph)	415	520	50	175	710	525	65	645	290	720	375	
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm-pt	NA	pm+pt	NA	Perm	
Protected Phases	7	4	3	8	1	5	2	1	6			
Detector Phases	7	4	4	3	8	1	5	2	1	6	6	
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	7.0	20.0	20.0	
Minimum Split (s)	11.0	42.0	42.0	11.0	42.0	11.0	11.0	40.0	11.0	40.0	40.0	
Total Split (s)	19.0	44.0	44.0	17.0	42.0	19.0	11.0	40.0	19.0	48.0	48.0	
Total Split (%)	15.8%	36.7%	36.7%	14.2%	35.0%	15.8%	9.2%	33.3%	15.8%	40.0%	40.0%	
Maximum Green (s)	15.0	37.0	37.0	13.0	35.0	15.0	7.0	33.0	15.0	41.0	41.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	3.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	1.0	1.0	3.0	1.0	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	
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0	
Minimum Gap (s)	3.0	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	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	0.0	
Recall Mode	None	None	None	None	None	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	7.0	7.0	7.0	
Flash Dont Walk (s)	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	
Pedestrian Calls (#/hr)	5	5	5	5	5	5	5	5	5	5	5	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 17 (14%), Referenced to phase 2,NBTL and 6:SBTL, Start of Green												
Natural Cycle: 115												
Control Type: Actuated-Coordinated												
Splits and Phases:	4: Dorval Road & Speers Road											
	19 s	49 s	49 s	27 s	44 s	44 s	19 s	47 s	47 s	11 s	42 s	
	05	05	05	07	07	07	08	08	08	08	08	

Queues
4: Dorval Road & Speers Road

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	451	565	54	190	772	571	71	788	315	783	408
v/c Ratio	0.99	0.52	0.09	0.49	0.79	0.77	0.26	0.83	0.95	0.59	0.50
Control Delay	92.1	36.2	0.3	38.6	63.5	31.1	21.3	49.5	74.7	16.1	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	92.1	36.2	0.3	38.6	63.5	31.1	21.3	49.5	74.7	16.1	2.5
Queue Length 50th (m)	~59.7	57.5	0.0	33.9	89.1	52.8	9.2	90.1	~47.1	62.5	4.6
Queue Length 95th (m)	#91.8	74.6	0.0	63.0	120.2	115.0	17.7	113.5	#118.8	31.2	4.1
Internal Link Dist (m)	412.3			472.1			621.6			494.4	
Turn Bay Length (m)	60.0		60.0	85.0		55.0	70.0		110.0		
Base Capacity (vph)	456	1106	583	399	1034	738	277	974	330	1319	813
Stavation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.51	0.09	0.48	0.75	0.77	0.26	0.81	0.95	0.59	0.50
Intersection Summary											
~ Volume exceeds capacity, queue is theoretically infinite.											
Queue shown is maximum after two cycles.											
# 95th percentile volume exceeds capacity, queue may be longer.											
Queue shown is maximum after two cycles.											

HCM Signalized Intersection Capacity Analysis
4: Dorval Road & Speers Road

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	TT	TT	T	T	T	T	T	T	T	T	T
Traffic Volume (vph)	415	520	50	175	710	525	65	645	80	290	375
Future Volume (vph)	415	520	50	175	710	525	65	645	80	290	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3560	1556	1786	3546	1581	1805	3515	1787	3574	1599
Flt Permitted	0.95	1.00	1.00	0.37	1.00	1.00	0.31	1.00	0.13	1.00	1.00
Satd. Flow (perm)	3433	3560	1556	690	3546	1581	587	3515	235	3574	1599
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
Adj. Flow (vph)	451	565	54	190	772	571	71	701	87	315	408
RTOR Reduction (vph)	0	0	37	0	0	43	0	8	0	0	225
Lane Group Flow (vph)	451	565	17	190	772	528	71	780	0	315	183
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	2%	1%	2%	1%	1%	1%	0%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	2	0	0	4	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm-pt	NA	pm-pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2	1	6	
Permitted Phases			4			8		2			6
Actuated Green, G (s)	15.9	36.9	36.9	44.8	32.9	50.0	37.7	32.1	53.2	43.6	43.6
Effective Green, g (s)	15.9	36.9	36.9	44.8	32.9	50.0	37.7	32.1	53.2	43.6	43.6
Actuated g/C Ratio	0.13	0.31	0.31	0.37	0.27	0.42	0.31	0.27	0.44	0.36	0.36
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	454	1094	478	366	972	658	241	940	325	1298	580
v/s Ratio Prot	c0.13	c0.16		0.05	0.22	c0.11	0.01	0.22	c0.14	0.22	
v/s Ratio Perm			0.01	0.14	0.22	0.08		0.08	c0.29		0.11
v/c Ratio	0.99	0.52	0.03	0.52	0.79	0.80	0.29	0.83	0.97	0.60	0.31
Uniform Delay, d1	52.0	34.2	29.1	26.5	40.4	30.7	29.5	41.4	32.8	31.1	27.5
Progression Factor	1.00	1.00	1.00	1.75	1.41	1.04	1.00	1.00	1.46	0.46	0.15
Incremental Delay, d2	40.3	0.8	0.1	1.2	5.0	6.8	0.7	8.4	35.8	1.6	1.1
Delay (s)	92.3	35.0	29.1	47.6	62.2	38.6	30.1	49.8	83.8	15.9	5.3
Level of Service	F	D	C	D	E	D	C	D	F	B	A
Approach Delay (s)	58.9			51.6			48.2			27.2	
Approach LOS	E			D			D			C	
Intersection Summary											
HCM 2000 Control Delay	45.2			HCM 2000 Level of Service			D				
HCM 2000 Volume to Capacity ratio	0.93										
Actuated Cycle Length (s)	120.0										
Sum of lost time (s)	22.0										
Intersection Capacity Utilization	87.7%										
ICU Level of Service	E										
Analysis Period (min)	15										
Critical Lane Group	c										

Timings
5. St. Augustine Drive & Speers Road

Queues
5. St. Augustine Drive & Speers Road

Future Total PM (Phase 2)
Upper Kerr Village (8724-01)

Future Total PM (Phase 2)
Upper Kerr Village (8724-01)

Lane Group	EBL	EBT	WBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	75	790	1145	25	50	0
Future Volume (vph)	75	790	1145	25	50	0
Turn Type	Perm	NA	NA	Perm	NA	NA
Protected Phases	4		8		6	
Permitted Phases	4		8		6	
Detector Phase	4		8		6	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.9	23.9	24.3	24.3	24.3	24.3
Total Split (s)	93.0	93.0	93.0	27.0	27.0	27.0
Total Split (%)	77.5%	77.5%	77.5%	22.5%	22.5%	22.5%
Maximum Green (s)	87.1	87.1	87.1	20.7	20.7	20.7
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	2.2	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.9	5.9	6.3	6.3	6.3
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	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
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Min	C-Min	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0

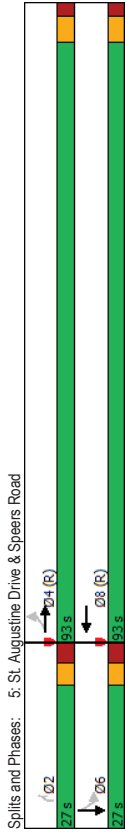
Lane Group	EBL	EBT	WBT	NBR	SBL	SBT
Lane Group Flow (vph)	78	849	1214	26	52	36
v/c Ratio	0.22	0.28	0.40	0.07	0.39	0.16
Control Delay	2.5	1.5	7.9	0.4	60.8	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.5	1.5	7.9	0.4	60.8	1.4
Queue Length 50th (m)	2.2	12.8	101.3	0.0	11.9	0.0
Queue Length 95th (m)	m3.2	m13.4	136.6	0.0	24.0	0.0
Internal Link Dist (m)		472.1	49.4			
Turn Bay Length (m)		50.0				93.6
Base Capacity (vph)	356	3032	3043	485	311	379
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 v/c Ratio	0.22	0.28	0.40	0.05	0.17	0.09

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Splits and Phases: 5. St. Augustine Drive & Speers Road

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 27 (23%), Referenced to phase 4:EBTL and 8:WBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

5. St. Augustine Drive & Speers Road

HCM Signalized Intersection Capacity Analysis

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	4	4	5	4	4	5	4	4	5	4	4
Traffic Volume (vph)	75	790	25	0	1145	20	0	0	25	50	0	35
Future Volume (vph)	75	790	25	0	1145	20	0	0	25	50	0	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9	5.9	5.9	5.9	5.9	6.3	6.3	6.3	6.3	6.3	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	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1800	3551	1800	3563	1800	3563	1644	1805	1615	1805	1615	1615
Flt Permitted	0.22	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	416	3551	416	3563	416	3563	1644	1805	1615	1805	1615	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	78	823	26	0	1193	21	0	0	26	52	0	36
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	24	0	34	0
Lane Group Flow (vph)	78	848	0	0	1213	0	0	0	2	52	2	0
Conf. Ped. (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	0%	1%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	NA	NA	NA	NA	Perm	Perm	Perm	Perm	NA	NA
Protected Phases		4			8							6
Permitted Phases		4			8							6
Actuated Green, G (s)	100.1	100.1	100.1	100.1	100.1	100.1	7.7	7.7	7.7	7.7	7.7	7.7
Effective Green, g (s)	100.1	100.1	100.1	100.1	100.1	100.1	7.7	7.7	7.7	7.7	7.7	7.7
Actuated G/C Ratio	0.83	0.83	0.83	0.83	0.83	0.83	0.06	0.06	0.06	0.06	0.06	0.06
Clearance Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	6.3	6.3	6.3	6.3	6.3	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	347	2962	347	2972	347	2972	105	115	103	115	103	103
v/s Ratio Prot	0.24				c0.34							0.00
v/s Ratio Perm	0.19						0.00	0.03				0.00
v/c Ratio	0.22	0.29	0.41		0.41		0.02	0.45		0.02		0.02
Uniform Delay, d1	2.0	2.2	2.5		2.5		52.6	54.1		52.6		52.6
Progression Factor	0.55	0.56	2.79		2.79		1.00	1.00		1.00		1.00
Incremental Delay, d2	2.2	1.4	1.1		0.4		52.7	56.9		52.7		52.7
Level of Service	A	A	A		A		D	D		D		D
Approach Delay (s)	1.5				7.3		52.7			55.2		55.2
Approach LOS	A	A	A		A		D	D		E		E
Intersection Summary												
HCM 2000 Control Delay	7.3 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.41											
Actuated Cycle Length (s)	120.0											
Intersection Capacity Utilization	55.7%											
Analysis Period (min)	15											
c Critical Lane Group	B											

6. Speers Road/Cornwall Road & Cross Avenue

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR	
Lane Configurations	5	2	2	5	2	2	5	2	2	5	4	
Traffic Volume (vph)	265	745	1325	10	420	10	420	10	420	10	420	
Future Volume (vph)	265	745	1325	10	420	10	420	10	420	10	420	
Turn Type	pm-pt	NA	NA	NA	NA	NA	Prot	Perm	Perm	Perm	Perm	
Protected Phases	5	2	2	6	4	4						
Permitted Phases	5	2	2	6	4	4						
Detector Phase	5	2	2	6	4	4						
Switch Phase												
Minimum Initial (s)	6.0	38.0	38.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	12.0	47.6	47.6	15.8	15.8	15.8	38.0	38.0	38.0	38.0	38.0	
Total Split (s)	17.0	102.0	85.0	38.0	38.0	38.0						
Total Split (%)	12.1%	72.9%	60.7%	27.1%	27.1%	27.1%						
Maximum Green (s)	11.0	95.4	78.4	32.2	32.2	32.2						
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3	3.3						
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5	2.5						
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0						
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8	5.8						
Lead/Lag	Lead	Lag	Lag									
Lead-Lag Optimize?	Yes	Yes	Yes									
Vehicle Extension (s)	3.5	5.0	5.0	3.0	3.0	3.0						
Minimum Gap (s)	3.0	3.0	3.0	0.0	0.0	0.0						
Time Before Reduce (s)	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						
Recall Mode	None	C-Min	C-Min	None	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: 6: Speers Road/Cornwall Road & Cross Avenue												

Queues
6: Speers Road/Cornwall Road & Cross Avenue

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

	EBL	EBT	WBT	SBL	SBR
Lane Group	276	776	1396	10	438
Lane Group Flow (vph)	0.64	0.27	0.67	0.05	0.80
v/c Ratio	27.8	3.8	22.4	54.1	31.0
Control Delay	0.0	0.0	0.0	0.0	0.0
Queue Delay	27.8	3.8	22.4	54.1	31.0
Total Delay	70.2	37.3	166.8	7.8	40.7
Queue Length 50th (m)	33.4	21.8	128.8	2.6	21.9
Queue Length 95th (m)	70.2	37.3	166.8	7.8	40.7
Internal Link Dist (m)	474.4	77.5	60.0		
Turn Bay Length (m)	80.0		45.0		
Base Capacity (vph)	432	2920	2073	415	856
Stavation 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	0.64	0.27	0.67	0.02	0.51
Intersection Summary					



HCM Signalized Intersection Capacity Analysis
6: Speers Road/Cornwall Road & Cross Avenue

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔
Traffic Volume (vph)	265	745	1325	15	420
Future Volume (vph)	265	745	1325	15	420
Ideal Flow (vphpb)	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
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00
Fibb. 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	0.10	1.00	1.00	0.95	1.00
Satd. Flow (perm)	188	3610	3567	1805	2733
Peak-Hour factor, PHF	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	276	776	1380	16	438
RTOR Reduction (vph)	0	0	0	0	266
Lane Group Flow (vph)	276	776	1396	0	172
Confl. Peds. (#/hr)	5	0	5	0	4
Heavy Vehicles (%)	6%	0%	1%	0%	4%
Turn Type	pm>pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2				4
Actuated Green, G (s)	113.2	113.2	81.4	14.4	14.4
Effective Green, g (s)	113.2	113.2	81.4	14.4	14.4
Actuated g/C Ratio	0.81	0.81	0.56	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)	431	2918	2073	185	281
v/s Ratio Prot	0.12	0.21	0.39	0.01	
v/s Ratio Perm	0.64	0.27	0.67	0.05	0.61
Uniform Delay, d1	27.1	3.3	20.2	56.7	60.1
Progression Factor	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.4	0.2	1.8	0.1	3.9
Delay (s)	30.5	3.5	21.9	56.8	64.1
Level of Service	C	A	C	E	E
Approach Delay (s)	10.6	21.9	63.9		
Approach LOS	B	C	E		
Intersection Summary					
HCM 2000 Control Delay	24.3		HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio	0.66				
Actuated Cycle Length (s)	140.0				
Intersection Capacity Utilization	75.5%		Sum of lost time (s)		18.4
Analysis Period (min)	15		ICU Level of Service		D
c Critical Lane Group					



7: Kerr Street & Prince Charles Drive

Future Total PM (Phase 2)

Upper Kerr Village (8/24-01)

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	525	10	20	655	25
Future Volume (Veh/h)	10	0	10	10	0	30	5	525	10	20	655	25
Sign Control	Stop	0%	Stop	0%	0%	Stop	0%	Free	0%	Free	0%	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	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	553	11	21	689	26
Pedestrians	20			30								5
Lane Width (m)	3.6			3.6								3.6
Walking Speed (m/s)	1.1			1.1								1.1
Percent Blockage	2			3								0
Right turn flare (veh)												
Median type								None				None
Median storage (veh)												
Upstream signal (m)								238				127
pX platoon unblocked	0.79	0.79	0.76	0.79	0.79	0.93	0.76					0.93
VC, conflicting volume	1370	1368	722	1354	1376	594	735					594
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	1146	1144	476	1125	1153	528	483					529
IC, single (s)	7.1	7.0	6.2	7.1	6.5	6.2	4.3					4.1
IC, 2 stage (s)												
p0 queue free %	3.5	4.5	3.3	3.5	4.0	3.3	2.4					2.2
IF (s)	91	100	98	92	100	94	99					98
CM capacity (veh/h)	122	120	442	131	146	500	734					929
Direction_Lane #	EB 1	WB 1	NB 1	SB 1	EB 1	NB 1	SB 1					
Volume Total	22	43	569	736								
Volume Left	11	11	5	21								
Volume Right	11	32	11	26								
cSH	191	290	734	929								
Volume to Capacity	0.11	0.15	0.01	0.02								
Queue Length 95th (m)	2.9	3.9	0.2	0.5								
Control Delay (s)	26.2	19.5	0.2	0.6								
Lane LOS	D	C	A	A								
Approach Delay (s)	26.2	19.5	0.2	0.6								
Approach LOS	D	C	A	A								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			60.4%									B
Analysis Period (min)			15									

8: Kerr Street & Elmwood Road

Future Total PM (Phase 2)

Upper Kerr Village (8/24-01)

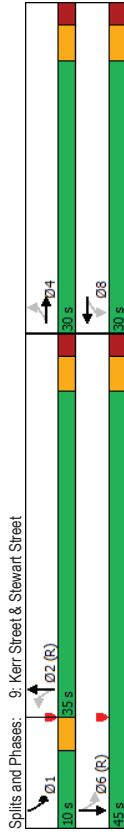
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	10	5	520	615	40
Future Volume (Veh/h)	15	10	5	520	615	40
Sign Control	Stop	0%	Free	0%	Free	0%
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	11	5	547	647	42
Pedestrians	36					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	3					
Right turn flare (veh)						
Median type				None	None	None
Median storage (veh)						
Upstream signal (m)				103	262	
pX platoon unblocked	0.85	0.80	0.80			
VC, conflicting volume	1260	703	724			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	964	504	530			
IC, single (s)	6.4	6.3	4.3			
IC, 2 stage (s)						
p0 queue free %	83	97	99			
IF (s)	237	428	737			
CM capacity (veh/h)						
Direction_Lane #	EB 1	NB 1	SB 1			
Volume Total	27	552	689			
Volume Left	16	5	0			
Volume Right	11	0	42			
cSH	289	737	1700			
Volume to Capacity	0.09	0.01	0.41			
Queue Length 95th (m)	2.3	0.2	0.0			
Control Delay (s)	18.7	0.2	0.0			
Lane LOS	C	A	A			
Approach Delay (s)	18.7	0.2	0.0			
Approach LOS	C	A	A			
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			45.0%			
Analysis Period (min)			15			
ICU Level of Service						A

Timings
9: Kerr Street & Stewart Street

Future Total PM (Phase 2)
Upper Kerr Village (8724-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	4	4	8	8	2	2	1	6
Traffic Volume (vph)	50	10	10	15	10	400	55	505
Future Volume (vph)	50	10	10	15	10	400	55	505
Turn Type	Perm	NA	Perm	NA	Perm	NA	prn+pt	NA
Protected Phases	4		8		2		1	6
Permitted Phases	4	4	8	8	2	2	1	6
Detector Phase								
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	0.0	0.0
Total Lost Time (s)	5.4	5.4	5.4	5.4	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:NBT and 6:SBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated



Queues
 9: Kerr Street & Stewart Street

Future Total PM (Phase 2)
 Upper Kerr Village (8724-01)

	EBT	WBT	NBT	SBT
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	81	109	462	663
v/c Ratio	0.29	0.29	0.36	0.56
Control Delay	21.6	10.0	8.0	11.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.6	10.0	8.0	11.0
Queue Length 50th (m)	8.5	3.4	19.2	33.6
Queue Length 95th (m)	16.5	13.0	56.9	102.4
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)				
Base Capacity (vph)	444	552	1297	1192
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	0.18	0.20	0.36	0.56

Intersection Summary

9: Kerr Street & Stewart Street

Future Total PM (Phase 2)

Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	50	10	15	10	15	75	10	400	15	55	505	50
Traffic Volume (vph)	50	10	15	10	15	75	10	400	15	55	505	50
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	0.99	0.96	0.96	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.97	0.90	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	1661	1562	1562	1856	1856	1856	1856	1856	1856	1856	1856	1856
Satd. Flow (prot)	0.77	0.97	0.97	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Flt Permitted	1323	1518	1518	1830	1830	1830	1830	1830	1830	1830	1830	1830
Satd. Flow (perm)	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Peak-hour factor, PHF	54	11	16	11	16	82	11	435	16	60	549	54
Adj. Flow (vph)	0	13	0	0	68	0	0	1	0	0	3	0
RTOR Reduction (vph)	0	68	0	0	41	0	0	461	0	0	660	0
Lane Group Flow (vph)	20	15	15	20	35	20	35	25	25	25	35	35
Confl. Peds. (#/hr)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Heavy Vehicles (%)	0	2	0	0	2	0	0	0	0	0	3	0
Bus Blockages (#/hr)	Perm	NA	NA	Perm	NA	Perm	NA	NA	pm-pt	NA	NA	NA
Turn Type	4	4	8	8	2	2	2	2	1	6	6	6
Protected Phases	13.2	13.2	13.2	13.2	51.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0
Actuated Green, G (s)	0.18	0.18	0.18	0.18	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Effective Green, g (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Actuated G/C Ratio	232	267	267	267	1244	1244	1244	1244	1244	1244	1244	1244
Clearance Time (s)	c0.05	0.03	0.03	0.03	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Vehicle Extension (s)	0.29	0.16	0.16	0.16	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
Lane Grp Cap. (vph)	26.8	26.2	26.2	26.2	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
v/s Ratio Prot	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
v/s Ratio Perm	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay, d1	27.8	26.5	26.5	26.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Progression Factor	C	C	C	C	A	A	A	A	A	A	A	A
Incremental Delay, d2	27.8	26.5	26.5	26.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Delay (s)	C	C	C	C	A	A	A	A	A	A	A	A
Level of Service	C	C	C	C	A	A	A	A	A	A	A	A
Approach Delay (s)	C	C	C	C	A	A	A	A	A	A	A	A
Approach LOS	C	C	C	C	A	A	A	A	A	A	A	A
Intersection Summary	<p>HCM 2000 Control Delay: 9.6 HCM 2000 Level of Service: A</p> <p>HCM 2000 Volume to Capacity ratio: 0.54</p> <p>Actuated Cycle Length (s): 75.0 Sum of lost time (s): 13.8</p> <p>Intersection Capacity Utilization: 81.3% ICU Level of Service: D</p> <p>Analysis Period (min): 15</p>											
c Critical Lane Group												

10: Donval Road & Wyecroft Road

Future Total PM (Phase 2)

Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	385	220	60	95	490	95	1345	130	1180	1180	1180	1180
Traffic Volume (vph)	385	220	60	95	490	95	1345	130	1180	1180	1180	1180
Future Volume (vph)	Prot	NA	pm-pt	NA	pm+ov	pm-pt	NA	Prot	NA	Prot	NA	6
Turn Type	7	4	3	8	8	2	2	1	5	2	1	6
Protected Phases	7	4	3	8	8	1	5	2	1	5	2	1
Detector Phase	7	4	3	8	8	1	5	2	1	5	2	1
Switch Phase	7.0	10.0	7.0	10.0	7.0	7.0	20.0	7.0	20.0	7.0	20.0	20.0
Minimum Initial (s)	12.0	25.0	12.0	25.0	12.0	12.0	41.0	12.0	41.0	12.0	41.0	41.0
Minimum Split (s)	21.0	40.0	21.0	40.0	17.0	17.0	42.0	17.0	42.0	17.0	42.0	42.0
Total Split (s)	17.5%	33.3%	17.5%	33.3%	14.2%	14.2%	35.0%	14.2%	35.0%	14.2%	35.0%	35.0%
Total Split (%)	16.0	33.0	16.0	33.0	12.0	12.0	35.0	12.0	35.0	12.0	35.0	35.0
Maximum Green (s)	3.0	4.0	3.0	4.0	3.0	3.0	4.0	3.0	4.0	3.0	4.0	4.0
Yellow Time (s)	2.0	3.0	2.0	3.0	2.0	2.0	3.0	2.0	3.0	2.0	3.0	3.0
All-Red Time (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
Lost Time Adjust (s)	5.0	7.0	5.0	7.0	5.0	5.0	7.0	5.0	7.0	5.0	7.0	7.0
Total Lost Time (s)	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead/Lag	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead-Lag Optimize?	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (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
Time Before Reduce (s)	None	None	None	None	None	None	None	None	None	None	None	None
Time To Reduce (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Recall Mode	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Walk Time (s)	0	0	0	0	0	0	0	0	0	0	0	0
Flash Dont Walk (s)	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Intersection Summary	<p>Cycle Length: 120</p> <p>Actuated Cycle Length: 102 (86%), Referenced to phase 2:NETL and 6:SBT, Start of Green</p> <p>Natural Cycle: 90</p> <p>Control Type: Actuated-Coordinated</p>											
Splits and Phases:	<p>10: Donval Road & Wyecroft Road</p> <p>Ø1 17.5 s Ø2 (R) 42.3 s Ø3 21.3 s Ø4 40.5 s</p> <p>Ø5 17.5 s Ø6 (R) 42.3 s Ø7 21.3 s Ø8 40.5 s</p>											

Queues
10: Dorval Road & Wynecroft Road

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	418	418	65	103	533	103	1505	141
Lane Group Flow (vph)	0.98	0.56	0.22	0.48	0.88	0.43	0.89	0.19
v/c Ratio	90.1	30.6	30.2	55.8	45.0	14.8	39.9	28.0
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	90.1	30.6	30.2	55.8	45.0	14.8	39.9	28.0
Total Delay	51.2	30.0	10.9	23.0	91.0	7.9	136.7	13.8
Queue Length 50th (m)	#82.7	45.1	19.8	38.3	129.7	m11.2	m162.4	23.2
Queue Length 95th (m)	155.6			199.3		494.4		672.1
Internal Link Dist (m)	115.0		145.0		65.0		125.0	
Turn Bay Length (m)	428	1004	371	474	607	261	1690	730
Base Capacity (vph)	0	0	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.42	0.18	0.22	0.88	0.39	0.89	0.19

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
10: Dorval Road & Wynecroft Road

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	TT	TT	TT	T	T	T	T	T	T	T	T	T
Traffic Volume (vph)	385	220	165	60	95	490	95	1345	40	130	1180	210
Future Volume (vph)	385	220	165	60	95	490	95	1345	40	130	1180	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	5.0	5.0	7.0	5.0	5.0	7.0	5.0	7.0	5.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.97	0.91	0.97	0.91
Fpb. ped/bikes	1.00	0.99	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94	1.00	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	0.98
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	3213	3234	1783	1727	1590	1736	5041	3502	4973	3502	4973	1000
Flt Permitted	0.95	1.00	0.51	1.00	1.00	0.13	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (perm)	3213	3234	953	1727	1590	229	5041	3502	4973	3502	4973	1000
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)	418	239	179	65	103	533	103	1462	43	141	1283	228
RTOR Reduction (vph)	0	128	0	0	0	54	0	3	0	0	17	0
Lane Group Flow (vph)	418	290	0	65	103	479	103	1502	0	141	1494	0
Confl. Peds. (#/hr)	1	4	4	4	4	1	1	1	1	1	1	1
Heavy Vehicles (%)	9%	4%	2%	1%	10%	1%	4%	2%	2%	0%	1%	5%
Bus Blockages (#/hr)	0	2	0	0	0	0	0	3	0	0	0	0
Turn Type	Prot	NA	NA	pm-pt	NA	pm-ov	pm-pt	NA	Prot	NA	Prot	NA
Protected Phases	7	4		3	8	1	5	2		1		6
Permitted Phases				8		8		2				
Actuated Green, G (s)	16.0	22.8	24.8	15.8	40.8	50.1	39.2	25.0	39.2	25.0	53.3	53.3
Effective Green, g (s)	16.0	22.8	24.8	15.8	40.8	50.1	39.2	25.0	39.2	25.0	53.3	53.3
Actuated G/C Ratio	0.13	0.19	0.21	0.13	0.34	0.42	0.33	0.21	0.44	0.21	0.44	0.44
Clearance Time (s)	5.0	7.0	5.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	428	614	259	227	540	232	1646	729	2208	729	2208	2208
v/s Ratio Prot	c0.13	0.09	0.02	0.06	c0.18	0.04	c0.30	0.04	0.30	0.04	0.30	0.30
v/s Ratio Perm			0.03		0.12	0.14						
v/c Ratio	0.98	0.47	0.25	0.45	0.89	0.44	0.91	0.19	0.68	0.19	0.68	0.68
Uniform Delay, d1	51.8	43.2	39.2	48.1	37.4	22.1	38.8	39.2	26.5	39.2	26.5	26.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	0.78	0.91	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	37.4	1.2	1.1	3.0	17.1	1.4	5.1	0.3	1.7	0.3	1.7	1.7
Delay (s)	89.2	44.4	40.3	51.1	54.5	18.7	40.6	39.5	28.2	39.5	28.2	28.2
Level of Service	F	D	D	D	D	B	D	D	C	D	C	C
Approach Delay (s)		66.8			52.7		39.2		29.2		29.2	
Approach LOS		E			D		D		C		C	

Intersection Summary
HCM 2000 Control Delay
HCM 2000 Volume to Capacity ratio
Actuated Cycle Length (s)
Intersection Capacity Utilization
Analysis Period (min)
c Critical Lane Group

11: Speers Road & Interim Connection

Future Total PM (Phase 2)
Upper Kerr Village (8/7/24-01)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	0	865	1135	80	0	30
Future Volume (Veh/h)	0	865	1135	80	0	30
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	940	1234	87	0	33
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLT	TL	TWLT	TL		
Median storage (veh)	2	2				
Upstream signal (m)	73	162				
pX platoon unblocked	0.79		0.82	0.79		
vC, conflicting volume	1321		1748	660		
vC1, stage 1 conf vol			1278			
vC2, stage 2 conf vol			470			
vCu, unblocked vol	879		1190	45		
IC, single (s)	4.1		6.8	6.9		
IC, 2 stage (s)	2.2		5.8			
p0 queue free %	100		100	96		
p0 capacity (veh/h)	615		295	809		
Direction_Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1 SB 2
Volume Total	0	470	470	823	498	0 33
Volume Left	0	0	0	0	0	0 0
Volume Right	0	0	0	0	87	0 33
cSH	1700	1700	1700	1700	1700	809
Volume to Capacity	0.00	0.28	0.28	0.48	0.29	0.11 0.04
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0 1.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0 9.6
Lane LOS						A A
Approach Delay (s)	0.0			0.0		9.6
Approach LOS						A
Intersection Summary						
Average Delay	0.1					
Intersection Capacity Utilization	43.9%					
ICU Level of Service	A					
Analysis Period (min)	15					

14: Kerr Street & Rail Track

Future Total PM (Phase 2)
Upper Kerr Village (8/7/24-01)

Lane Group	NBT	SBT	Ø4
Lane Configurations	↔	↔	↔
Traffic Volume (vph)	690	625	
Future Volume (vph)	690	625	
Turn Type	NA	NA	
Protected Phases	2	6	4
Permitted Phases	2	6	
Detector Phase			
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	22.0	22.0	22.0
Total Split (s)	140.0	140.0	40.0
Total Split (%)	77.8%	77.8%	22%
Maximum Green (s)	138.0	138.0	38.0
Yellow Time (s)	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	
Total Lost Time (s)	2.0	2.0	
Lead/Lag			
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0
Recall Mode	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0
Intersection Summary			
Cycle Length: 180			
Actuated Cycle Length: 180			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 50			
Control Type: Prelimed			
Splits and Phases: 14: Kerr Street & Rail Track			
Ø2 (R)	↔	↔	↔
Ø4	↔	↔	↔
Ø6 (R)	↔	↔	↔
Ø4	↔	↔	↔
Ø6 (R)	↔	↔	↔
Ø4	↔	↔	↔
Ø6 (R)	↔	↔	↔

Queues
14.: Kerr Street & Rail Track

HCM Signalized Intersection Capacity Analysis
14.: Kerr Street & Rail Track

Future Total PM (Phase 2)
Upper Kerr Village (8724-01)

Future Total PM (Phase 2)
Upper Kerr Village (8724-01)

	NBT	SBT	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	719	651											
Lane Group Flow (vph)	0.50	0.45											
v/c Ratio	9.3	8.7											
Control Delay	52.8	0.0											
Queue Delay	62.1	8.7											
Total Delay	88.4	75.8											
Queue Length 50th (m)	111.6	95.9											
Queue Length 95th (m)	21.4	418.6											
Internal Link Dist (m)	1442	1442											
Turn Bay Length (m)	828	0											
Starvation Cap Reductn	0	0											
Spillback Cap Reductn	0	0											
Storage Cap Reductn	1.17	0.45											
Reduced v/c Ratio													
Intersection Summary													

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	0	690	0	0	625	0
Future Volume (vph)	0	0	0	0	0	0	0	690	0	0	625	0
Ideal Flow (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)								2.0				2.0
Lane Util. Factor								1.00				1.00
Ft								1.00				1.00
Flt Protected								1.00				1.00
Satd. Flow (prot)								1881				1881
Flt Permitted								1.00				1.00
Satd. Flow (perm)								1881				1881
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	0	0	0	0	719	0	0	651	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	719	0	0	651	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Turn Type								NA				NA
Protected Phases		4						2				6
Permitted Phases												
Actuated Green, G (s)								138.0				138.0
Effective Green, g (s)								138.0				138.0
Actuated g/C Ratio								0.77				0.77
Clearance Time (s)								2.0				2.0
Lane Grp Cap (vph)								1442				1442
v/s Ratio Prot								d.38				0.35
v/c Ratio								0.50				0.45
Uniform Delay, d1								7.9				7.5
Progression Factor								1.00				1.00
Incremental Delay, d2								1.2				1.0
Delay (s)								9.2				8.5
Level of Service								A				A
Approach Delay (s)		0.0		0.0				9.2				8.5
Approach LOS		A		A				A				A
Intersection Summary												
HCM 2000 Control Delay								8.9				A
HCM 2000 Volume to Capacity ratio								0.39				A
Actuated Cycle Length (s)								180.0				4.0
Intersection Capacity Utilization								39.6%				A
Analysis Period (min)								15				
c. Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
 1: Kerr Street & Wycroft Road

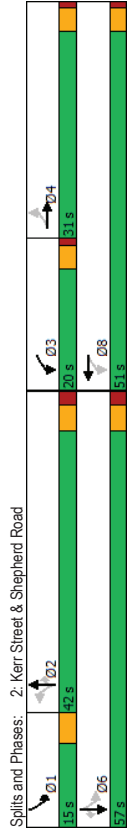
Future Total AM (Phase 2)
 Upper Kerr Village (8/24-01)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	5	90	200	325	475	125
Traffic Volume (veh/h)	5	90	200	325	475	125
Future Volume (Veh/h)	5	90	200	325	475	125
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	5	96	213	346	505	133
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)				None	None	None
Median type						
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	1170	319	638			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	1170	319	638			
IC, single (s)	6.8	7.0	4.1			
IC, 2 stage (s)	3.5	3.3	2.2			
p0 queue free %	97	86	77			
CM capacity (veh/h)	146	674	942			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	5	96	213	173	173	337 301
Volume Left	5	0	213	0	0	0 0
Volume Right	0	96	0	0	0	0 133
cSH	146	674	942	1700	1700	1700 1700
Volume to Capacity	0.03	0.14	0.23	0.10	0.10	0.20 0.18
Queue Length 95th (m)	0.8	3.8	6.6	0.0	0.0	0.0 0.0
Control Delay (s)	30.5	11.2	9.9	0.0	0.0	0.0 0.0
Lane LOS	D	B	A			
Approach Delay (s)	12.2		3.8			0.0
Approach LOS	B					
Intersection Summary						
Average Delay	2.6					
Intersection Capacity Utilization	41.5%					
ICU Level of Service	A					
Analysis Period (min)	15					

Timings
 2: Kerr Street & Shepherd Road

Future Total AM (Phase 2)
 Upper Kerr Village (8/24-01)

Lane Group	WBL	WBT	NBT	NBR	SBL	SBT	Ø4
Lane Configurations	←	←	←	←	←	←	←
Traffic Volume (vph)	120	0	300	70	90	420	
Future Volume (vph)	120	0	300	70	90	420	
Turn Type	pm+pt	NA	NA	Perm	pm+pt	NA	
Protected Phases	3	8	2		1	6	4
Permitted Phases	8			2	6		
Detector Phase	3	8	2	2	1	6	
Switch Phase							
Minimum Initial (s)	5.0	5.0	18.0	18.0	7.0	18.0	5.0
Minimum Split (s)	9.0	22.0	28.2	28.2	11.0	28.2	22.0
Total Split (s)	20.0	51.0	42.0	42.0	15.0	57.0	31.0
Total Split (%)	18.5%	47.2%	38.9%	38.9%	13.9%	52.8%	29%
Maximum Green (s)	16.0	47.0	36.8	36.8	11.0	51.8	27.0
Yellow Time (s)	3.0	3.0	3.3	3.3	4.0	3.3	3.0
All-Red Time (s)	1.0	1.0	1.9	1.9	0.0	1.9	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	5.2	5.2	4.0	5.2	4.0
Lead/Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.5	3.5	2.5	3.5	3.0
Minimum Gap (s)	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
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	Min	Min	None	Min	None
Walk Time (s)	7.0	10.0	10.0	10.0	10.0	7.0	
Flash Dont Walk (s)	11.0	13.0	13.0	13.0	13.0	11.0	
Pedestrian Calls (#/hr)	0	5	5	5	5	0	
Intersection Summary							
Cycle Length	108						
Actuated Cycle Length	45.7						
Natural Cycle	75						
Control Type	Semi Act-Uncooord						



Queues
2: Kerr Street & Shepherd Road

Future Total AM (Phase 2)
Upper Kerr Village (8/24-01)

	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group						
Lane Group Flow (vph)	132	236	330	77	99	462
v/c Ratio	0.41	0.35	0.22	0.11	0.14	0.22
Control Delay	22.0	1.4	10.2	2.9	4.0	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.7	0.1
Total Delay	22.0	1.4	10.2	2.9	4.7	4.6
Queue Length 50th (m)	9.7	0.0	9.3	0.0	2.4	7.0
Queue Length 95th (m)	23.9	0.0	17.5	4.9	6.9	14.0
Internal Link Dist (m)	241.3					
Turn Bay Length (m)	50.0					
Base Capacity (vph)	602	1510	2811	1215	771	3462
Starvation Cap Reductn	0	0	0	0	462	1587
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.16	0.12	0.06	0.32	0.25
Intersection Summary						

HCM Signalized Intersection Capacity Analysis
2: Kerr Street & Shepherd Road

Future Total AM (Phase 2)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Traffic Volume (vph)	0	0	0	120	0	215	0	300	70	90	420	0
Future Volume (vph)	0	0	0	120	0	215	0	300	70	90	420	0
Ideal Flow (vphpb)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0			5.2			5.2		
Lane Util. Factor	1.00			1.00			0.95			1.00		
Fpb. ped/bikes	1.00			0.97			1.00			0.97		
Fpb. ped/bikes	1.00			1.00			1.00			1.00		
Frt	1.00			0.85			1.00			0.85		
Flt Protected	0.95			1.00			1.00			0.95		
Satd. Flow (prot)	1664			1559			3497			1785		
Flt Permitted	0.73			1.00			1.00			0.46		
Satd. Flow (perm)	1274			1559			3497			1499		
Peak-Hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	132	0	236	0	330	77	99	462	0
RTOR Reduction (vph)	0	0	0	177	0	0	0	0	47	0	0	0
Lane Group Flow (vph)	0	0	0	132	59	0	0	330	30	99	462	0
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	0%	0%	0%	8%	0%	0%	0%	2%	5%	1%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	2	0	6	0	0	0	0
Turn Type	Perm	Perm	pm-pt	NA	NA	Perm	NA	NA	Perm	pm-pt	NA	Perm
Protected Phases	4			3			8			2		
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	12.6			12.6			12.6			19.4		
Effective Green, g (s)	12.6			12.6			12.6			19.4		
Actuated G/C Ratio	0.25			0.25			0.38			0.57		
Clearance Time (s)	4.0			4.0			4.0			5.2		
Vehicle Extension (s)	3.0			3.0			3.5			2.5		
Lane Grp Cap (vph)	372			388			1343			575		
v/s Ratio Prot	c0.05			0.04			0.09			0.02		
v/s Ratio Perm	c0.04									0.08		
v/c Ratio	0.35			0.15			0.25			0.05		
Uniform Delay, d1	15.5			14.8			10.6			9.8		
Progression Factor	1.00			1.00			1.00			1.00		
Incremental Delay, d2	0.6			0.2			0.1			0.1		
Delay (s)	16.1			15.0			10.7			9.8		
Level of Service	B			B			B			A		
Approach Delay (s)	0.0			15.4			10.5			5.4		
Approach LOS	A			B			B			A		
Intersection Summary												
HCM 2000 Control Delay	9.7			HCM 2000 Level of Service			A			A		
HCM 2000 Volume to Capacity ratio	0.33											
Actuated Cycle Length (s)	50.5			Sum of lost time (s)			17.2			B		
Intersection Capacity Utilization	56.0%			ICU Level of Service			B			B		
Analysis Period (min)	15											
c. Critical Lane Group												

Timings
3: Kerr Street & Speers Road

Queues
3: Kerr Street & Speers Road

Future Total AM (Phase 2)
 Upper Kerr Village (8/24-01)

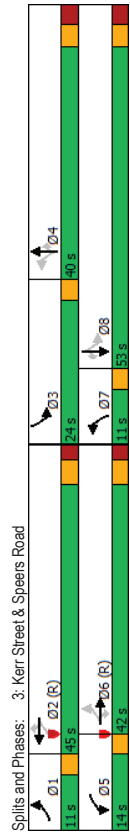
Future Total AM (Phase 2)
 Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	90	770	100	195	570	165	105	115	370	325	150	105
Traffic Volume (vph)	110	420	420	140	450	450	110	400	400	240	530	530
Future Volume (vph)	90	770	100	195	570	165	105	115	370	325	150	105
Turn Type	pm-pt	NA	Perm	pm-pt	NA	Perm	pm-pt	NA	Perm	pm-pt	NA	Perm
Protected Phases	1	6	6	2	2	2	4	4	4	4	3	8
Permitted Phases	1	6	6	2	2	2	4	4	4	4	3	8
Detector Phase												
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
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
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	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	14.0	14.0
Pedestrian Calls (#/hr)	15	15	15	15	15	15	15	35	35	35	35	35

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	105	895	116	227	663	192	122	134	430	378	174	122
v/c Ratio	0.28	0.78	0.21	0.72	0.48	0.27	0.33	0.35	0.90	0.69	0.30	0.22
Control Delay	17.7	37.8	5.7	35.2	29.8	5.1	22.7	41.2	42.5	31.1	31.0	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.0	0.0
Total Delay	17.7	37.8	5.7	35.2	29.8	5.1	22.7	41.2	42.5	33.8	31.0	5.2
Queue Length 50th (m)	9.5	111.0	1.5	29.8	62.3	0.0	16.7	26.7	47.8	61.6	30.2	0.0
Queue Length 95th (m)	19.4	130.2	7.9	74.1	82.5	13.6	24.1	39.1	75.8	73.7	41.5	10.3
Internal Link Dist (m)		145.3		474.4			103.4				143.2	
Turn Bay Length (m)	105.0		75.0	75.0	100.0	50.0	50.0	376	517	568	549	718
Base Capacity (vph)	377	1144	562	316	1390	718	376	517	568	549	718	662
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	0.28	0.78	0.21	0.72	0.48	0.27	0.32	0.26	0.76	0.81	0.24	0.18

Intersection Summary
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

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



3: Kerr Street & Speers Road

Future Total AM (Phase 2)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	90	770	100	195	570	165	105	115	370	325	150	105
Traffic Volume (vph)	90	770	100	195	570	165	105	115	370	325	150	105
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpt)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Total Lost time (s)	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.95
Fpb. per/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00	0.98	1.00	1.00
Fpb. per/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00	0.98	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95
Satd. Flow (prot)	1799	3378	1437	1687	3438	1495	1674	1844	1429	1677	1845	1511
Flt Permitted	0.37	1.00	1.00	0.13	1.00	1.00	0.65	1.00	0.65	1.00	0.57	1.00
Satd. Flow (perm)	694	3378	1437	238	3438	1495	1141	1844	1429	999	1845	1511
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	105	895	116	227	663	192	122	134	430	378	174	122
RTOR Reduction (vph)	0	0	76	0	0	114	0	0	185	0	0	84
Lane Group Flow (vph)	105	895	40	227	663	78	122	134	245	378	174	38
Confl. Peds. (#/hr)	15	10	10	15	20	15	20	35	35	20	20	20
Heavy Vehicles (%)	0%	6%	7%	7%	5%	4%	6%	1%	5%	5%	3%	2%
Bus Blockages (#/hr)	0	4	0	0	0	0	0	5	0	0	0	0
Turn Type	pm-pt	NA	Perm	pm-pt	NA	Perm	pm-pt	NA	Perm	pm-pt	NA	Perm
Permitted Phases	1	6	5	2	2	7	4	4	3	8	8	8
Protected Phases	6	6	2	2	4	4	4	4	4	8	8	8
Actuated Green, G (s)	48.7	40.6	40.6	59.6	48.5	48.5	32.5	24.7	24.7	48.2	37.4	37.4
Effective Green, g (s)	48.7	40.6	40.6	59.6	48.5	48.5	32.5	24.7	24.7	48.2	37.4	37.4
Actuated G/C Ratio	0.41	0.34	0.50	0.40	0.40	0.27	0.21	0.21	0.21	0.40	0.31	0.31
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	2.5	2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap. (vph)	356	1142	486	311	1389	604	343	379	294	517	575	470
v/s Ratio Prot	0.02	c0.26	0.03	c0.10	0.19	0.02	0.07	0.02	0.07	c0.12	0.09	0.03
v/s Ratio Perm	0.10	0.03	0.27	0.05	0.07	0.05	0.07	c0.17	0.17	0.17	0.03	0.03
v/s Ratio	0.29	0.78	0.08	0.73	0.48	0.13	0.36	0.35	0.83	0.73	0.30	0.08
Uniform Delay, d1	22.6	35.7	27.0	22.0	26.4	22.5	34.4	40.8	45.7	27.9	31.4	29.2
Progression Factor	0.89	0.87	0.84	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	5.2	0.3	7.8	1.2	0.4	0.5	0.8	18.7	5.0	0.4	0.1
Delay (s)	20.4	36.2	23.0	29.8	27.6	22.9	34.9	41.6	64.3	32.9	31.8	29.3
Level of Service	C	D	C	C	C	C	C	D	E	C	C	C
Approach Delay (s)	33.4	C	C	C	27.2	C	54.7	D	C	32.0	C	C
Approach LOS	C	C	C	C	C	C	D	D	C	C	C	C
Intersection Summary												
HCM 2000 Control Delay	35.3 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.78											
Actuated Cycle Length (s)	120.0 Sum of lost time (s)											
Intersection Capacity Utilization	81.6% ICU Level of Service											
Analysis Period (min)	15											
Critical Lane Group	c											

4: Donval Road & Speers Road

Future Total AM (Phase 2)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	
Lane Configurations	415	605	40	80	410	315	70	860	280	545	255	
Traffic Volume (vph)	415	605	40	80	410	315	70	860	280	545	255	
Future Volume (vph)	415	605	40	80	410	315	70	860	280	545	255	
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm+pt	NA	pm+pt	NA	Perm	
Protected Phases	7	4	4	3	8	1	5	2	1	6	6	
Permitted Phases	7	4	4	3	8	1	5	2	1	6	6	
Detector Phase	7	4	4	3	8	1	5	2	1	6	6	
Switch Phase	7	4	4	3	8	1	5	2	1	6	6	
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	7.0	20.0	20.0	
Minimum Split (s)	11.0	42.0	42.0	11.0	42.0	11.0	11.0	40.0	11.0	40.0	40.0	
Total Split (s)	21.0	50.0	50.0	13.0	42.0	12.0	11.0	45.0	12.0	46.0	46.0	
Total Split (%)	17.5%	41.7%	41.7%	10.8%	35.0%	10.0%	9.2%	37.5%	10.0%	38.3%	38.3%	
Maximum Green (s)	17.0	43.0	43.0	9.0	35.0	8.0	7.0	38.0	8.0	39.0	39.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	3.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	1.0	1.0	3.0	1.0	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	
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0	
Minimum Gap (s)	3.0	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	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	0.0	
Recall Mode	None	None	None	None	None	None	None	C-Min	None	C-Min	C-Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	
Pedestrian Calls (#/hr)	5	5	5	5	5	5	5	5	5	5	5	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 41 (34%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green												
Natural Cycle: 135												
Control Type: Actuated-Coordinated												
Splits and Phases: 4: Donval Road & Speers Road												

Queues
4: Dorval Road & Speers Road

Future Total AM (Phase 2)
Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group	451	658	43	87	446	342	76	1076	304	592	277
Lane Group Flow (vph)	0.94	0.70	0.09	0.35	0.65	0.54	0.20	0.97	0.98	0.40	0.37
v/c Ratio	79.4	42.4	0.3	27.9	52.2	15.1	18.1	60.6	71.8	10.6	3.1
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	79.4	42.4	0.3	27.9	52.2	15.1	18.1	60.6	71.8	10.6	3.1
Queue Length 50th (m)	54.8	74.3	0.0	6.9	55.9	43.2	8.5	129.7	37.1	38.9	10.9
Queue Length 95th (m)	#85.1	83.0	0.0	17.7	75.4	63.4	19.6	#174.3	#143.3	46.8	m15.0
Internal Link Dist (m)	412.3			472.1			621.6		110.0		494.4
Turn Bay Length (m)	60.0		60.0	85.0		55.0	70.0		110.0		148.3
Base Capacity (vph)	481	1192	600	256	949	639	387	1111	311	1483	754
Stavation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.55	0.07	0.34	0.47	0.54	0.20	0.97	0.98	0.40	0.37

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
4: Dorval Road & Speers Road

Future Total AM (Phase 2)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	11	11	1	11	11	1	11	11	1	1	1
Traffic Volume (vph)	415	605	40	80	410	315	70	860	130	280	445
Future Volume (vph)	415	605	40	80	410	315	70	860	130	280	445
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Frb. ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	0.98
Flbb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	3329	1482	1656	3256	1494	1785	3479	1687	3539	1417
Flt Permitted	0.95	1.00	1.00	0.32	1.00	1.00	0.43	1.00	0.10	1.00	1.00
Satd. Flow (perm)	3400	3329	1482	561	3256	1494	805	3479	169	3539	1417
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
Adj. Flow (vph)	451	658	43	87	446	342	76	935	141	304	592
RTOR Reduction (vph)	0	0	31	0	0	0	70	0	10	0	0
Lane Group Flow (vph)	451	658	12	87	446	272	76	1066	0	304	592
Confl. Peds. (#/hr)	5			5			5		5		5
Heavy Vehicles (%)	3%	8%	9%	9%	10%	7%	1%	2%	0%	7%	2%
Bus Blockages (#/hr)	0	2	0	0	4	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm-pt	NA	pm-pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2	1	6	
Permitted Phases			4			8		2			6
Actuated Green, G (s)	17.0	33.8	33.8	33.8	25.3	43.0	44.2	38.0	59.7	49.5	49.5
Effective Green, g (s)	17.0	33.8	33.8	33.8	25.3	43.0	44.2	38.0	59.7	49.5	49.5
Actuated g/C Ratio	0.14	0.28	0.28	0.28	0.21	0.36	0.37	0.32	0.50	0.41	0.41
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	481	937	417	235	686	535	347	1101	307	1459	584
v/s Ratio Prot	c0.13	c0.20		0.03	0.14	0.07	0.01	0.31	c0.15	0.17	
v/s Ratio Perm			0.01	0.08	0.03	0.11	0.07		c0.35		0.08
v/c Ratio	0.94	0.70	0.03	0.37	0.65	0.51	0.22	0.97	0.99	0.41	0.20
Uniform Delay, d1	51.0	38.6	31.2	32.8	43.3	30.2	25.0	40.4	36.9	24.9	22.5
Progression Factor	1.00	1.00	1.00	1.13	1.12	0.89	1.00	1.00	0.99	0.38	0.61
Incremental Delay, d2	26.0	3.0	0.1	1.0	2.9	0.7	0.3	20.4	40.9	0.6	0.5
Delay (s)	76.9	41.6	31.3	38.1	51.4	21.6	25.3	60.8	77.5	10.0	14.3
Level of Service	E	D	C	D	D	C	C	E	E	B	B
Approach Delay (s)		55.1			38.4			58.5		28.5	
Approach LOS		E			D			E		C	

Intersection Summary	HCM 2000 Level of Service	
HCM 2000 Control Delay	45.5	D
HCM 2000 Volume to Capacity ratio	0.95	
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	87.7%	ICU Level of Service
Analysis Period (min)	15	E

c Critical Lane Group

Timings
5. St. Augustine Drive & Speers Road

Queues
5. St. Augustine Drive & Speers Road

Future Total AM (Phase 2)
Upper Kerr Village (8724-01)

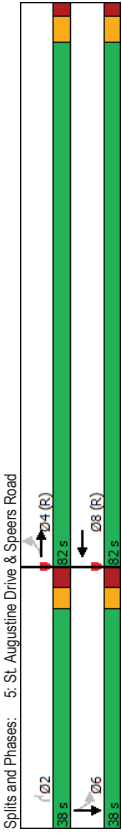
Future Total AM (Phase 2)
Upper Kerr Village (8724-01)

Lane Group	EBL	EBT	WBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	30	875	785	20	80	0
Future Volume (vph)	30	875	785	20	80	0
Turn Type	Perm	NA	NA	Perm	NA	NA
Protected Phases	4		8		6	
Permitted Phases	4		8		6	
Detector Phase	4		8		6	
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.9	23.9	23.9	24.3	24.3	24.3
Total Split (s)	82.0	82.0	82.0	38.0	38.0	38.0
Total Split (%)	68.3%	68.3%	68.3%	31.7%	31.7%	31.7%
Maximum Green (s)	76.1	76.1	76.1	31.7	31.7	31.7
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	2.2	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.9	5.9	6.3	6.3	6.3
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	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
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Min	C-Min	C-Min	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0

Lane Group	EBL	EBT	WBT	NBR	SBL	SBT
Lane Group Flow (vph)	34	1011	898	23	91	63
v/c Ratio	0.07	0.37	0.33	0.09	0.53	0.21
Control Delay	2.1	2.1	5.2	0.6	62.3	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.1	2.1	5.2	0.6	62.3	1.5
Queue Length 50th (m)	0.8	15.0	20.0	0.0	20.8	0.0
Queue Length 95th (m)	m1.6	m21.8	48.2	0.0	35.4	0.0
Internal Link Dist (m)		472.1	42.5			93.6
Turn Bay Length (m)		50.0				
Base Capacity (vph)	469	2754	2758	512	476	550
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 v/c Ratio	0.07	0.37	0.33	0.04	0.19	0.11

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.



5. St. Augustine Drive & Speers Road

Future Total AM (Phase 2)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	3	3	3	1	1	1	1	1	1	1	1	1
Traffic Volume (vph)	30	875	15	0	785	5	0	0	20	80	0	55
Future Volume (vph)	30	875	15	0	785	5	0	0	20	80	0	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9	5.9	5.9	5.9	5.9	6.3	6.3	6.3	6.3	6.3	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	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.86	1.00	0.85	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1797	3430	3434	3434	3434	3434	1565	1805	1615	1805	1615	1805
Flt Permitted	0.31	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	584	3430	3434	3434	3434	3434	1565	1805	1615	1805	1615	1805
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	34	994	17	0	892	6	0	0	23	91	0	62
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	21	0	0	57
Lane Group Flow (vph)	34	1010	0	0	898	0	0	0	2	91	0	6
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	0%	5%	0%	0%	5%	5%	0%	0%	5%	0%	0%	0%
Turn Type	Perm	NA	NA	NA	NA	NA	NA	NA	Perm	Perm	NA	NA
Protected Phases	4											6
Permitted Phases	4	96.4	96.4	96.4	96.4	96.4	11.4	11.4	11.4	11.4	11.4	11.4
Actuated Green, G (s)	96.4	96.4	96.4	96.4	96.4	96.4	11.4	11.4	11.4	11.4	11.4	11.4
Effective Green, g (s)	96.4	96.4	96.4	96.4	96.4	96.4	11.4	11.4	11.4	11.4	11.4	11.4
Actuated G/C Ratio	0.80	0.80	0.80	0.80	0.80	0.80	0.10	0.10	0.10	0.10	0.10	0.10
Clearance Time (s)	5.9	5.9	5.9	5.9	5.9	5.9	6.3	6.3	6.3	6.3	6.3	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	469	2755			2758		148	171	153			153
v/s Ratio Prot	c0.29				0.26							0.00
v/s Ratio Perm	0.06				0.33		0.00	c0.05				0.00
v/c Ratio	0.07	0.37			0.33		0.01	0.53	0.04			0.04
Uniform Delay, d1	2.5	3.3			3.1		49.2	51.8	49.3			49.3
Progression Factor	0.62	0.52			1.44		1.00	1.00	1.00			1.00
Incremental Delay, d2	0.2	0.3			0.3		0.0	3.2	0.1			0.1
Delay (s)	1.7	2.0			4.8		49.3	54.9	49.4			49.4
Level of Service	A	A			A		D	D	D			D
Approach Delay (s)	2.0	4.8			4.8		49.3	52.7	49.4			52.7
Approach LOS	A	A			A		D	D	D			D
Intersection Summary												
HCM 2000 Control Delay	7.4 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.38											
Actuated Cycle Length (s)	120.0 Sum of lost time (s)											
Intersection Capacity Utilization	48.7% ICU Level of Service											
Analysis Period (min)	15											
c Critical Lane Group												

6. Speers Road/Cornwall Road & Cross Avenue

Future Total AM (Phase 2)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	3	3	3	1	1	1	1	1	1	1	1	1
Traffic Volume (vph)	205	1255	615	5	245	5	0	0	20	80	0	55
Future Volume (vph)	205	1255	615	5	245	5	0	0	20	80	0	55
Turn Type	pm-pt	NA	NA	NA	Prot	Perm						
Protected Phases	5	2	6	4								
Permitted Phases	5	2	6	4	4	4						
Detector Phase	5	2	6	4	4	4						
Switch Phase	6.0	38.0	38.0	10.0	10.0	10.0						
Minimum Initial (s)	12.0	47.6	47.6	15.8	15.8	15.8						
Minimum Split (s)	35.0	109.0	74.0	31.0	31.0	31.0						
Total Split (%)	25.0%	77.9%	52.9%	22.1%	22.1%	22.1%						
Maximum Green (s)	29.0	102.4	67.4	25.2	25.2	25.2						
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3	3.3						
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5	2.5						
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0						
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8	5.8						
Lead/Lag	Lead	Lag	Lag									
Lead/Lag Optimize?	Yes	Yes	Yes									
Vehicle Extension (s)	3.5	5.0	5.0	3.0	3.0	3.0						
Minimum Gap (s)	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						
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0						
Recall Mode	None	C-Min	C-Min	None	None	None						
Walk Time (s)	10.0	10.0	10.0									
Flash Dont Walk (s)	31.0	31.0	31.0									
Pedestrian Calls (#/hr)	5	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: 6: Speers Road/Cornwall Road & Cross Avenue												
→ Ø2 (R)	109.5											
← Ø5	74.5											
← Ø6 (R)	31.5											
← Ø4	31.5											

Queues
6: Speers Road/Cornwall Road & Cross Avenue

Future Total AM (Phase 2)
Upper Kerr Village (8724-01)

	EBL	EBT	WBT	SBL	SBR
Lane Group	241	1476	748	6	288
Lane Group Flow (vph)	0.42	0.51	0.30	0.05	0.63
v/c Ratio	4.4	4.0	7.3	60.6	12.9
Control Delay	0.0	0.0	0.0	0.0	0.0
Queue Delay	4.4	4.0	7.3	60.6	12.9
Total Delay	9.4	46.8	33.8	1.6	0.0
Queue Length 50th (m)	14.5	55.7	44.0	5.7	11.7
Queue Length 95th (m)	474.4	77.5	60.0		
Internal Link Dist (m)	80.0		45.0		
Turn Bay Length (m)	723	2905	2501	324	705
Base Capacity (vph)	0	0	0	0	0
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	0.33	0.51	0.30	0.02	0.41
Intersection Summary					

HCM Signalized Intersection Capacity Analysis
6: Speers Road/Cornwall Road & Cross Avenue

Future Total AM (Phase 2)
Upper Kerr Village (8724-01)

	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔
Traffic Volume (vph)	205	1255	615	20	5
Future Volume (vph)	205	1255	615	20	5
Ideal Flow (vphpb)	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
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00
Fibb. 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)	1686	3471	3450	1805	2608
Flt Permitted	0.33	1.00	1.00	0.95	1.00
Satd. Flow (perm)	591	3471	3450	1805	2608
Peak-Hour factor, PHF	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	241	1476	724	24	6
RTOR Reduction (vph)	0	0	1	0	0
Lane Group Flow (vph)	241	1476	747	0	6
Confl. Peds. (#/hr)	5			5	
Heavy Vehicles (%)	7%	4%	4%	5%	9%
Turn Type	pm+pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2			4	
Actuated Green, G (s)	117.2	117.2	101.5	10.4	10.4
Effective Green, g (s)	117.2	117.2	101.5	10.4	10.4
Actuated g/C Ratio	0.84	0.84	0.72	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)	570	2905	2501	134	193
v/s Ratio Prot	0.03	c0.43	0.22	0.00	
v/c Ratio Perm	0.32			c0.01	
v/c Ratio	0.42	0.51	0.30	0.04	0.11
Uniform Delay, d1	2.8	3.2	6.8	60.2	60.5
Progression Factor	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.6	0.3	0.1	0.3
Delay (s)	3.4	3.9	7.1	60.3	60.7
Level of Service	A	A	A	E	E
Approach Delay (s)	3.8	7.1	60.7		
Approach LOS	A	A	E		
Intersection Summary					
HCM 2000 Control Delay	10.7		HCM 2000 Level of Service		
HCM 2000 Volume to Capacity ratio	0.50		B		
Actuated Cycle Length (s)	140.0		Sum of lost time (s)		
Intersection Capacity Utilization	69.2%		ICU Level of Service		
Analysis Period (min)	15		C		
c Critical Lane Group					

7: Kerr Street & Prince Charles Drive

8: Kerr Street & Elmwood Road

Future Total AM (Phase 2)

Future Total AM (Phase 2)

Future Total AM (Phase 2)

Future Total AM (Phase 2)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	0	5	5	0	40	5	545	5	40	390	5
Traffic Volume (veh/h)	5	0	5	5	0	40	5	545	5	40	390	5
Future Volume (Veh/h)	5	0	5	5	0	40	5	545	5	40	390	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	6	0	6	6	0	48	6	649	6	48	464	6
Pedestrians	15			30								
Lane Width (m)	3.6			3.6								
Walking Speed (m/s)	1.1			1.1								
Percent Blockage	1			3								
Right turn flare (veh)							None	None	None	None	None	None
Median type												
Median storage (veh)												
Upstream signal (m)							238					127
pX platoon unblocked	0.91	0.91	0.85	0.91	0.91	0.87	0.85			0.87		
VC conflicting volume	1290	1275	482	1263	1275	682	485			685		
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	960	943	299	930	943	565	303			568		
IC, single (s)	7.1	6.5	6.5	7.1	6.5	6.3	4.3			4.2		
IC, 2 stage (s)												
p0 queue free %	3.5	4.0	3.6	3.5	4.0	3.4	2.3			2.3		
IF (s)	97	100	99	97	100	89	99			94		
CM capacity (veh/h)	176	216	563	202	216	434	989			833		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1	EB 1	NB 1	SB 1					
Volume Total	12	54	661	518								
Volume Left	6	6	6	48								
Volume Right	6	48	6	6								
cSH	268	384	989	833								
Volume to Capacity	0.04	0.14	0.01	0.06								
Queue Length 95th (m)	1.1	3.7	0.1	1.4								
Control Delay (s)	19.1	15.9	0.2	1.6								
Lane LOS	C	C	A	A								
Approach Delay (s)	19.1	15.9	0.2	1.6								
Approach LOS	C	C	A	A								
Intersection Summary												
Average Delay	1.6											
Intersection Capacity Utilization	57.6%											
ICU Level of Service	B											
Analysis Period (min)	15											

Movement	EBL	EBR	NBL	NBT	SBR
Lane Configurations	W				
Traffic Volume (veh/h)	20	10	5	525	360
Future Volume (Veh/h)	20	10	5	525	360
Sign Control	Stop	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	24	12	6	618	424
Pedestrians	20			5	
Lane Width (m)	3.6			3.6	
Walking Speed (m/s)	1.1			1.1	
Percent Blockage	2			0	
Right turn flare (veh)				None	None
Median type				None	None
Median storage (veh)					
Upstream signal (m)				103	262
pX platoon unblocked	0.89	0.92	0.92		
VC conflicting volume	1082	466	479		
VC1, stage 1 conf vol					
VC2, stage 2 conf vol					
VCU, unblocked vol	845	379	392		
IC, single (s)	6.4	6.2	4.1		
IC, 2 stage (s)					
p0 queue free %	92	98	99		
IF (s)	283	606	1065		
CM capacity (veh/h)					
Direction, Lane #	EB 1	NB 1	SB 1		
Volume Total	36	624	459		
Volume Left	24	6	0		
Volume Right	12	0	35		
cSH	353	1065	1700		
Volume to Capacity	0.10	0.01	0.27		
Queue Length 95th (m)	2.6	0.1	0.0		
Control Delay (s)	16.3	0.2	0.0		
Lane LOS	C	A	A		
Approach Delay (s)	16.3	0.2	0.0		
Approach LOS	C	A	A		
Intersection Summary					
Average Delay	0.6				
Intersection Capacity Utilization	43.2%				
ICU Level of Service	A				
Analysis Period (min)	15				

Timings
9: Kerr Street & Stewart Street

Queues
9: Kerr Street & Stewart Street

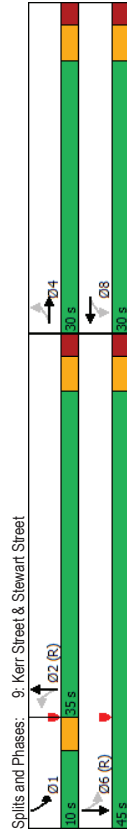
Future Total AM (Phase 2)
Upper Kerr Village (8724-01)

Future Total AM (Phase 2)
Upper Kerr Village (8724-01)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	35	25	20	35	5	420	40	290
Traffic Volume (vph)	35	25	20	35	5	420	40	290
Future Volume (vph)	Perm	NA	Perm	NA	Perm	NA	prn+pt	NA
Turn Type	4	8	8	2	2	1	6	6
Permitted Phases	4	8	8	2	2	1	6	6
Detector Phase	4	8	8	2	2	1	6	6
Switch Phase	10.0	10.0	10.0	10.0	24.0	24.0	6.0	24.0
Minimum Initial (s)	30.0	30.0	30.0	30.0	32.0	32.0	10.0	32.0
Minimum Split (s)	30.0	30.0	30.0	30.0	35.0	35.0	10.0	45.0
Total Split (s)	40.0%	40.0%	40.0%	40.0%	46.7%	46.7%	13.3%	60.0%
Total Split (%)	24.6	24.6	24.6	24.6	29.6	29.6	7.0	39.6
Maximum Green (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.0	3.3
Yellow Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	2.1
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Total Lost Time (s)	Lead/Lag	Lag	Lag	Lead	Lead	Lead	Yes	Yes
Lead/Lag	Yes	Yes	Yes	Yes	Yes	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

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	79	152	542	440
v/c Ratio	0.28	0.40	0.47	0.43
Control Delay	23.8	14.2	9.6	9.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.8	14.2	9.6	9.2
Queue Length 50th (m)	9.6	8.7	24.6	18.8
Queue Length 95th (m)	15.4	16.8	61.6	49.6
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)	459	559	1156	1032
Base Capacity (vph)	0	0	0	0
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	0.17	0.27	0.47	0.43

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



9: Kerr Street & Stewart Street

Future Total AM (Phase 2)

Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	35	25	5	20	35	70	5	420	20	40	290	30
Traffic Volume (vph)	35	25	5	20	35	70	5	420	20	40	290	30
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpt)	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99	1.00	0.99
Fpb. ped/bikes	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Frt	0.97	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	1701	1612	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775
Satd. Flow (prot)	0.79	0.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Permitted	1388	1532	1769	1769	1769	1769	1769	1769	1769	1769	1769	1769
Satd. Flow (perm)	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Peak-hour factor, PHF	43	30	6	24	43	85	6	512	24	49	354	37
Adj. Flow (vph)	0	5	0	0	68	0	0	1	0	0	3	0
RTOR Reduction (vph)	0	74	0	0	84	0	0	541	0	0	437	0
Lane Group Flow (vph)	20	20	20	20	20	30	30	35	35	35	30	30
Confl. Peds. (#/hr)	2%	7%	16%	0%	5%	4%	28%	6%	0%	2%	6%	6%
Heavy Vehicles (%)	0	2	0	0	2	0	0	0	0	0	0	4
Bus Blockages (#/hr)	Perm	NA	NA	Perm	NA	Perm	NA	NA	pm-pt	NA	NA	NA
Turn Type	4	8	2	8	2	2	1	6	6	6	6	6
Protected Phases	15.2	15.2	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0
Actuated Green, G (s)	0.20	0.20	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Effective Green, g (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Actuated g/C Ratio	281	310	1155	1155	1155	1155	1155	1155	1155	1155	1155	1029
Clearance Time (s)	0.05	0.26	0.27	0.27	0.47	0.47	0.42	0.42	0.42	0.42	0.42	0.28
Vehicle Extension (s)	25.2	25.2	6.5	6.5	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Lane Grp Cap. (vph)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
v/s Ratio Prot	0.7	0.6	0.6	0.6	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
v/s Ratio Perm	25.9	25.9	7.9	7.9	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Uniform Delay, d1	C	C	A	A	A	A	A	A	A	A	A	A
Progression Factor	25.9	25.9	7.9	7.9	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Incremental Delay, d2	C	C	A	A	A	A	A	A	A	A	A	A
Level of Service	C	C	A	A	A	A	A	A	A	A	A	A
Approach Delay (s)	C	C	A	A	A	A	A	A	A	A	A	A
Approach LOS	C	C	A	A	A	A	A	A	A	A	A	A
Intersection Summary	<p>Intersection Summary</p> <p>Control Type: Actuated-Coordinated</p> <p>Actuated Cycle Length: 120</p> <p>Offset: 118 (98%), Referenced to phase 2:NETL and 6:SBT, Start of Green</p> <p>Natural Cycle: 90</p>											
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service										
HCM 2000 Volume to Capacity ratio	0.44	B										
Actuated Cycle Length (s)	75.0	Sum of lost time (s)										
Intersection Capacity Utilization	66.5%	ICU Level of Service										
Analysis Period (min)	15	C										
Critical Lane Group	c											

10: Donval Road & Wyecroft Road

Future Total AM (Phase 2)

Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	
Lane Configurations	17	4	3	8	2	2	5	2	1	6	6	
Traffic Volume (vph)	215	120	20	125	110	1385	150	1045	150	1045	1045	
Future Volume (vph)	215	120	20	125	110	1385	150	1045	150	1045	1045	
Turn Type	Prot	NA	pm-pt	NA	pm-pt	NA	Prot	NA	Prot	NA	6	
Protected Phases	7	4	3	8	2	2	5	2	1	6	6	
Detector Phase	7	4	3	8	2	2	5	2	1	6	6	
Switch Phase	7.0	10.0	7.0	10.0	7.0	20.0	7.0	20.0	7.0	20.0	20.0	
Minimum Initial (s)	12.0	25.0	12.0	25.0	12.0	41.0	12.0	41.0	12.0	41.0	41.0	
Minimum Split (s)	21.0	40.0	21.0	40.0	17.0	42.0	17.0	42.0	17.0	42.0	42.0	
Total Split (%)	17.5%	33.3%	17.5%	33.3%	14.2%	35.0%	14.2%	35.0%	14.2%	35.0%	35.0%	
Maximum Green (s)	16.0	33.0	16.0	33.0	12.0	35.0	12.0	35.0	12.0	35.0	35.0	
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	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	
Total Lost Time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	7.0	
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Gap (s)	3.0	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	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	0.0	
Recall Mode	None	None	None	None	None	None	None	None	None	None	C-Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	27.0	11.0	27.0	11.0	27.0	27.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	
Intersection Summary	<p>Intersection Summary</p> <p>Control Type: Actuated-Coordinated</p> <p>Cycle Length: 120</p> <p>Actuated Cycle Length: 120</p> <p>Offset: 118 (98%), Referenced to phase 2:NETL and 6:SBT, Start of Green</p> <p>Natural Cycle: 90</p>											
Splits and Phases	<p>Splits and Phases: 10: Donval Road & Wyecroft Road</p> <p>Phase 1: 17 s (EBL), 17 s (EBT), 17 s (EBR), 17 s (WBL), 17 s (WBT), 17 s (WBR), 17 s (NBL), 17 s (NBT), 17 s (NBR), 17 s (SBL), 17 s (SBT), 17 s (SBR)</p> <p>Phase 2: 42 s (EBL), 42 s (EBT), 42 s (EBR), 42 s (WBL), 42 s (WBT), 42 s (WBR), 42 s (NBL), 42 s (NBT), 42 s (NBR), 42 s (SBL), 42 s (SBT), 42 s (SBR)</p> <p>Phase 3: 21 s (EBL), 21 s (EBT), 21 s (EBR), 21 s (WBL), 21 s (WBT), 21 s (WBR), 21 s (NBL), 21 s (NBT), 21 s (NBR), 21 s (SBL), 21 s (SBT), 21 s (SBR)</p> <p>Phase 4: 17 s (EBL), 17 s (EBT), 17 s (EBR), 17 s (WBL), 17 s (WBT), 17 s (WBR), 17 s (NBL), 17 s (NBT), 17 s (NBR), 17 s (SBL), 17 s (SBT), 17 s (SBR)</p>											

Queues
10: Dorval Road & Wynecroft Road

Future Total AM (Phase 2)
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	234	239	22	391	120	1570	163	1614
v/c Ratio	0.60	0.29	0.08	0.67	0.55	0.70	0.44	0.73
Control Delay	56.6	21.4	26.3	25.2	27.5	17.3	53.6	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.6	21.4	26.3	25.2	27.5	17.3	53.6	28.7
Queue Length 50th (m)	27.0	11.9	3.6	18.3	8.6	97.6	18.8	105.3
Queue Length 95th (m)	40.0	24.5	9.0	32.5	m12.9	m142.9	28.7	146.5
Internal Link Dist (m)	155.6			199.3	494.4			672.1
Turn Bay Length (m)	115.0		145.0		65.0		125.0	
Base Capacity (vph)	416	934	361	1030	237	2258	382	2197
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.26	0.06	0.38	0.51	0.70	0.43	0.73
Intersection Summary								
m Volume for 95th percentile queue is metered by upstream signal.								

HCM Signalized Intersection Capacity Analysis
10: Dorval Road & Wynecroft Road

Future Total AM (Phase 2)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	TT	TT	T	T	TT	TT	TT	TT
Traffic Volume (vph)	215	120	100	20	235	110	1385	60
Future Volume (vph)	215	120	100	20	235	110	1385	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Lane Util. Factor	0.97	0.95	1.00	0.95	1.00	0.91	0.97	0.91
Fpb. ped/bikes	1.00	0.99	1.00	0.99	1.00	1.00	1.00	1.00
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.93	1.00	0.90	1.00	0.99	1.00	0.96
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3127	3079	1637	3128	1641	5036	3433	4676
Flt Permitted	0.95	1.00	0.60	1.00	0.08	1.00	0.95	1.00
Satd. Flow (perm)	3127	3079	1039	3128	136	5036	3433	4676
Peak-Hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	234	130	109	22	235	120	1505	65
RTOR Reduction (vph)	0	83	0	0	201	0	3	0
Lane Group Flow (vph)	234	156	0	22	190	0	120	1567
Confl. Peds. (#/hr)	2	3	3	3	2	1	1	1
Heavy Vehicles (%)	12%	7%	9%	10%	5%	2%	10%	2%
Bus Blockages (#/hr)	0	2	0	0	0	0	3	0
Turn Type	Prot	NA	NA	pm+pt	NA	pm+pt	NA	Prot
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	14.9	28.5	21.4	17.5	62.2	50.7	12.9	52.1
Actuated Green, G (s)	14.9	28.5	21.4	17.5	62.2	50.7	12.9	52.1
Effective Green, g (s)	0.12	0.24	0.18	0.15	0.52	0.42	0.11	0.43
Actuated g/C Ratio	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	388	731	204	456	214	2127	369	2030
Lane Grp Cap (vph)	c0.07	0.05	0.00	c0.06	c0.05	0.31	0.05	c0.33
v/s Ratio Prot	0.60	0.21	0.11	0.42	0.56	0.74	0.44	0.77
v/s Ratio Perm	49.8	36.7	41.1	46.6	19.7	28.1	50.2	28.9
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.24	0.59	1.00	1.00
Progression Factor	3.9	0.3	0.5	1.3	2.5	1.1	1.8	2.9
Incremental Delay, d2	53.6	37.1	41.6	47.9	26.9	18.1	51.9	31.8
Delay (s)	D	D	D	D	C	B	D	C
Level of Service	D	D	D	D	C	B	D	C
Approach Delay (s)	D	D	D	D	B	B	D	C
Approach LOS	D	D	D	D	B	B	D	C
Intersection Summary								
HCM 2000 Control Delay	30.4		HCM 2000 Level of Service		C			
HCM 2000 Volume to Capacity ratio	0.65							
Actuated Cycle Length (s)	120.0							
Sum of lost time (s)	24.0							
Intersection Capacity Utilization	73.7%							
ICU Level of Service	D							
Analysis Period (min)	15							
Critical Lane Group	c							

11: Speers Road & Interim Connection

Future Total AM (Phase 2)
Upper Kerr Village (8/7/24-01)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	0	975	755	30	0	35
Future Volume (Veh/h)	0	975	755	30	0	35
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1060	821	33	0	38
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLT	TL	TWLT	TL		
Median storage (veh)	2	2				
Upstream signal (m)	66	169				
pX platoon unblocked	0.87			0.91	0.87	
VC conflicting volume	854			1368	427	
VC1, stage 1 conf vol				838		
VC2, stage 2 conf vol				530		
VCU unblocked vol	528			808	36	
IC, single (s)	4.1			6.8	6.9	
IC, 2 stage (s)	2.2			5.8	3.3	
p0 queue free %	100			100	96	
IC capacity (veh/h)	911			453	898	
Direction_Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1 SB 2
Volume Total	0	530	530	547	307	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	33	0
cSH	1700	1700	1700	1700	1700	898
Volume to Capacity	0.00	0.31	0.31	0.32	0.18	0.11
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	1.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	9.2
Lane LOS	A	A	A	A	A	A
Approach Delay (s)	0.0			0.0		9.2
Approach LOS				A		A
Intersection Summary						
Average Delay	0.2					
Intersection Capacity Utilization	31.8%					
ICU Level of Service	A					
Analysis Period (min)	15					

14: Kerr Street & Rail Track

Future Total AM (Phase 2)
Upper Kerr Village (8/7/24-01)

Lane Group	NBT	SBT	Ø4
Lane Configurations	↔	↔	↔
Traffic Volume (vph)	515	510	
Future Volume (vph)	515	510	
Turn Type	NA	NA	
Protected Phases	2	6	4
Permitted Phases	2	6	
Detector Phase			
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	22.0	22.0	22.0
Total Split (s)	140.0	140.0	40.0
Total Split (%)	77.8%	77.8%	22%
Maximum Green (s)	138.0	138.0	38.0
Yellow Time (s)	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	
Total Lost Time (s)	2.0	2.0	
Lead/Lag			
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0
Recall Mode	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0
Intersection Summary			
Cycle Length	180		
Actuated Cycle Length	180		
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 45			
Control Type: Prelimed			
Splits and Phases: 14: Kerr Street & Rail Track			
Ø2 (R)	↔		↔
Ø4	↔		↔
Ø6 (R)	↔		↔
Ø4	↔		↔
Ø6 (R)	↔		↔
Ø4	↔		↔
Ø6 (R)	↔		↔

Queues
14.: Kerr Street & Rail Track

Future Total AM (Phase 2)
Upper Kerr Village (8724-01)

	NBT	SBT	SBT
Lane Group	560	554	
Lane Group Flow (vph)	0.39	0.39	
v/c Ratio	7.9	7.9	
Control Delay	54.7	0.0	
Queue Delay	62.6	7.9	
Total Delay	60.7	60.3	
Queue Length 50th (m)	77.5	77.1	
Queue Length 95th (m)	21.4	418.6	
Internal Link Dist (m)			
Turn Bay Length (m)	1442	1414	
Base Capacity (vph)	951	0	
Starvation Cap Reductn	0	0	
Spillback Cap Reductn	0	0	
Storage Cap Reductn	1.14	0.39	
Reduced v/c Ratio			
Intersection Summary			

HCM Signalized Intersection Capacity Analysis
14.: Kerr Street & Rail Track

Future Total AM (Phase 2)
Upper Kerr Village (8724-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔										↔
Traffic Volume (vph)	0	0	0	0	0	0	0	515	0	0	510	0
Future Volume (vph)	0	0	0	0	0	0	0	515	0	0	510	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)								2.0				2.0
Lane Util. Factor								1.00				1.00
Flt Protected								1.00				1.00
Satd. Flow (prot)								1881				1845
Flt Permitted								1.00				1.00
Satd. Flow (perm)								1881				1845
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)	0	0	0	0	0	0	0	560	0	0	554	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	560	0	0	554	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	3%	0%
Turn Type								NA			NA	
Protected Phases		4						2			6	
Permitted Phases												
Actuated Green, G (s)								138.0			138.0	
Effective Green, g (s)								138.0			138.0	
Actuated g/C Ratio								0.77			0.77	
Clearance Time (s)								2.0			2.0	
Lane Grp Cap (vph)								1442			1414	
v/s Ratio Prot								0.30			cd.30	
v/c Ratio								0.39			0.39	
Uniform Delay, d1								7.0			7.0	
Progression Factor								1.00			1.00	
Incremental Delay, d2								0.8			0.8	
Delay (s)								7.8			7.8	
Level of Service								A			A	
Approach Delay (s)		0.0		0.0				7.8			7.8	
Approach LOS		A		A				A			A	
Intersection Summary												
HCM 2000 Control Delay								7.8			HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio								0.31				
Actuated Cycle Length (s)								180.0			Sum of lost time (s)	4.0
Intersection Capacity Utilization								30.4%			ICU Level of Service	A
Analysis Period (min)								15				
c. Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
 1: Kerr Street & Wycroft Road

Future Total PM (Phase 2)
 Upper Kerr Village (8/7/24-01)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	25	140	125	615	520	110
Future Volume (Veh/h)	25	140	125	615	520	110
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	27	151	134	661	559	118
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)				None	None	None
Median type						
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	1222	344	682			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	1222	344	682			
IC, single (s)	6.8	7.0	4.2			
IC, 2 stage (s)						
IF (s)	3.5	3.3	2.3			
p0 queue free %	82	77	85			
CM capacity (veh/h)	148	644	876			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	27	151	134	330	330	373 304
Volume Left	27	0	134	0	0	0 0
Volume Right	0	151	0	0	0	0 118
cSH	148	644	876	1700	1700	1700 1700
Volume to Capacity	0.18	0.23	0.15	0.19	0.19	0.22 0.18
Queue Length 95th (m)	4.9	6.9	4.1	0.0	0.0	0.0 0.0
Control Delay (s)	34.8	12.3	9.8	0.0	0.0	0.0 0.0
Lane LOS	D	B	A			
Approach Delay (s)	15.7		1.7			0.0
Approach LOS	C					
Intersection Summary						
Average Delay	2.5					
Intersection Capacity Utilization	38.2%					
ICU Level of Service	A					
Analysis Period (min)	15					

Timings
 2: Kerr Street & Shepherd Road

Future Total PM (Phase 2)
 Upper Kerr Village (8/7/24-01)

Lane Group	WBL	WBT	NBT	NBR	SBL	SBT	Ø4
Lane Configurations	↔	↔	↔	↔	↔	↔	
Traffic Volume (vph)	105	0	545	110	155	470	
Future Volume (vph)	105	0	545	110	155	470	
Turn Type	Perm	NA	NA	Perm	pm+pt	NA	
Protected Phases	8		2		1	6	4
Permitted Phases	8		2	2	6		
Detector Phase	8		2	2	1	6	
Switch Phase							
Minimum Initial (s)	5.0	5.0	18.0	18.0	7.0	18.0	5.0
Minimum Split (s)	22.0	22.0	28.2	28.2	11.0	28.2	22.0
Total Split (s)	33.0	33.0	53.0	53.0	22.0	75.0	33.0
Total Split (%)	30.6%	30.6%	49.1%	49.1%	20.4%	69.4%	31%
Maximum Green (s)	29.0	29.0	47.8	47.8	18.0	69.8	29.0
Yellow Time (s)	3.0	3.0	3.3	3.3	4.0	3.3	3.0
All-Red Time (s)	1.0	1.0	1.9	1.9	0.0	1.9	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	5.2	5.2	4.0	5.2	4.0
Lead/Lag			Lag	Lag	Lead		
Lead-Lag Optimize?			Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.5	3.5	2.5	3.5	3.0
Minimum Gap (s)	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
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	Min	Min	None	Min	None
Walk Time (s)	7.0	7.0	10.0	10.0	10.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	13.0	13.0	13.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	5	5	5	5	0
Intersection Summary							
Cycle Length	108						
Actuated Cycle Length	49.4						
Natural Cycle	65						
Control Type	Semi Act-Uncooord						
Splits and Phases: 2: Kerr Street & Shepherd Road							
	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	
	23.6	53.3	53.3	33.3	53.3	23.6	

Queues
2: Kerr Street & Shepherd Road

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group	108	149	562	113	160	485
Lane Group Flow (vph)	0.42	0.23	0.41	0.17	0.27	0.22
v/c Ratio	23.5	0.8	12.8	3.7	5.1	4.7
Control Delay	0.0	0.0	0.0	0.0	0.3	0.1
Queue Delay	23.5	0.8	12.8	3.7	5.4	4.8
Total Delay	8.0	0.0	17.3	0.0	4.2	7.7
Queue Length 50th (m)	21.6	0.0	33.5	7.6	11.5	16.1
Queue Length 95th (m)	241.3	143.2				21.4
Internal Link Dist (m)						
Turn Bay Length (m)				50.0		
Base Capacity (vph)	790	1084	3374	1467	847	3574
Starvation Cap Reductn	0	0	0	0	338	1608
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.14	0.17	0.08	0.31	0.25
Intersection Summary						

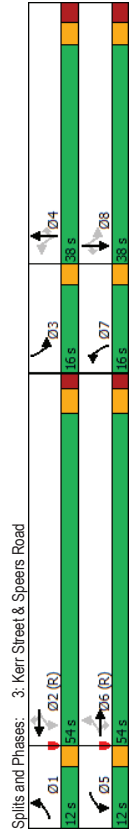
HCM Signalized Intersection Capacity Analysis
2: Kerr Street & Shepherd Road

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB	
Traffic Volume (vph)	0	0	0	105	0	145	0	545	110	155	470	0	
Future Volume (vph)	0	0	0	105	0	145	0	545	110	155	470	0	
Ideal Flow (vphpb)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)				4.0	4.0			5.2	5.2	4.0	5.2		
Lane Util. Factor				1.00	1.00			0.95	1.00	1.00	0.95		
Fpb. ped/bikes				1.00	0.97			1.00	0.97	1.00	1.00		
Fpb. ped/bikes				0.98	1.00			1.00	1.00	1.00	1.00		
Frt				1.00	0.85			1.00	0.85	1.00	1.00		
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00		
Satd. Flow (prot)				1716	1538			3539	1543	1804	3574		
Flt Permitted				0.76	1.00			1.00	1.00	0.95	1.00		
Satd. Flow (perm)				1368	1538			3539	1543	665	3574		
Peak-Hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	
Adj. Flow (vph)	0	0	0	108	0	149	0	562	113	160	485	0	
RTOR Reduction (vph)	0	0	0	0	120	0	0	0	69	0	0	0	
Lane Group Flow (vph)	0	0	0	108	29	0	0	562	44	160	485	0	
Confl. Peds. (#/hr)	5	15	15	5	5	5	5	5	5	5	5	5	
Heavy Vehicles (%)	0%	0%	0%	3%	0%	1%	0%	2%	0%	1%	0%	0%	
Bus Blockages (#/hr)	0	0	0	0	3	0	0	5	0	0	0	0	
Turn Type	Perm	Perm	NA	NA	NA	Perm	NA	NA	Perm	pm-pt	NA	Perm	
Protected Phases	4	8	8	8	8	2	2	2	2	6	6	6	
Permitted Phases	4	8	9.5	9.5	9.5	19.1	19.1	19.1	30.7	30.7	30.7	30.7	
Actuated Green, G (s)	9.5	9.5	9.5	9.5	9.5	19.1	19.1	19.1	30.7	30.7	30.7	30.7	
Effective Green, g (s)	0.19	0.19	0.19	0.19	0.19	0.39	0.39	0.39	0.62	0.62	0.62	0.62	
Actuated g/C Ratio	4.0	4.0	4.0	4.0	4.0	5.2	5.2	5.2	4.0	4.0	5.2	5.2	
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.5	3.5	3.5	2.5	2.5	3.5	3.5	
Vehicle Extension (s)	263	295	263	295	263	596	596	596	588	588	2221	2221	
Lane Grp Cap (vph)													
v/s Ratio Prot													
v/s Ratio Perm													
v/c Ratio	0.41	0.10	0.41	0.10	0.07	0.27	0.22	0.22	0.22	0.22	0.22	0.22	
Uniform Delay, d1	17.5	16.4	17.5	16.4	11.0	9.6	4.2	4.1	4.1	4.1	4.1	4.1	
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	1.0	0.1	1.0	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.1	
Delay (s)	18.5	16.6	18.5	16.6	11.3	9.6	4.4	4.2	4.2	4.2	4.2	4.2	
Level of Service	B	B	B	B	B	A	A	A	A	A	A	A	
Approach Delay (s)	0.0	17.4	0.0	17.4	11.0	4.2	4.2	4.2	4.2	4.2	4.2	4.2	
Approach LOS	A	B	A	B	B	A	A	A	A	A	A	A	
Intersection Summary													
HCM 2000 Control Delay	9.3											HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39												
Actuated Cycle Length (s)	49.4											Sum of lost time (s)	13.2
Intersection Capacity Utilization	54.9%											ICU Level of Service	A
Analysis Period (min)	15												
c. Critical Lane Group													

Timings 3: Kerr Street & Speers Road Future Total PM (Phase 2) Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	95	610	140	300	965	445	155	160	235	260	250	100
Future Volume (vph)	95	610	140	300	965	445	155	160	235	260	250	100
Turn Type	pm-pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6	6	2	2	2	4	4	4	4	3	8
Permitted Phases	1	6	6	2	2	2	4	4	4	4	3	8
Detector Phase												
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	16.0	38.0	38.0	16.0	38.0	38.0
Total Split (%)	10.0%	45.0%	45.0%	10.0%	45.0%	45.0%	13.3%	31.7%	31.7%	13.3%	31.7%	31.7%
Maximum Green (s)	9.0	48.1	48.1	9.0	48.1	48.1	13.0	31.7	31.7	13.0	31.7	31.7
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	Lead	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
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
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	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	14.0	14.0
Pedestrian Calls (#/hr)	15	15	15	15	15	15	35	35	35	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 3: Kerr Street & Speers Road Future Total PM (Phase 2) Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	100	642	147	316	1016	468	163	168	247	274	263	105
v/c Ratio	0.33	0.41	0.19	0.65	0.58	0.48	0.53	0.52	0.53	0.71	0.73	0.28
Control Delay	12.5	23.6	9.7	21.6	25.0	3.9	34.0	49.0	9.1	41.1	57.1	8.8
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	12.5	23.6	9.7	21.6	25.0	3.9	34.0	49.0	9.1	41.1	57.1	8.8
Queue Length 50th (m)	11.8	53.1	8.8	34.1	87.8	0.0	27.4	35.6	0.0	49.4	58.9	0.0
Queue Length 95th (m)	26.0	94.4	20.0	#68.0	128.5	20.2	39.5	52.6	19.7	65.8	80.6	13.4
Internal Link Dist (m)	138.4			474.4			103.4				143.2	
Turn Bay Length (m)	105.0		75.0	75.0		100.0	50.0		45.0	80.0		75.0
Base Capacity (vph)	323	1572	780	484	1740	967	324	495	574	388	501	473
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	0.31	0.41	0.19	0.65	0.58	0.48	0.50	0.34	0.43	0.71	0.52	0.22
Intersection Summary												
# 95th percentile volume exceeds capacity, queue may be longer.												
Queue shown is maximum after two cycles.												

3: Kerr Street & Speers Road

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	95	610	140	300	965	445	155	160	235	260	250	100
Future Volume (vph)	95	610	140	300	965	445	155	160	235	260	250	100
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	1.00	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.93	1.00	1.00	0.98	1.00
Frb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	0.98	1.00
Flt Protected	0.95	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Satd. Flow (prot)	1803	3511	1560	1750	3539	1485	1768	1877	1486	1754	1900	1501
Flt Permitted	0.21	1.00	1.00	0.32	1.00	1.00	0.36	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)	389	3511	1560	568	3539	1485	663	1877	1486	886	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)	100	642	147	316	1016	468	163	168	247	274	263	105
RTOR Reduction (vph)	0	0	81	0	0	238	0	0	204	0	0	85
Lane Group Flow (vph)	100	642	66	316	1016	230	163	168	43	274	263	20
Confl. Peds. (#/hr)	30	5	5	5	30	35	35	35	35	35	35	35
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	1%	0%	0%
Bus Blockages (#/hr)	0	4	0	0	0	0	0	3	0	0	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	2	7	4	4	3	8	8	8
Permitted Phases	6	6	2	2	2	4	4	4	8	8	8	8
Actuated Green, G (s)	62.0	53.8	53.8	70.2	59.0	32.7	20.9	20.9	36.5	22.8	22.8	22.8
Effective Green, g (s)	62.0	53.8	53.8	70.2	59.0	32.7	20.9	20.9	36.5	22.8	22.8	22.8
Actuated G/C Ratio	0.52	0.45	0.45	0.59	0.49	0.27	0.17	0.17	0.30	0.19	0.19	0.19
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	2.5	4.0	4.0	2.5	4.0	4.0	4.0
Lane Grp Cap. (vph)	297	1574	689	473	1740	730	289	326	258	370	361	285
v/s Ratio Prot	0.02	0.18	0.04	c0.07	0.29	0.06	0.09	0.03	c0.08	0.14	0.01	0.01
v/s Ratio Perm	0.15	0.41	0.09	0.67	0.58	0.32	0.56	0.52	0.17	0.74	0.73	0.07
Uniform Delay, d1	15.9	22.3	19.1	13.7	21.7	18.3	35.3	45.0	42.1	35.3	45.7	39.9
Progression Factor	0.83	0.96	2.47	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.8	0.3	3.2	1.4	1.1	2.0	1.8	0.4	7.4	7.7	0.1
Delay (s)	13.7	22.2	47.3	16.9	23.2	19.5	37.4	46.8	42.6	42.6	53.3	40.0
Level of Service	B	C	D	B	C	B	D	D	D	D	D	D
Approach Delay (s)	25.4	C	C	21.1	C	42.3	D	D	D	46.6	D	D
Approach LOS	C	C	C	C	C	D	D	D	D	D	D	D
Intersection Summary												
HCM 2000 Control Delay	29.4 HCM 2000 Level of Service C											
HCM 2000 Volume to Capacity ratio	0.72											
Actuated Cycle Length (s)	120.0 Sum of lost time (s) 18.2											
Intersection Capacity Utilization	83.4% ICU Level of Service E											
Analysis Period (min)	15											
Critical Lane Group	c											

4: Dorval Road & Speers Road

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	
Traffic Volume (vph)	415	520	50	175	710	525	65	645	290	720	375	
Future Volume (vph)	415	520	50	175	710	525	65	645	290	720	375	
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm-pt	NA	pm+pt	NA	Perm	
Protected Phases	7	4	3	8	1	5	2	1	6	6	6	
Detector Phases	7	4	4	3	8	1	5	2	1	6	6	
Switch Phase	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	7.0	20.0	20.0	
Minimum Initial (s)	11.0	42.0	42.0	11.0	42.0	11.0	11.0	40.0	11.0	40.0	40.0	
Minimum Split (s)	19.0	44.0	44.0	17.0	42.0	19.0	11.0	40.0	19.0	48.0	48.0	
Total Split (s)	15.8%	36.7%	36.7%	14.2%	35.0%	15.8%	9.2%	33.3%	15.8%	40.0%	40.0%	
Maximum Green (s)	15.0	37.0	37.0	13.0	35.0	15.0	7.0	33.0	15.0	41.0	41.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	3.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	1.0	1.0	3.0	1.0	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	
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0	
Minimum Gap (s)	3.0	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	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	0.0	
Recall Mode	None	None	None	None	None	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	7.0	7.0	7.0	
Flash Dont Walk (s)	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	
Pedestrian Calls (#/hr)	5	5	5	5	5	5	5	5	5	5	5	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 17 (14%), Referenced to phase 2:NBLT and 6:SBTL, Start of Green												
Natural Cycle: 115												
Control Type: Actuated-Coordinated												
Splits and Phases: 4: Dorval Road & Speers Road												

Queues
4: Dorval Road & Speers Road

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	451	565	54	190	772	571	71	788	315	783	408
v/c Ratio	0.99	0.52	0.09	0.49	0.79	0.77	0.26	0.83	0.95	0.59	0.50
Control Delay	92.1	36.2	0.3	38.5	63.4	31.1	21.3	49.5	74.7	16.1	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	92.1	36.2	0.3	38.5	63.4	31.1	21.3	49.5	74.7	16.1	2.5
Queue Length 50th (m)	~59.7	57.5	0.0	33.9	89.1	52.8	9.2	90.1	~47.1	62.5	4.6
Queue Length 95th (m)	#91.8	74.6	0.0	63.0	120.2	115.0	17.7	113.5	#18.8	31.2	4.1
Internal Link Dist (m)	412.3			472.1			621.6			494.4	
Turn Bay Length (m)	60.0		60.0	85.0		55.0	70.0		110.0		
Base Capacity (vph)	456	1106	583	399	1034	738	277	974	330	1319	813
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.51	0.09	0.48	0.75	0.77	0.26	0.81	0.95	0.59	0.50
Intersection Summary											
~ Volume exceeds capacity, queue is theoretically infinite.											
Queue shown is maximum after two cycles.											
# 95th percentile volume exceeds capacity, queue may be longer.											
Queue shown is maximum after two cycles.											

HCM Signalized Intersection Capacity Analysis
4: Dorval Road & Speers Road

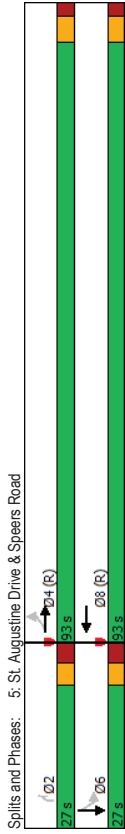
Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	TT	TT	T	T	T	T	T	T	T	T	T
Traffic Volume (vph)	415	520	50	175	710	525	65	645	80	290	375
Future Volume (vph)	415	520	50	175	710	525	65	645	80	290	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3560	1556	1786	3546	1581	1805	3515	1787	3574	1599
Flt Permitted	0.95	1.00	1.00	0.37	1.00	1.00	0.31	1.00	0.13	1.00	1.00
Satd. Flow (perm)	3433	3560	1556	690	3546	1581	587	3515	235	3574	1599
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
Adj. Flow (vph)	451	565	54	190	772	571	71	701	87	315	408
RTOR Reduction (vph)	0	0	37	0	0	43	0	8	0	0	225
Lane Group Flow (vph)	451	565	17	190	772	528	71	780	0	315	183
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	2%	1%	2%	1%	1%	1%	0%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	2	0	0	4	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm-pt	NA	pm-pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2	1	6	
Permitted Phases			4			8		2			6
Actuated Green, G (s)	15.9	36.9	36.9	44.8	32.9	50.0	37.7	32.1	53.2	43.6	43.6
Effective Green, g (s)	15.9	36.9	36.9	44.8	32.9	50.0	37.7	32.1	53.2	43.6	43.6
Actuated g/C Ratio	0.13	0.31	0.31	0.37	0.27	0.42	0.31	0.27	0.44	0.36	0.36
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0
Lane Grp Cap (vph)	454	1094	478	366	972	658	241	940	325	1298	580
v/s Ratio Prot	c0.13	c0.16		0.05	0.22	c0.11	0.01	0.22	c0.14	0.22	
v/s Ratio Perm			0.01	0.14	0.22	0.08		0.08	c0.29		0.11
v/c Ratio	0.99	0.52	0.03	0.52	0.79	0.80	0.29	0.83	0.97	0.60	0.31
Uniform Delay, d1	52.0	34.2	29.1	26.5	40.4	30.7	29.5	41.4	32.8	31.1	27.5
Progression Factor	1.00	1.00	1.00	1.75	1.41	1.04	1.00	1.00	1.46	0.46	0.15
Incremental Delay, d2	40.3	0.8	0.1	1.2	5.0	6.8	0.7	8.4	35.8	1.6	1.1
Delay (s)	92.3	35.0	29.1	47.5	62.1	38.6	30.1	49.8	83.8	15.9	5.3
Level of Service	F	D	C	D	E	D	C	D	F	B	A
Approach Delay (s)	58.9			51.6			48.2			27.2	
Approach LOS	E			D			D			C	
Intersection Summary											
HCM 2000 Control Delay	45.2			HCM 2000 Level of Service			D				
HCM 2000 Volume to Capacity ratio	0.93										
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			22.0				
Intersection Capacity Utilization	87.7%			ICU Level of Service			E				
Analysis Period (min)	15										
c. Critical Lane Group											

Timings
5. St. Augustine Drive & Speers Road

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	WBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	75	790	1145	25	50	0
Future Volume (vph)	75	790	1145	25	50	0
Turn Type	Perm	NA	NA	Perm	Perm	NA
Protected Phases	4	8		8	6	
Permitted Phases	4	4	8	2	6	6
Detector Phase	4	4	8	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.9	23.9	23.9	24.3	24.3	24.3
Total Split (s)	93.0	93.0	93.0	27.0	27.0	27.0
Total Split (%)	77.5%	77.5%	77.5%	22.5%	22.5%	22.5%
Maximum Green (s)	87.1	87.1	87.1	20.7	20.7	20.7
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	2.2	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.9	5.9	6.3	6.3	6.3
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	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
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Min	C-Min	C-Min	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Intersection Summary						
Cycle Length: 120						
Actuated Cycle Length: 120						
Offset: 27 (23%), Referenced to phase 4:EBTL and 8:WBT, Start of Green						
Natural Cycle: 60						
Control Type: Actuated-Coordinated						



Queues
5. St. Augustine Drive & Speers Road

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	WBT	NBR	SBL	SBT
Lane Group Flow (vph)	78	849	1214	26	52	36
v/c Ratio	0.22	0.28	0.40	0.07	0.39	0.16
Control Delay	2.5	1.5	7.8	0.4	60.8	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.5	1.5	7.8	0.4	60.8	1.4
Queue Length 50th (m)	2.2	12.8	101.3	0.0	11.9	0.0
Queue Length 95th (m)	m3.2	m13.4	136.6	0.0	24.0	0.0
Internal Link Dist (m)		472.1	49.4			93.6
Turn Bay Length (m)						
Base Capacity (vph)	356	3032	3043	485	311	379
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 v/c Ratio	0.22	0.28	0.40	0.05	0.17	0.09
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

5. St. Augustine Drive & Speers Road

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	4	4	5	4	4	5	4	4	5	4	4
Traffic Volume (vph)	75	790	25	0	1145	20	0	0	25	50	0	35
Future Volume (vph)	75	790	25	0	1145	20	0	0	25	50	0	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1800	3551	1800	3563	1800	1644	1805	1615	1805	1615	1805	1615
Flt Permitted	0.22	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	416	3551	416	3563	416	1644	1805	1615	1805	1615	1805	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	78	823	26	0	1193	21	0	0	26	52	0	36
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	24	0	34	0
Lane Group Flow (vph)	78	848	0	0	1213	0	0	0	2	52	2	0
Conf. Ped. (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	NA	NA	NA	NA	NA	NA	Perm	Perm	NA	NA
Protected Phases	4											6
Permitted Phases	4								2	6		6
Actuated Green, G (s)	100.1	100.1			100.1				7.7	7.7		7.7
Effective Green, g (s)	100.1	100.1			100.1				7.7	7.7		7.7
Actuated G/C Ratio	0.83	0.83			0.83				0.06	0.06		0.06
Clearance Time (s)	5.9	5.9			5.9				6.3	6.3		6.3
Vehicle Extension (s)	3.0	3.0			3.0				3.0	3.0		3.0
Lane Grp Cap (vph)	347	2962			2972				105	115		103
v/s Ratio Prot	0.24				c0.34							0.00
v/s Ratio Perm	0.19								0.00	c0.03		0.00
v/c Ratio	0.22	0.29			0.41				0.02	0.45		0.02
Uniform Delay, d1	2.0	2.2			2.5				52.6	54.1		52.6
Progression Factor	0.55	0.56			2.77				1.00	1.00		1.00
Incremental Delay, d2	2.2	1.4			7.3				52.7	56.9		52.7
Level of Service	A	A			A				D	E		D
Approach Delay (s)	1.5				7.3				52.7			55.2
Approach LOS	A				A				D			E
Intersection Summary												
HCM 2000 Control Delay	7.3 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.41											
Actuated Cycle Length (s)	120.0											
Intersection Capacity Utilization	55.7%											
Analysis Period (min)	15											
c Critical Lane Group												

6. Speers Road/Cornwall Road & Cross Avenue

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR
Lane Configurations	5	2	2	5	2	2	5	2
Traffic Volume (vph)	265	745	1325	10	420	10	420	420
Future Volume (vph)	265	745	1325	10	420	10	420	420
Turn Type	pm-plt	NA	NA	NA	Prot	Perm	Perm	Perm
Protected Phases	5	2	2	6	4	4	4	4
Permitted Phases	5	2	2	6	4	4	4	4
Detector Phase	5	2	2	6	4	4	4	4
Switch Phase	6.0	38.0	38.0	10.0	10.0	10.0	10.0	10.0
Minimum Initial (s)	12.0	47.6	47.6	15.8	15.8	15.8	15.8	15.8
Minimum Split (s)	17.0	102.0	85.0	38.0	38.0	38.0	38.0	38.0
Total Split (%)	12.1%	72.9%	60.7%	27.1%	27.1%	27.1%	27.1%	27.1%
Maximum Green (s)	11.0	95.4	78.4	32.2	32.2	32.2	32.2	32.2
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8	5.8	5.8	5.8
Lead/Lag	Lead	Lag	Lag					
Lead-Lag Optimize?	Yes	Yes	Yes					
Vehicle Extension (s)	3.5	5.0	5.0	3.0	3.0	3.0	3.0	3.0
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	C-Min	C-Min	None	None	None	None	None
Walk Time (s)	10.0	10.0	10.0					
Flash Dont Walk (s)	31.0	31.0	31.0					
Pedestrian Calls (#/hr)	5	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								



Queues
6: Speers Road/Cornwall Road & Cross Avenue

Future Total PM (Phase 2)
Upper Kerr Village (8724-01)

	EBL	EBT	WBT	SBL	SBR
Lane Group	276	776	1396	10	438
Lane Group Flow (vph)	0.64	0.27	0.67	0.05	0.80
v/c Ratio	27.8	3.8	22.4	54.1	31.0
Control Delay	0.0	0.0	0.0	0.0	0.0
Queue Delay	27.8	3.8	22.4	54.1	31.0
Total Delay	33.4	21.8	128.8	2.6	21.9
Queue Length 50th (m)	70.2	37.3	166.8	7.8	40.7
Queue Length 95th (m)					
Internal Link Dist (m)	474.4	77.5	60.0		
Turn Bay Length (m)	80.0		45.0		
Base Capacity (vph)	432	2920	2073	415	856
Stavation 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	0.64	0.27	0.67	0.02	0.51
Intersection Summary					

HCM Signalized Intersection Capacity Analysis
6: Speers Road/Cornwall Road & Cross Avenue

Future Total PM (Phase 2)
Upper Kerr Village (8724-01)

	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↖	↖	↖	↖	↖
Traffic Volume (vph)	265	745	1325	15	420
Future Volume (vph)	265	745	1325	15	420
Ideal Flow (vphpb)	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
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00
Fibb. 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	0.10	1.00	1.00	0.95	1.00
Satd. Flow (perm)	188	3610	3567	1805	2733
Peak-Hour factor, PHF	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	276	776	1380	16	438
RTOR Reduction (vph)	0	0	0	0	266
Lane Group Flow (vph)	276	776	1396	0	172
Confl. Peds. (#/hr)	5		5		
Heavy Vehicles (%)	6%	0%	1%	0%	4%
Turn Type	pm>pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2			4	
Actuated Green, G (s)	113.2	113.2	81.4	14.4	14.4
Effective Green, g (s)	113.2	113.2	81.4	14.4	14.4
Actuated g/C Ratio	0.81	0.81	0.56	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)	481	2918	2073	185	281
v/s Ratio Prot	0.12	0.21	0.39	0.01	
v/s Ratio Perm	0.64	0.27	0.67	0.05	0.61
Uniform Delay, d1	27.1	3.3	20.2	56.7	60.1
Progression Factor	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.4	0.2	1.8	0.1	3.9
Delay (s)	30.5	3.5	21.9	56.8	64.1
Level of Service	C	A	C	E	E
Approach Delay (s)	10.6	21.9	63.9		
Approach LOS	B	C	E		
Intersection Summary					
HCM 2000 Control Delay			24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.66		
Actuated Cycle Length (s)			140.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization			75.5%	ICU Level of Service	D
Analysis Period (min)			15		
c Critical Lane Group					

7: Kerr Street & Prince Charles Drive

8: Kerr Street & Elmwood Road

Future Total PM (Phase 2)

Future Total PM (Phase 2)

Future Total PM (Phase 2)

Future Total PM (Phase 2)

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	525	10	20	655	25
Future Volume (Veh/h)	10	0	10	10	0	30	5	525	10	20	655	25
Sign Control	Stop	0%	Stop	0%	0%	Free	0%	0%	Free	0%	Free	0%
Grade	0%	0%	0%	0%	0%	0%	0%	0%	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	553	11	21	689	26
Pedestrians	20			30								5
Lane Width (m)	3.6			3.6								3.6
Walking Speed (m/s)	1.1			1.1								1.1
Percent Blockage	2			3								0
Right turn flare (veh)												
Median type							None					None
Median storage (veh)												
Upstream signal (m)								238				127
pX platoon unblocked	0.79	0.79	0.76	0.79	0.79	0.93	0.76					0.93
VC, conflicting volume	1370	1368	722	1354	1376	594	735					594
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	1146	1144	477	1126	1153	528	494					529
IC, single (s)	7.1	7.0	6.2	7.1	6.5	6.2	4.3					4.1
IC, 2 stage (s)												
p0 queue free %	3.5	4.5	3.3	3.5	4.0	3.3	2.4					2.2
IF (s)	91	100	98	92	100	94	99					98
CM capacity (veh/h)	122	120	442	131	146	500	734					929
Direction_Lane #	EB 1	WB 1	NB 1	SB 1			SB 1					
Volume Total	22	43	569	736								
Volume Left	11	11	5	21								
Volume Right	11	32	11	26								
cSH	191	290	734	929								
Volume to Capacity	0.11	0.15	0.01	0.02								
Queue Length 95th (m)	2.9	3.9	0.2	0.5								
Control Delay (s)	26.2	19.5	0.2	0.6								
Lane LOS	D	C	A	A								
Approach Delay (s)	26.2	19.5	0.2	0.6								
Approach LOS	D	C	A	A								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			60.4%								B	
Analysis Period (min)			15									

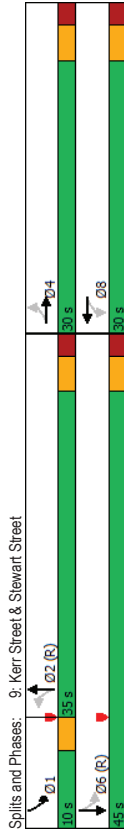
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	10	5	520	615	40
Future Volume (Veh/h)	15	10	5	520	615	40
Sign Control	Stop	Free	Free	0%	0%	0%
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	11	5	547	647	42
Pedestrians	36					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	3					
Right turn flare (veh)						
Median type			None	None	None	None
Median storage (veh)						
Upstream signal (m)				103	262	
pX platoon unblocked	0.85	0.80	0.80			
VC, conflicting volume	1260	703	724			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	964	504	530			
IC, single (s)	6.4	6.3	4.3			
IC, 2 stage (s)						
p0 queue free %	83	97	99			
CM capacity (veh/h)	237	428	737			
Direction_Lane #	EB 1	NB 1	SB 1			
Volume Total	27	552	689			
Volume Left	16	5	0			
Volume Right	11	0	42			
cSH	289	737	1700			
Volume to Capacity	0.09	0.01	0.41			
Queue Length 95th (m)	2.3	0.2	0.0			
Control Delay (s)	18.7	0.2	0.0			
Lane LOS	C	A	A			
Approach Delay (s)	18.7	0.2	0.0			
Approach LOS	C	A	A			
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			45.0%			A
Analysis Period (min)			15			

Timings
9: Kerr Street & Stewart Street

Future Total PM (Phase 2)
Upper Kerr Village (8724-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	50	10	10	15	10	400	55	505
Traffic Volume (vph)	50	10	10	15	10	400	55	505
Future Volume (vph)	Perm	NA	Perm	NA	Perm	NA	prn+pt	NA
Turn Type	4	8	8	2	2	1	6	6
Permitted Phases	4	8	8	2	2	1	6	6
Detector Phase	4	8	8	2	2	1	6	6
Switch Phase	10.0	10.0	10.0	10.0	24.0	6.0	24.0	24.0
Minimum Initial (s)	30.0	30.0	30.0	30.0	32.0	10.0	32.0	32.0
Minimum Split (s)	30.0	30.0	30.0	30.0	35.0	10.0	35.0	45.0
Total Split (s)	40.0%	40.0%	40.0%	40.0%	46.7%	13.3%	60.0%	60.0%
Total Split (%)	24.6	24.6	24.6	24.6	29.6	7.0	39.6	39.6
Maximum Green (s)	3.3	3.3	3.3	3.3	3.3	3.0	3.3	3.3
Yellow Time (s)	2.1	2.1	2.1	2.1	2.1	2.1	0.0	2.1
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Total Lost Time (s)	Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	3.0	4.0	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	C-Min	C-Min	None	C-Min	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:NBT and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated



Queues
9: Kerr Street & Stewart Street

Future Total PM (Phase 2)
Upper Kerr Village (8724-01)

	EBT	WBT	NBT	SBT
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	81	109	462	663
v/c Ratio	0.29	0.29	0.36	0.56
Control Delay	21.6	10.0	8.0	11.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.6	10.0	8.0	11.0
Queue Length 50th (m)	8.5	3.4	19.2	33.6
Queue Length 95th (m)	16.5	13.0	56.9	102.4
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)	444	552	1297	1192
Base Capacity (vph)	0	0	0	0
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	0.18	0.20	0.36	0.56

Intersection Summary

9: Kerr Street & Stewart Street

Future Total PM (Phase 2)

Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4
Traffic Volume (vph)	50	10	15	10	15	75	10	400	15	55	505	50
Future Volume (vph)	50	10	15	10	15	75	10	400	15	55	505	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	0.99			0.96			1.00			1.00		0.99
Fpb. ped/bikes	0.98			1.00			1.00			1.00		1.00
Ft	0.97			0.90			1.00			1.00		0.99
Flt Protected	0.97			0.99			1.00			1.00		1.00
Satd. Flow (prot)	1661			1562			1856			1802		1802
Flt Permitted	0.77			0.97			0.98			0.93		0.93
Satd. Flow (perm)	1323			1518			1830			1679		1679
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	549	54
RTOR Reduction (vph)	0	13	0	0	68	0	0	1	0	0	3	0
Lane Group Flow (vph)	68	0	0	41	0	0	461	0	0	660	0	0
Confl. Peds. (#/hr)	20	15	15	20	35	20	35	25	25	35	35	35
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Bus Blockages (#/hr)	0	2	0	0	2	0	0	0	0	0	3	0
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA	NA	pm-pt	NA	NA	NA
Protected Phases	4			8			2		1	6		6
Permitted Phases	4			8			2		1	6		6
Actuated Green, G (s)	13.2			13.2			51.0		51.0	51.0		51.0
Effective Green, g (s)	13.2			13.2			51.0		51.0	51.0		51.0
Actuated G/C Ratio	0.18			0.18			0.68		0.68	0.68		0.68
Clearance Time (s)	5.4			5.4			5.4		5.4	5.4		5.4
Vehicle Extension (s)	4.0			4.0			4.0		4.0	4.0		4.0
Lane Grp Cap. (vph)	232			267			1244		1141	1141		1141
v/s Ratio Prot												
v/s Ratio Perm	c0.05			0.03			0.25		c0.39	c0.39		c0.39
v/c Ratio	0.29			0.16			0.37		0.58	0.58		0.58
Uniform Delay, d1	26.8			26.2			5.1		6.3	6.3		6.3
Progression Factor	1.00			1.00			1.00		1.00	1.00		1.00
Incremental Delay, d2	1.0			0.4			0.8		0.7	0.7		0.7
Delay (s)	27.8			26.5			6.0		7.0	7.0		7.0
Level of Service	C			C			A		A	A		A
Approach Delay (s)	27.8			26.5			6.0		7.0	7.0		7.0
Approach LOS	C			C			A		A	A		A
Intersection Summary												
HCM 2000 Control Delay	9.6 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.54											
Actuated Cycle Length (s)	75.0 Sum of lost time (s)											
Intersection Capacity Utilization	81.3% ICU Level of Service											
Analysis Period (min)	15											
Critical Lane Group	c											

10: Donval Road & Wyecroft Road

Future Total PM (Phase 2)

Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	
Traffic Volume (vph)	385	220	60	95	490	95	1345	130	1180	130	1180	
Future Volume (vph)	385	220	60	95	490	95	1345	130	1180	130	1180	
Turn Type	Prot	NA	pm-pt	NA	pm+ov	pm-pt	NA	Prot	NA	Prot	NA	
Protected Phases	7	4	3	8	1	5	2	1	6			
Permitted Phases	7	4	3	8	1	5	2	1	6			
Switch Phase												
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	7.0	20.0	7.0	20.0	7.0	20.0	
Minimum Split (s)	12.0	25.0	12.0	25.0	12.0	12.0	41.0	12.0	41.0	12.0	41.0	
Total Split (s)	21.0	40.0	21.0	40.0	17.0	17.0	42.0	17.0	42.0	17.0	42.0	
Total Split (%)	17.5%	33.3%	17.5%	33.3%	14.2%	14.2%	35.0%	14.2%	35.0%	14.2%	35.0%	
Maximum Green (s)	16.0	33.0	16.0	33.0	12.0	12.0	35.0	12.0	35.0	12.0	35.0	
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	3.0	4.0	3.0	4.0	3.0	4.0	
All-Red Time (s)	2.0	3.0	2.0	3.0	2.0	2.0	3.0	2.0	3.0	2.0	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	
Total Lost Time (s)	5.0	7.0	5.0	7.0	5.0	5.0	7.0	5.0	7.0	5.0	7.0	
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Minimum Gap (s)	3.0	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	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	0.0	
Recall Mode	None	None	None	None	None	None	None	None	None	None	C-Min	
Walk Time (s)	7.0			7.0			7.0		7.0		7.0	
Flash Dont Walk (s)	11.0			11.0			27.0		27.0		27.0	
Pedestrian Calls (#/hr)	0			0			0		0		0	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 102 (86%), Referenced to phase 2:NETL and 6:SBT, Start of Green												
Natural Cycle: 90												
Control Type: Actuated-Coordinated												
Splits and Phases:	10: Donval Road & Wyecroft Road											

Queues
10: Dorval Road & Wynecroft Road

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group	418	418	65	103	533	103	1505	141	1511
Lane Group Flow (vph)	0.98	0.56	0.22	0.48	0.88	0.43	0.89	0.19	0.67
v/c Ratio	90.1	30.6	30.2	55.8	45.0	14.8	39.9	39.4	28.0
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	90.1	30.6	30.2	55.8	45.0	14.8	39.9	39.4	28.0
Queue Length 50th (m)	51.2	30.0	10.9	23.0	91.0	7.9	136.7	13.8	96.5
Queue Length 95th (m)	#82.7	45.1	19.8	38.3	129.7	m11.2	m#62.4	23.2	132.7
Internal Link Dist (m)	155.6		199.3			494.4		672.1	
Turn Bay Length (m)	115.0		145.0			65.0		125.0	
Base Capacity (vph)	428	1004	371	474	607	261	1690	730	2265
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.42	0.18	0.22	0.88	0.39	0.89	0.19	0.67

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
10: Dorval Road & Wynecroft Road

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	TT	TT	TT	T	T	T	TT	TT	TT	TT	TT	TT
Traffic Volume (vph)	385	220	165	60	95	490	95	1345	40	130	1180	210
Future Volume (vph)	385	220	165	60	95	490	95	1345	40	130	1180	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	5.0	5.0	7.0	5.0	5.0	7.0	5.0	7.0	5.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00	1.00	0.91	0.97	0.91	0.97	0.91
Fpb. ped/bikes	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	3213	3234	1783	1727	1590	1736	5041	3502	4973	3502	4973	1000
Flt Permitted	0.95	1.00	0.51	1.00	1.00	0.13	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (perm)	3213	3234	953	1727	1590	229	5041	3502	4973	3502	4973	1000
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)	418	239	179	65	103	533	103	1462	43	141	1283	228
RTOR Reduction (vph)	0	128	0	0	0	54	0	3	0	0	17	0
Lane Group Flow (vph)	418	290	0	65	103	479	103	1502	0	141	1494	0
Confl. Peds. (#/hr)	1	4	4	4	4	1	1	1	1	1	1	1
Heavy Vehicles (%)	9%	4%	2%	1%	10%	1%	4%	2%	2%	0%	1%	5%
Bus Blockages (#/hr)	0	2	0	0	0	0	0	3	0	0	0	0
Turn Type	Prot	NA	NA	pm-pt	NA	pm-ov	pm-pt	NA	Prot	NA	Prot	NA
Protected Phases	7	4		3	8	1	5	2		1		6
Permitted Phases				8		8		2				
Actuated Green, G (s)	16.0	22.8	24.8	15.8	40.8	50.1	39.2	25.0	33.2	25.0	53.3	53.3
Effective Green, g (s)	16.0	22.8	24.8	15.8	40.8	50.1	39.2	25.0	33.2	25.0	53.3	53.3
Actuated G/C Ratio	0.13	0.19	0.21	0.13	0.34	0.42	0.33	0.21	0.44	0.21	0.44	0.44
Clearance Time (s)	5.0	7.0	5.0	7.0	5.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	428	614	259	227	540	232	1646	729	2208	729	2208	2208
v/s Ratio Prot	c0.13	0.09	0.02	0.06	c0.18	0.04	c0.30	0.04	0.30	0.04	0.30	0.30
v/s Ratio Perm			0.03		0.12	0.14						
v/c Ratio	0.98	0.47	0.25	0.45	0.89	0.44	0.91	0.19	0.68	0.19	0.68	0.68
Uniform Delay, d1	51.8	43.2	39.2	48.1	37.4	22.1	38.8	39.2	26.5	39.2	26.5	26.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	0.78	0.91	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	37.4	1.2	1.1	3.0	17.1	1.4	5.1	0.3	1.7	0.3	1.7	1.7
Delay (s)	89.2	44.4	40.3	51.1	54.5	18.7	40.5	39.5	28.2	39.5	28.2	28.2
Level of Service	F	D	D	D	D	B	D	D	C	D	C	C
Approach Delay (s)		66.8		52.7		39.1			29.2			
Approach LOS		E		D		D			C			

Intersection Summary		
HCM 2000 Control Delay	42.5	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.91	D
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	83.9%	ICU Level of Service
Analysis Period (min)	15	E
c Critical Lane Group		

11: Speers Road & Interim Connection

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	0	865	1135	80	0	30
Future Volume (Veh/h)	0	865	1135	80	0	30
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	940	1234	87	0	33
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLT	TL	TWLT	TL		
Median storage (veh)	2	2				
Upstream signal (m)	73	162				
pX platoon unblocked	0.79		0.82	0.79		
vC, conflicting volume	1321		1748	660		
vC1, stage 1 conf vol			1278			
vC2, stage 2 conf vol			470			
vCu, unblocked vol	880		1191	46		
iC, single (s)	4.1		6.8	6.9		
iC, 2 stage (s)	2.2		5.8	3.3		
p0 queue free %	100		100	96		
p0 capacity (veh/h)	615		295	808		
Direction_Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1 SB 2
Volume Total	0	470	470	823	498	0 33
Volume Left	0	0	0	0	0	0 0
Volume Right	0	0	0	0	87	0 33
cSH	1700	1700	1700	1700	1700	808
Volume to Capacity	0.00	0.28	0.28	0.48	0.29	0.11 0.04
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0 1.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0 9.6
Lane LOS	A	A	A	A	A	A A
Approach Delay (s)	0.0		0.0		0.0	9.6
Approach LOS			A			A
Intersection Summary						
Average Delay	0.1					
Intersection Capacity Utilization	43.9%					
ICU Level of Service	A					
Analysis Period (min)	15					

14: Kerr Street & Rail Track

Future Total PM (Phase 2)
Upper Kerr Village (8/24-01)

Lane Group	NBT	SBT	Ø4
Lane Configurations	↔	↔	↔
Traffic Volume (vph)	690	625	
Future Volume (vph)	690	625	
Turn Type	NA	NA	
Protected Phases	2	6	4
Permitted Phases	2	6	
Detector Phase			
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	22.0	22.0	22.0
Total Split (s)	140.0	140.0	40.0
Total Split (%)	77.8%	77.8%	22%
Maximum Green (s)	138.0	138.0	38.0
Yellow Time (s)	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0
Total Lost Time (s)	2.0	2.0	
Lead/Lag			
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0
Recall Mode	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0
Intersection Summary			
Cycle Length	180		
Actuated Cycle Length	180		
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 50			
Control Type: Prelimed			
Splits and Phases: 14: Kerr Street & Rail Track			
Ø2 (R)	↔		
Ø4	↔		
Ø6 (R)	↔		
Ø4	↔		
Ø6 (R)	↔		
Ø4	↔		
Ø6 (R)	↔		

Queues
14.: Kerr Street & Rail Track

Future Total PM (Phase 2)
Upper Kerr Village (8724-01)

	NBT	SBT	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	719	651											
Lane Group Flow (vph)	0.50	0.45											
v/c Ratio	9.3	8.7											
Control Delay	52.8	0.0											
Queue Delay	62.1	8.7											
Total Delay	88.4	75.8											
Queue Length 50th (m)	111.6	95.9											
Queue Length 95th (m)	21.4	418.6											
Internal Link Dist (m)	1442	1442											
Turn Bay Length (m)	828	0											
Base Capacity (vph)	0	0											
Starvation Cap Reductn	0	0											
Spillback Cap Reductn	1.17	0.45											
Storage Cap Reductn													
Reduced v/c Ratio													
Intersection Summary													

HCM Signalized Intersection Capacity Analysis
14.: Kerr Street & Rail Track

Future Total PM (Phase 2)
Upper Kerr Village (8724-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	0	690	0	0	625	0
Future Volume (vph)	0	0	0	0	0	0	0	690	0	0	625	0
Ideal Flow (vphpb)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)								2.0				2.0
Lane Util. Factor								1.00				1.00
Flt Protected								1.00				1.00
Satd. Flow (prot)								1881				1881
Flt Permitted								1.00				1.00
Satd. Flow (perm)								1881				1881
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	0	0	0	0	719	0	0	651	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	719	0	0	651	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Turn Type								NA			NA	
Protected Phases		4						2			6	
Permitted Phases												
Actuated Green, G (s)								138.0			138.0	
Effective Green, g (s)								138.0			138.0	
Actuated g/C Ratio								0.77			0.77	
Clearance Time (s)								2.0			2.0	
Lane Grp Cap (vph)								1442			1442	
v/s Ratio Prot								d.38			0.35	
v/c Ratio								0.50			0.45	
Uniform Delay, d1								7.9			7.5	
Progression Factor								1.00			1.00	
Incremental Delay, d2								1.2			1.0	
Delay (s)								9.2			8.5	
Level of Service								A			A	
Approach Delay (s)		0.0		0.0				9.2			8.5	
Approach LOS		A		A				A			A	
Intersection Summary												
HCM 2000 Control Delay								8.9			HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio								0.39				
Actuated Cycle Length (s)								180.0			Sum of lost time (s)	4.0
Intersection Capacity Utilization								39.6%			ICU Level of Service	A
Analysis Period (min)								15				
c. Critical Lane Group												

1: Kerr Street & Wycroft Road

2: Kerr Street & Shepherd Road

Future Total AM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Future Total AM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	5	0	0	0	0	125
Traffic Volume (veh/h)	5	0	0	0	0	125
Future Volume (Veh/h)	5	0	0	0	0	125
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	5	0	0	0	0	133
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	66	66	133			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	66	66	133			
IC, single (s)	6.8	7.0	4.1			
IC, 2 stage (s)	3.5	3.3	2.2			
p0 queue free %	99	100	100			
CM capacity (veh/h)	937	980	1449			
Direction_Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	5	0	0	0	0	0 133
Volume Left	5	0	0	0	0	0
Volume Right	0	0	0	0	0	133
cSH	937	1700	1700	1700	1700	1700
Volume to Capacity	0.01	0.14	0.00	0.10	0.10	0.20
Queue Length 95th (m)	0.1	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	8.9	0.0	0.0	0.0	0.0	0.0
Lane LOS	A	A				
Approach Delay (s)	8.9	0.0				0.0
Approach LOS	A					
Intersection Summary						
Average Delay	0.3					
Intersection Capacity Utilization	14.1%					
Analysis Period (min)	15					
ICU Level of Service	A					



Lane Group	WBL	NBR	Ø1	Ø4	Ø6	Ø8
Lane Configurations	120	70				
Traffic Volume (vph)	120	70				
Future Volume (vph)	120	70				
Turn Type	pm+pt	Perm				
Protected Phases	3		1	4	6	8
Permitted Phases	8	2				
Detector Phase	3	2				
Switch Phase						
Minimum Initial (s)	5.0	18.0	7.0	5.0	18.0	5.0
Minimum Split (s)	9.0	28.2	11.0	22.0	28.2	22.0
Total Split (s)	20.0	42.0	15.0	31.0	57.0	51.0
Total Split (%)	18.5%	38.9%	14%	29%	53%	47%
Maximum Green (s)	16.0	36.8	11.0	27.0	51.8	47.0
Yellow Time (s)	3.0	3.3	4.0	3.0	3.3	3.0
All-Red Time (s)	1.0	1.9	0.0	1.0	1.9	1.0
Lost Time Adjust (s)	0.0	0.0				
Total Lost Time (s)	4.0	5.2				
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.5	2.5	3.0	3.5	3.0
Minimum Gap (s)	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
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	Min	None	Min	None	None
Walk Time (s)	10.0	10.0	7.0	10.0	7.0	10.0
Flash Dont Walk (s)	13.0	13.0	11.0	13.0	11.0	13.0
Pedestrian Calls (#/hr)	5		0	0	5	0
Intersection Summary						
Cycle Length	108					
Actuated Cycle Length	37.8					
Natural Cycle	75					
Control Type	Semi Ad-Uncooord					



Direction	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	5	0	0	0	0	0	133
Volume Left	5	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	133
cSH	937	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.01	0.14	0.00	0.10	0.10	0.20	0.08
Queue Length 95th (m)	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	8.9	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A	A					
Approach Delay (s)	8.9	0.0					0.0
Approach LOS	A						
Intersection Summary							
Average Delay	0.3						
Intersection Capacity Utilization	14.1%						
Analysis Period (min)	15						
ICU Level of Service	A						



Queues
2: Kerr Street & Shepherd Road

HCM Signalized Intersection Capacity Analysis
2: Kerr Street & Shepherd Road

Future Total AM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Future Total AM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

	WBL	NBR
Lane Group	132	77
Lane Group Flow (vph)	0.38	0.06
v/c Ratio	16.0	0.1
Control Delay	0.0	0.0
Queue Delay	16.0	0.1
Total Delay	16.0	0.1
Queue Length 50th (m)	6.4	0.0
Queue Length 95th (m)	18.2	0.0
Internal Link Dist (m)		
Turn Bay Length (m)	50.0	
Base Capacity (vph)	709	1473
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.19	0.05
Intersection Summary		

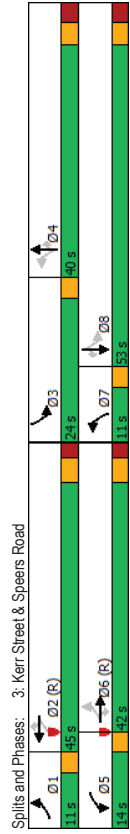
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	120	0	0	0	0	70	0	0	0
Future Volume (vph)	0	0	0	120	0	0	0	0	70	0	0	0
Ideal Flow (vphpb)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0											
Lane Util. Factor	1.00											
Fpb. ped/bikes	1.00											
Ft	1.00											
Ft Protected	0.95											
Satd. Flow (prot)	1671											
Ft Permitted	1.00											
Satd. Flow (perm)	1671											
Peak-Hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	132	0	0	0	0	77	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	32	0	0	0
Lane Group Flow (vph)	0	0	0	132	0	0	0	0	45	0	0	0
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	0%	0%	0%	8%	0%	0%	0%	2%	5%	1%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	2	0	0	6	0	0	0	0
Turn Type	Perm	pm-pt	pm-pt	Perm	Perm	pm-pt	Perm	pm-pt	Perm	pm-pt	Perm	Perm
Protected Phases	4	3	8	2	2	2	2	2	1	6	6	6
Permitted Phases	4	8	8	6.7	6.7	6.7	6.7	6.7	22.6	22.6	22.6	22.6
Actuated Green, G (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	22.6	22.6	22.6	22.6
Effective Green, g (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	22.6	22.6	22.6	22.6
Actuated G/C Ratio	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.59	0.59	0.59	0.59
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	5.2	5.2	5.2	5.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.5	3.5	3.5	3.5
Lane Grp Cap (vph)	290	290	290	290	290	290	290	290	881	881	881	881
v/s Ratio Prot	c0.08											
v/s Ratio Perm	c0.03											
v/c Ratio	0.46											
Uniform Delay, d1	14.3											
Progression Factor	1.00											
Incremental Delay, d2	1.1											
Delay (s)	15.4											
Level of Service	B											
Approach Delay (s)	0.0	15.4	15.4	3.4	3.4	3.4	3.4	3.4	0.0	0.0	0.0	0.0
Approach LOS	A	B	B	A	A	A	A	A	A	A	A	A
Intersection Summary												
HCM 2000 Control Delay	11.0											
HCM 2000 Volume to Capacity ratio	0.20											
Actuated Cycle Length (s)	38.5											
Intersection Capacity Utilization	36.9%											
Analysis Period (min)	15											
c Critical Lane Group												

Timings
3: Kerr Street & Speers Road

Future Total AM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	30	820	145	195	615	10	150	30	370	65	30	65
Traffic Volume (vph)	30	820	145	195	615	10	150	30	370	65	30	65
Future Volume (vph)	30	820	145	195	615	10	150	30	370	65	30	65
Turn Type	pm-pt	NA	Perm	pm-pt	NA	Perm	pm-pt	NA	Perm	pm-pt	NA	Perm
Protected Phases	1	6	6	2	2	2	4	4	4	8	8	8
Permitted Phases	1	6	6	2	2	2	4	4	4	3	3	8
Detector Phase												
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
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
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	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	14.0	14.0
Pedestrian Calls (#/hr)	15	15	15	15	15	15	15	35	35	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



Queues
3: Kerr Street & Speers Road

Future Total AM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	35	953	169	227	715	12	174	35	430	76	35	76
v/c Ratio	0.07	0.58	0.22	0.51	0.34	0.01	0.56	0.13	0.78	0.22	0.12	0.24
Control Delay	10.3	24.6	5.9	13.1	14.8	0.0	42.5	41.6	16.4	32.0	39.6	9.0
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	10.3	24.6	5.9	13.1	14.8	0.0	42.5	41.6	16.4	32.0	39.6	9.0
Queue Length 50th (m)	2.6	51.5	0.8	20.1	49.2	0.0	31.8	7.0	6.2	13.1	6.9	0.0
Queue Length 95th (m)	8.6	136.1	12.3	37.1	70.8	0.0	42.6	14.4	30.2	20.8	13.8	9.4
Internal Link Dist (m)		145.3		474.4			103.4				143.2	
Turn Bay Length (m)	105.0		75.0	75.0		100.0	50.0		45.0	80.0		75.0
Base Capacity (vph)	484	1633	775	443	2109	960	310	517	688	426	718	637
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	0.58	0.22	0.51	0.34	0.01	0.56	0.07	0.63	0.18	0.05	0.12
Intersection Summary												

3: Kerr Street & Speers Road HCM Signalized Intersection Capacity Analysis Future Total AM (Phase 2) Kerr St Closure Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	3	820	145	195	615	10	150	30	370	65	30	65
Traffic Volume (vph)	30	820	145	195	615	10	150	30	370	65	30	65
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpt)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	6.3
Total Lost time (s)	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	0.93	1.00	1.00	0.95
Fpb. 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
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1799	3378	1437	1687	3438	1495	1667	1844	1429	1648	1845	1511
Flt Permitted	0.38	1.00	1.00	1.00	1.00	1.00	0.68	1.00	0.73	1.00	1.00	1.00
Satd. Flow (perm)	719	3378	1437	341	3438	1495	1192	1844	1429	1274	1845	1511
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	35	953	169	227	715	12	174	35	430	76	35	76
RTOR Reduction (vph)	0	0	83	0	0	5	0	0	337	0	0	65
Lane Group Flow (vph)	35	953	86	227	715	7	174	35	93	76	35	11
Confl. Peds. (#/hr)	15	10	10	10	10	15	20	35	35	35	20	20
Heavy Vehicles (%)	0%	6%	7%	7%	5%	4%	6%	1%	5%	5%	3%	2%
Bus Blockages (#/hr)	0	4	0	0	0	0	0	5	0	0	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	2	7	4			3	8	
Permitted Phases	6	6	2	2	2	4	4	8	4	8	8	8
Actuated Green, G (s)	61.0	56.7	56.7	78.4	71.1	71.1	27.8	18.7	18.7	25.0	17.3	17.3
Effective Green, g (s)	61.0	56.7	56.7	78.4	71.1	71.1	27.8	18.7	18.7	25.0	17.3	17.3
Actuated G/C Ratio	0.51	0.47	0.47	0.65	0.59	0.59	0.23	0.16	0.16	0.21	0.14	0.14
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)	404	1596	678	432	2037	885	312	287	222	289	265	217
v/s Ratio Prot	0.00	c0.28	0.06	c0.08	0.21	0.00	c0.04	0.02	0.02	0.02	0.02	0.02
v/s Ratio Perm	0.04	0.26	0.26	0.00	c0.09	0.00	c0.09	0.07	0.04	0.04	0.04	0.01
v/s Ratio	0.09	0.60	0.13	0.53	0.35	0.01	0.56	0.12	0.42	0.26	0.13	0.05
Uniform Delay, d1	14.8	23.3	17.8	11.7	12.6	10.0	39.8	43.6	45.7	39.4	44.8	44.3
Progression Factor	0.97	0.90	1.05	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	1.6	0.4	0.9	0.5	0.0	1.7	0.3	1.7	0.4	0.3	0.1
Delay (s)	14.4	22.6	19.0	12.6	13.1	10.0	41.5	43.8	47.5	39.8	45.1	44.4
Level of Service	B	C	B	B	B	B	D	D	D	D	D	D
Approach Delay (s)	21.8			12.9			45.7			42.7		
Approach LOS	C			B			D			D		
Intersection Summary												
HCM 2000 Control Delay	25.4 HCM 2000 Level of Service C											
HCM 2000 Volume to Capacity ratio	0.68											
Actuated Cycle Length (s)	120.0 Sum of lost time (s) 18.2											
Intersection Capacity Utilization	68.0% ICU Level of Service C											
Analysis Period (min)	15											
Critical Lane Group	c											

4: Donval Road & Speers Road Future Total AM (Phase 2) Kerr St Closure Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	
Lane Configurations	425	605	40	80	400	440	70	875	385	575	270	
Traffic Volume (vph)	425	605	40	80	400	440	70	875	385	575	270	
Future Volume (vph)	425	605	40	80	400	440	70	875	385	575	270	
Turn Type	Prot	NA	Perm	pm-pt	NA	pm+ov	pm+pt	NA	pm+pt	NA	Perm	
Protected Phases	7	4		3	8	8	2	1	5	2	6	
Permitted Phases	7	4	4	4	3	8	1	5	2	1	6	
Detector Phase	7	4	4	4	3	8	1	5	2	1	6	
Switch Phase	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	7.0	20.0	20.0	
Minimum Initial (s)	11.0	42.0	42.0	11.0	42.0	11.0	11.0	40.0	11.0	40.0	40.0	
Minimum Split (s)	21.0	50.0	50.0	13.0	42.0	12.0	11.0	45.0	12.0	46.0	46.0	
Total Split (s)	17.5%	41.7%	41.7%	10.8%	35.0%	10.0%	9.2%	37.5%	10.0%	38.3%	38.3%	
Total Split (%)	17.5%	41.7%	41.7%	10.8%	35.0%	10.0%	9.2%	37.5%	10.0%	38.3%	38.3%	
Maximum Green (s)	17.0	43.0	43.0	9.0	35.0	8.0	7.0	38.0	8.0	39.0	39.0	
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	3.0	4.0	3.0	4.0	4.0	
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	1.0	1.0	3.0	1.0	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	
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0	
Minimum Gap (s)	3.0	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	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	0.0	
Recall Mode	None	None	None	None	None	None	None	C-Min	None	C-Min	C-Min	
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Flash Dont Walk (s)	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	
Pedestrian Calls (#/hr)	5	5	5	5	5	5	5	5	5	5	5	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 41 (34%), Referenced to phase 2: NBLT and 6: SBT, Start of Green												
Natural Cycle: 145												
Control Type: Actuated-Coordinated												
Splits and Phases: 4: Donval Road & Speers Road												

Queues
4: Dorval Road & Speers Road

Future Total AM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group	462	658	43	87	435	478	76	1087	418	625	293
Lane Group Flow (vph)	0.96	0.71	0.09	0.35	0.64	0.75	0.20	0.98	1.34	0.42	0.38
v/c Ratio	83.7	42.7	0.3	22.6	49.3	28.0	18.1	62.7	192.2	11.3	4.1
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	83.7	42.7	0.3	22.6	49.3	28.0	18.1	62.7	192.2	11.3	4.1
Total Delay	83.7	42.7	0.3	22.6	49.3	28.0	18.1	62.7	192.2	11.3	4.1
Queue Length 50th (m)	56.4	74.5	0.0	14.2	51.7	62.5	8.4	131.6	-104.4	46.9	14.2
Queue Length 95th (m)	#83.1	83.0	0.0	13.1	65.4	98.4	19.6	#177.2	#206.8	62.5	m26.5
Internal Link Dist (m)	412.3			472.1			621.6			494.4	
Turn Bay Length (m)	60.0		60.0	85.0		55.0	70.0		110.0		
Base Capacity (vph)	481	1192	600	254	949	639	379	1111	313	1489	766
Stavation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.55	0.07	0.34	0.46	0.75	0.20	0.98	1.34	0.42	0.38
Intersection Summary											
~ Volume exceeds capacity, queue is theoretically infinite.											
Queue shown is maximum after two cycles.											
# 95th percentile volume exceeds capacity, queue may be longer.											
Queue shown is maximum after two cycles.											
m Volume for 95th percentile queue is metered by upstream signal.											

HCM Signalized Intersection Capacity Analysis
4: Dorval Road & Speers Road

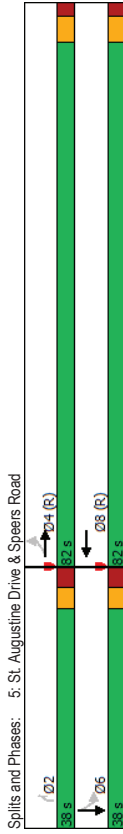
Future Total AM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT
Traffic Volume (vph)	425	605	40	80	400	440	70	875	125	385	575
Future Volume (vph)	425	605	40	80	400	440	70	875	125	385	575
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	0.98
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	1.00	1.00	0.85
Flt Flow (prot)	3400	3329	1482	1656	3256	1494	1786	3481	1687	3539	1417
Satd. Flow (perm)	3400	3329	1482	1656	3256	1494	1786	3481	1687	3539	1417
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
Adj. Flow (vph)	462	658	43	87	435	478	76	951	136	418	625
RTOR Reduction (vph)	0	0	31	0	0	70	0	10	0	0	172
Lane Group Flow (vph)	462	658	12	87	435	408	76	1077	0	418	625
Confl. Peds. (#/hr)	5			5		5		5		5	
Heavy Vehicles (%)	3%	8%	9%	9%	10%	7%	1%	2%	0%	7%	2%
Bus Blockages (#/hr)	0	2	0	0	4	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm-pt	NA	pm-pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6
Permitted Phases			4			8			2		6
Actuated Green, G (s)	17.0	33.6	33.6	33.6	25.1	43.0	44.2	38.0	59.9	49.7	49.7
Effective Green, g (s)	17.0	33.6	33.6	33.6	25.1	43.0	44.2	38.0	59.9	49.7	49.7
Actuated g/C Ratio	0.14	0.28	0.28	0.28	0.21	0.36	0.37	0.32	0.50	0.41	0.41
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	481	932	414	234	681	535	339	1102	310	1465	586
v/s Ratio Prot	c0.14	c0.20		0.03	0.13	0.11	0.01	0.31	c0.20	0.18	
v/s Ratio Perm			0.01	0.08	0.16	0.07			c0.47		0.09
v/c Ratio	0.96	0.71	0.03	0.37	0.64	0.76	0.22	0.98	1.35	0.43	0.21
Uniform Delay, d1	51.2	38.8	31.4	33.0	43.3	34.0	25.0	40.6	37.2	25.0	22.5
Progression Factor	1.00	1.00	1.00	0.88	1.06	0.91	1.00	1.00	0.84	0.40	0.94
Incremental Delay, d2	31.0	3.1	0.1	1.0	2.6	6.1	0.3	22.3	171.1	0.6	0.6
Delay (s)	82.2	41.8	31.4	30.0	48.5	36.9	25.3	62.8	202.2	10.7	21.7
Level of Service	F	D	C	C	D	D	C	E	F	B	C
Approach Delay (s)											
Approach LOS	E	E							E	E	
Intersection Summary											
HCM 2000 Control Delay	59.2										
HCM 2000 Volume to Capacity ratio	1.17										
Actuated Cycle Length (s)	120.0										
Sum of lost time (s)	22.0										
Intersection Capacity Utilization	93.8%										
ICU Level of Service	F										
Analysis Period (min)	15										
Critical Lane Group	c										

Timings
5. St. Augustine Drive & Speers Road

Future Total AM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	WBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	45	960	870	20	35	0
Future Volume (vph)	45	960	870	20	35	0
Turn Type	Perm	NA	NA	Perm	NA	NA
Protected Phases	4	8	8	6	6	6
Permitted Phases	4	4	8	2	6	6
Detector Phase	4	4	8	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.9	23.9	23.9	24.3	24.3	24.3
Total Split (s)	82.0	82.0	82.0	38.0	38.0	38.0
Total Split (%)	68.3%	68.3%	68.3%	31.7%	31.7%	31.7%
Maximum Green (s)	76.1	76.1	76.1	31.7	31.7	31.7
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	2.2	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.9	5.9	6.3	6.3	6.3
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	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
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Min	C-Min	C-Min	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0
Intersection Summary						
Cycle Length:	120					
Actuated Cycle Length:	120					
Offset:	51 (43%), Referenced to phase 4:EBTL and 8:WBT, Start of Green					
Natural Cycle:	55					
Control Type:	Actuated-Coordinated					



Queues
5. St. Augustine Drive & Speers Road

Future Total AM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	WBT	NBR	SBL	SBT
Lane Group Flow (vph)	51	1108	995	23	40	97
v/c Ratio	0.12	0.39	0.35	0.11	0.33	0.41
Control Delay	1.9	2.0	2.2	1.1	59.8	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.9	2.0	2.2	1.1	59.8	8.2
Queue Length 50th (m)	1.3	16.9	17.5	0.0	9.2	0.0
Queue Length 95th (m)	m1.9	m17.8	20.3	0.0	19.4	6.0
Internal Link Dist (m)	472.1	42.5				93.6
Turn Bay Length (m)	50.0					
Base Capacity (vph)	442	2851	2852	493	476	527
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 v/c Ratio	0.12	0.39	0.35	0.05	0.08	0.18
Intersection Summary						
m	Volume for 95th percentile queue is metered by upstream signal.					

5. St. Augustine Drive & Speers Road
 HCM Signalized Intersection Capacity Analysis
 Future Total AM (Phase 2) Kerr St Closure
 Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	5	5	5	5	5	5	5	5	5	5	5
Traffic Volume (vph)	45	960	15	0	870	5	0	0	20	35	0	85
Future Volume (vph)	45	960	15	0	870	5	0	0	20	35	0	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1798	3431	3434	3434	3434	3434	1565	1805	1615	1615	1615	1615
Flt Permitted	0.28	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	532	3431	3434	3434	3434	3434	1565	1805	1615	1615	1615	1615
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	51	1091	17	0	989	6	0	0	23	40	0	97
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	21	0	0	90
Lane Group Flow (vph)	51	1108	0	0	995	0	0	0	2	40	7	0
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	0%	5%	0%	0%	5%	5%	0%	0%	5%	0%	0%	0%
Turn Type	Perm	NA	NA	NA	NA	NA	NA	NA	Perm	Perm	NA	NA
Protected Phases	4											6
Permitted Phases	4								2	6		
Actuated Green, G (s)	99.7	99.7			99.7				8.1	8.1		8.1
Effective Green, g (s)	99.7	99.7			99.7				8.1	8.1		8.1
Actuated G/C Ratio	0.83	0.83			0.83				0.07	0.07		0.07
Clearance Time (s)	5.9	5.9			5.9				6.3	6.3		6.3
Vehicle Extension (s)	3.0	3.0			3.0				3.0	3.0		3.0
Lane Grp Cap (vph)	442	2850			2853				105	121		109
v/s Ratio Prot	c0.32				0.29							0.00
v/s Ratio Perm	0.10				0.00				0.00	c0.02		0.00
v/c Ratio	0.12	0.39			0.35				0.01	0.33		0.06
Uniform Delay, d1	1.9	2.5			2.4				52.2	53.4		52.4
Progression Factor	0.72	0.66			0.74				1.00	1.00		1.00
Incremental Delay, d2	0.2	0.2			0.3				0.1	1.6		0.2
Delay (s)	1.6	1.9			2.1				52.3	55.0		52.6
Level of Service	A	A			A				D	D		D
Approach Delay (s)	1.9	2.1			2.1				52.3	53.3		53.3
Approach LOS	A	A			A				D	D		D
Intersection Summary												
HCM 2000 Control Delay	5.5 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.38											
Actuated Cycle Length (s)	120.0 Sum of lost time (s)											
Intersection Capacity Utilization	50.8% ICU Level of Service											
Analysis Period (min)	15											
c Critical Lane Group												

6. Speers Road/Cornwall Road & Cross Avenue
 Future Total AM (Phase 2) Kerr St Closure
 Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	5	5	5	5	5	5	5	5	5	5	5
Traffic Volume (vph)	135	1125	545	135	1125	545	5	0	20	35	0	85
Future Volume (vph)	135	1125	545	135	1125	545	5	0	20	35	0	85
Turn Type	pm-pt	NA	NA	NA	NA	NA	Prot	Perm	Perm	Perm	Perm	Perm
Protected Phases	5	2	2	6	4							
Permitted Phases	2			2	6	4						
Detector Phase	5	2	2	6	4	4						
Switch Phase												
Minimum Initial (s)	6.0	38.0	38.0	10.0	10.0	10.0						
Minimum Split (s)	12.0	47.6	47.6	15.8	15.8	15.8						
Total Split (s)	35.0	109.0	74.0	31.0	31.0	31.0						
Total Split (%)	25.0%	77.9%	52.9%	22.1%	22.1%	22.1%						
Maximum Green (s)	29.0	102.4	67.4	25.2	25.2	25.2						
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3	3.3						
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5	2.5						
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0						
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8	5.8						
Lead/Lag	Lead	Lag	Lag									
Lead-Lag Optimize?	Yes	Yes	Yes									
Vehicle Extension (s)	3.5	5.0	5.0	3.0	3.0	3.0						
Minimum Gap (s)	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						
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0						
Recall Mode	None	C-Min	C-Min	None	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												



Queues
6: Speers Road/Cornwall Road & Cross Avenue

Future Total AM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

	EBL	EBT	WBT	SBL	SBR
Lane Group	159	1324	665	6	241
Lane Group Flow (vph)	0.26	0.46	0.26	0.05	0.58
v/c Ratio	3.0	3.5	6.4	60.8	13.1
Control Delay	0.0	0.0	0.0	0.0	0.0
Queue Delay	3.0	3.5	6.4	60.8	13.1
Total Delay	5.9	39.2	27.7	1.6	0.0
Queue Length 50th (m)	9.3	45.4	35.3	5.8	11.1
Queue Length 95th (m)	474.4	77.5	60.0		
Internal Link Dist (m)	80.0		45.0		
Turn Bay Length (m)	763	2909	2539	324	667
Base Capacity (vph)	0	0	0	0	0
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	0.21	0.46	0.26	0.02	0.36
Intersection Summary					

HCM Signalized Intersection Capacity Analysis
6: Speers Road/Cornwall Road & Cross Avenue

Future Total AM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔
Traffic Volume (vph)	135	1125	545	20	5
Future Volume (vph)	135	1125	545	20	5
Ideal Flow (vphpb)	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
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00
Fpb. 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)	1685	3471	3448	1805	2608
Flt Permitted	0.37	1.00	1.00	0.95	1.00
Satd. Flow (perm)	654	3471	3448	1805	2608
Peak-Hour factor, PHF	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	159	1324	641	24	6
RTOR Reduction (vph)	0	0	1	0	0
Lane Group Flow (vph)	159	1324	664	0	6
Confl. Peds. (#/hr)	5		5		
Heavy Vehicles (%)	7%	4%	4%	5%	9%
Turn Type	pm+pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2				4
Actuated Green, G (s)	117.3	117.3	103.0	10.3	10.3
Effective Green, g (s)	117.3	117.3	103.0	10.3	10.3
Actuated g/C Ratio	0.84	0.84	0.74	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)	609	2908	2536	132	191
v/s Ratio Prot	0.02	c0.38	0.19	0.00	
v/s Ratio Perm	0.20				c0.01
v/c Ratio	0.26	0.46	0.26	0.05	0.09
Uniform Delay, d1	2.4	3.0	6.1	60.3	60.5
Progression Factor	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.5	0.3	0.1	0.2
Delay (s)	2.6	3.5	6.3	60.4	60.7
Level of Service	A	A	A	E	E
Approach Delay (s)	3.4	6.3	60.7		
Approach LOS	A	A	E		
Intersection Summary					
HCM 2000 Control Delay	10.1		HCM 2000 Level of Service		
HCM 2000 Volume to Capacity ratio	0.45		B		
Actuated Cycle Length (s)	140.0		Sum of lost time (s)		
Intersection Capacity Utilization	65.3%		ICU Level of Service		
Analysis Period (min)	15		C		
c Critical Lane Group					

7: Kerr Street & Prince Charles Drive

8: Kerr Street & Elmwood Road

7: Kerr Street & Prince Charles Drive

8: Kerr Street & Elmwood Road

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4
Traffic Volume (veh/h)	5	0	5	5	0	40	5	510	5	40	315	5
Future Volume (Veh/h)	5	0	5	5	0	40	5	510	5	40	315	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	6	0	6	6	0	48	6	607	6	48	375	6
Pedestrians	15			30								
Lane Width (m)	3.6			3.6								
Walking Speed (m/s)	1.1			1.1								
Percent Blockage	1			3								
Right turn flare (veh)												
Median type							None	None	None	None	None	None
Median storage (veh)												
Upstream signal (m)							238					127
pX platoon unblocked	0.93	0.93	0.95	0.93	0.93	0.90	0.95			0.90		
VC, conflicting volume	1159	1144	383	1132	1144	640	386			643		
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	1003	987	331	974	987	544	334			547		
IC, single (s)	7.1	6.5	6.5	7.1	6.5	6.3	4.3			4.2		
IC, 2 stage (s)												
p0 queue free %	3.5	4.0	3.6	3.5	4.0	3.4	2.3			2.3		
IF (s)	96	100	99	97	100	90	99			95		
pM capacity (veh/h)	168	208	602	192	208	458	1075			873		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	12	54	619	429								
Volume Left	6	6	6	48								
Volume Right	6	48	6	6								
cSH	263	397	1075	873								
Volume to Capacity	0.05	0.14	0.01	0.05								
Queue Length 95th (m)	1.1	3.5	0.1	1.3								
Control Delay (s)	19.3	15.5	0.2	1.6								
Lane LOS	C	C	A	A								
Approach Delay (s)	19.3	15.5	0.2	1.6								
Approach LOS	C	C	C	C								
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			53.6%								A	
Analysis Period (min)			15									

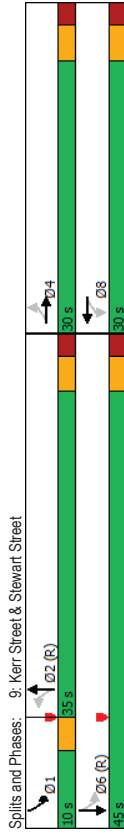
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W					
Traffic Volume (veh/h)	20	10	5	490	285	30
Future Volume (Veh/h)	20	10	5	490	285	30
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	24	12	6	576	335	35
Pedestrians	20			5		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.1			1.1		
Percent Blockage	2			0		
Right turn flare (veh)						
Median type				None	None	None
Median storage (veh)						
Upstream signal (m)				103	262	
pX platoon unblocked	0.87					
VC, conflicting volume	960	378	390			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	881	378	390			
IC, single (s)	6.4	6.2	4.1			
IC, 2 stage (s)						
p0 queue free %	3.5	3.3	2.2			
IF (s)	91	98	99			
pM capacity (veh/h)	272	658	1158			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	36	582	370			
Volume Left	24	6	0			
Volume Right	12	0	35			
cSH	338	1158	1700			
Volume to Capacity	0.11	0.01	0.22			
Queue Length 95th (m)	2.7	0.1	0.0			
Control Delay (s)	16.9	0.1	0.0			
Lane LOS	C	A	A			
Approach Delay (s)	16.9	0.1	0.0			
Approach LOS	C	C	C			
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			41.3%			A
Analysis Period (min)			15			

Timings
9: Kerr Street & Stewart Street

Future Total AM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	35	25	20	35	5	385	40	215
Traffic Volume (vph)	35	25	20	35	5	385	40	215
Future Volume (vph)	Perm	NA	Perm	NA	Perm	NA	prn+pt	NA
Turn Type	4		8		2		1	6
Protected Phases	4		8		2		1	6
Permitted Phases	4		8		2		1	6
Detector Phase	4		8		2		1	6
Switch Phase	4		8		2		1	6
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	0.0	0.0
Total Lost Time (s)	5.4		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:NBLT and 6:SBTL, Start of Green
Natural Cycle	75
Control Type	Actuated-Coordinated



Queues
9: Kerr Street & Stewart Street

Future Total AM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

	EBT	WBT	NBT	SBT
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	79	152	500	348
v/c Ratio	0.28	0.40	0.43	0.34
Control Delay	23.8	14.2	9.1	8.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.8	14.2	9.1	8.2
Queue Length 50th (m)	9.6	8.7	21.9	13.6
Queue Length 95th (m)	15.4	16.8	55.5	37.3
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)				
Base Capacity (vph)	459	559	1155	1013
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	0.17	0.27	0.43	0.34

Intersection Summary	
Cycle Length	75
Actuated Cycle Length	75
Offset	13 (17%), Referenced to phase 2:NBLT and 6:SBTL, Start of Green
Natural Cycle	75
Control Type	Actuated-Coordinated

9: Kerr Street & Stewart Street Future Total AM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	35	25	5	20	35	70	5	385	20	40	215	30
Traffic Volume (vph)	35	25	5	20	35	70	5	385	20	40	215	30
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Frt	0.97	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	1701	1612	1773	1717	1717	1717	1717	1717	1717	1717	1717	1717
Satd. Flow (prot)	0.79	0.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Permitted	1388	1532	1768	1544	1544	1544	1544	1544	1544	1544	1544	1544
Satd. Flow (perm)	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Peak-hour factor, PHF	43	30	6	24	43	85	6	470	24	49	262	37
Adj. Flow (vph)	0	5	0	0	68	0	0	1	0	0	4	0
RTOR Reduction (vph)	0	74	0	0	84	0	0	499	0	0	344	0
Lane Group Flow (vph)	20	20	20	20	20	30	35	35	35	35	30	30
Confl. Peds. (#/hr)	2%	7%	16%	0%	5%	4%	28%	6%	0%	2%	6%	6%
Heavy Vehicles (%)	0	2	0	0	2	0	0	0	0	0	0	4
Bus Blockages (#/hr)	Perm	NA	NA	Perm	NA	Perm	NA	pm-pt	NA	NA	NA	NA
Turn Type	4	8	2	8	2	2	1	6	6	6	6	6
Protected Phases	15.2	15.2	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0
Actuated Green, G (s)	0.20	0.20	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Effective Green, g (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Actuated G/C Ratio	281	310	1155	1008	1008	1008	1008	1008	1008	1008	1008	1008
Clearance Time (s)	0.05	0.26	0.27	0.43	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Vehicle Extension (s)	25.2	25.2	6.3	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Lane Grp Cap. (vph)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
v/s Ratio Prot	0.7	0.6	1.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
v/s Ratio Perm	25.9	25.9	7.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
v/c Ratio	C	C	A	A	A	A	A	A	A	A	A	A
Uniform Delay, d1	25.9	25.9	7.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Progression Factor	C	C	A	A	A	A	A	A	A	A	A	A
Incremental Delay, d2	25.9	25.9	7.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Delay (s)	C	C	A	A	A	A	A	A	A	A	A	A
Level of Service	C	C	A	A	A	A	A	A	A	A	A	A
Approach Delay (s)	C	C	A	A	A	A	A	A	A	A	A	A
Approach LOS	C	C	A	A	A	A	A	A	A	A	A	A
Intersection Summary	HCM 2000 Control Delay: 10.9 HCM 2000 Level of Service: B HCM 2000 Volume to Capacity ratio: 0.41 Actuated Cycle Length (s): 75.0 Sum of lost time (s): 13.8 Intersection Capacity Utilization: 62.7% ICU Level of Service: B Analysis Period (min): 15 Critical Lane Group:											

10: Dorval Road & Wyecroft Road Future Total AM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	17	4	3	8	2	2	1	6	6	6	6	6
Traffic Volume (vph)	215	70	20	65	115	1540	110	1195	110	1195	110	1195
Future Volume (vph)	215	70	20	65	115	1540	110	1195	110	1195	110	1195
Turn Type	Prot	NA	pm-pt	NA	pm-pt	NA	Prot	NA	Prot	NA	Prot	NA
Protected Phases	7	4	3	8	2	2	1	6	6	6	6	6
Detector Phase	7	4	3	8	2	2	1	6	6	6	6	6
Switch Phase	7.0	10.0	7.0	10.0	7.0	20.0	7.0	20.0	7.0	20.0	7.0	20.0
Minimum Initial (s)	12.0	25.0	12.0	25.0	12.0	41.0	12.0	41.0	12.0	41.0	12.0	41.0
Minimum Split (s)	21.0	40.0	21.0	40.0	17.0	42.0	17.0	42.0	17.0	42.0	17.0	42.0
Total Split (%)	17.5%	33.3%	17.5%	33.3%	14.2%	35.0%	14.2%	35.0%	14.2%	35.0%	14.2%	35.0%
Maximum Green (s)	16.0	33.0	16.0	33.0	12.0	35.0	12.0	35.0	12.0	35.0	12.0	35.0
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	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)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
Recall Mode	None	None	None	None	None	None	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	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	27.0	11.0	27.0	11.0	27.0	11.0	27.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Intersection Summary	Cycle Length: 120 Actuated Cycle Length: 120 Offset: 118 (98%), Referenced to phase 2:NETL and 6:SBT, Start of Green Natural Cycle: 90 Control Type: Actuated-Coordinated											
Splits and Phases:	10: Dorval Road & Wyecroft Road S1: 17 s, S2: 17 s, S3: 17 s, S4: 17 s, S5: 17 s, S6: 17 s, S7: 17 s, S8: 17 s, S9: 17 s, S10: 17 s, S11: 17 s, S12: 17 s P1: 42 s, P2: 42 s, P3: 42 s, P4: 42 s, P5: 42 s, P6: 42 s, P7: 42 s, P8: 42 s, P9: 42 s, P10: 42 s, P11: 42 s, P12: 42 s											

Queues
10: Dorval Road & Wynecroft Road

HCM Signalized Intersection Capacity Analysis
10: Dorval Road & Wynecroft Road

Future Total AM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Future Total AM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	234	190	22	174	125	1739	120	1777
Lane Group Flow (vph)	0.60	0.27	0.09	0.45	0.58	0.71	0.37	0.76
v/c Ratio	56.6	18.6	32.1	25.7	30.9	17.5	53.6	27.2
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	56.6	18.6	32.1	25.7	30.9	17.5	53.6	27.2
Total Delay	27.0	7.2	3.8	8.3	11.8	111.3	13.8	115.7
Queue Length 50th (m)	40.0	18.8	9.8	18.9	m12.9	m124.2	22.7	152.7
Queue Length 95th (m)	155.6	74.2	37.6	74.2	494.4	672.1	103.6	800.0
Internal Link Dist (m)	115.0		145.0		65.0	125.0		125.0
Turn Bay Length (m)	416	905	337	942	234	2460	357	2340
Base Capacity (vph)	0	0	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.21	0.07	0.18	0.53	0.71	0.34	0.76
Intersection Summary								
m Volume for 95th percentile queue is metered by upstream signal.								

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	TT	TT	T	T	TT	TT	TT	TT
Traffic Volume (vph)	215	70	105	20	65	95	115	1540
Future Volume (vph)	215	70	105	20	65	95	115	1540
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Lane Util. Factor	0.97	0.95	1.00	0.95	1.00	0.91	1.00	0.91
Fpb. ped/bikes	1.00	0.99	1.00	0.99	1.00	0.99	1.00	1.00
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.91	1.00	0.91	1.00	0.99	1.00	0.96
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3127	2992	1636	3157	1641	5038	3433	4700
Flt Permitted	0.95	1.00	0.63	1.00	0.07	1.00	0.95	1.00
Satd. Flow (perm)	3127	2992	1089	3157	124	5038	3433	4700
Peak-Hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	234	76	114	22	71	103	125	1674
RTOR Reduction (vph)	0	90	0	0	91	0	0	42
Lane Group Flow (vph)	234	100	0	22	83	0	125	1736
Confl. Peds. (#/hr)	2	3	3	3	2	1	1	1
Heavy Vehicles (%)	12%	7%	9%	10%	5%	2%	10%	2%
Bus Blockages (#/hr)	0	2	0	0	0	0	3	0
Turn Type	Prot	NA	NA	pm-pt	NA	pm-pt	NA	Prot
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases			8		2			
Actuated Green, G (s)	14.9	25.0	17.9	14.0	66.9	55.6	11.5	55.8
Effective Green, g (s)	14.9	25.0	17.9	14.0	66.9	55.6	11.5	55.8
Actuated g/C Ratio	0.12	0.21	0.15	0.12	0.56	0.46	0.10	0.46
Clearance Time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	388	623	180	368	211	2334	328	2185
v/s Ratio Prot	c0.07	0.03	0.00	c0.03	c0.06	0.34	0.03	c0.37
v/s Ratio Perm			0.01		0.27			
v/c Ratio	0.60	0.16	0.12	0.23	0.59	0.74	0.37	0.79
Uniform Delay, d1	49.8	38.9	44.0	48.1	19.7	26.4	50.8	27.2
Progression Factor	1.00	1.00	1.00	1.00	1.37	0.68	1.00	1.00
Incremental Delay, d2	3.9	0.3	0.6	0.7	2.6	0.9	1.4	3.1
Delay (s)	53.6	39.2	44.7	48.7	29.6	18.7	52.3	30.3
Level of Service	D	D	D	D	C	B	D	C
Approach Delay (s)	47.1	48.3	19.4	48.3	19.4	31.7	48.3	31.7
Approach LOS	D	D	B	D	B	C	D	C
Intersection Summary								
HCM 2000 Control Delay	28.7		HCM 2000 Level of Service		C			
HCM 2000 Volume to Capacity ratio	0.66							
Actuated Cycle Length (s)	120.0							
Sum of lost time (s)	24.0							
Intersection Capacity Utilization	74.2%		ICU Level of Service		D			
Analysis Period (min)	15							
c Critical Lane Group								

11: Speers Road & Interim Connection

14: Kerr Street & Rail Track

Future Total AM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Future Total AM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	0	1015	825	15	0	50
Future Volume (Veh/h)	0	1015	825	15	0	50
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1103	897	16	0	54
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWL	TL	TWL	TL		
Median storage (veh)	2	2				
Upstream signal (m)	66	169				
pX platoon unblocked	0.90		0.94	0.90		
vC, conflicting volume	913		1456	456		
vC1, stage 1 conf vol			905			
vC2, stage 2 conf vol			552			
vCv, unblocked vol	690		988	185		
IC, single (s)	4.1		6.8	6.9		
IC, 2 stage (s)	2.2		5.8			
p0 queue free %	100		100	93		
IF (s)	826		390	752		
Direction_Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1 SB 2
Volume Total	0	552	552	598	315	0 54
Volume Left	0	0	0	0	0	0 0
Volume Right	0	0	0	0	16	0 54
cSH	1700	1700	1700	1700	1700	752
Volume to Capacity	0.00	0.32	0.32	0.35	0.19	0.11 0.07
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0 1.8
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0 10.2
Lane LOS						A B
Approach Delay (s)	0.0		0.0		10.2	
Approach LOS					B	
Intersection Summary						
Average Delay	0.3					
Intersection Capacity Utilization	33.3%					
ICU Level of Service	A					
Analysis Period (min)	15					

Lane Group	Ø2	Ø4	Ø6
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Turn Type			
Protected Phases	2	4	6
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	22.0	22.0	22.0
Total Split (s)	140.0	40.0	140.0
Total Split (%)	78%	22%	78%
Maximum Green (s)	138.0	38.0	138.0
Yellow Time (s)	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0
Recall Mode	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0
Intersection Summary			
Cycle Length: 180			
Actuated Cycle Length: 180			
Offset: 0 (0%), Referenced to phase 2/NBT and 6/SBT, Start of Green			
Natural Cycle: 45			
Control Type: Prelimed			
Splits and Phases: 14: Kerr Street & Rail Track			
Ø2 (R)	138.0		
Ø4 (R)		40.0	
Ø6 (R)			138.0

Queues
14.: Kerr Street & Rail Track

HCM Signalized Intersection Capacity Analysis
14.: Kerr Street & Rail Track

Future Total AM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Future Total AM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Lane Group	
Lane Group Flow (vph)	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)											
Lane Util. Factor											
Flt Protected											
Satd. Flow (prot)											
Flt Permitted											
Satd. Flow (perm)											
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
Adj. Flow (vph)	0	0	0	0	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	3%
Turn Type											
Protected Phases		4					2				6
Permitted Phases											
Actuated Green, G (s)											
Effective Green, g (s)											
Actuated g/C Ratio											
Clearance Time (s)											
Lane Grp Cap (vph)											
v/s Ratio Prot											
v/c Ratio											
Uniform Delay, d1											
Progression Factor											
Incremental Delay, d2											
Delay (s)											
Level of Service											
Approach Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Approach LOS	A	A	A	A	A	A	A	A	A	A	A
Intersection Summary											
HCM 2000 Control Delay			0.0								A
HCM 2000 Volume to Capacity ratio			0.00								
Actuated Cycle Length (s)			180.0							4.0	
Intersection Capacity Utilization			0.0%							ICU Level of Service	A
Analysis Period (min)			15								
c Critical Lane Group											

1: Kerr Street & Wycroft Road

2: Kerr Street & Shepherd Road

Future Total PM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Future Total PM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	25	0	0	0	0	115
Future Volume (Veh/h)	25	0	0	0	0	115
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	27	0	0	0	0	124
Pedestrians	5					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	0					
Right turn flare (veh)				None	None	
Median type						
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked	67	67	129			
VC, conflicting volume						
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	67	67	129			
IC, single (s)	6.8	7.0	4.2			
IC, 2 stage (s)						
p0 queue free %	3.5	3.3	2.3			
IF (s)	97	100	100			
CM capacity (veh/h)	932	972	1419			
Direction_Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	27	0	0	0	0	0 124
Volume Left	27	0	0	0	0	0 0
Volume Right	0	0	0	0	0	0 124
cSH	932	1700	1700	1700	1700	1700
Volume to Capacity	0.03	0.23	0.00	0.19	0.19	0.22 0.07
Queue Length 95th (m)	0.7	0.0	0.0	0.0	0.0	0.0 0.0
Control Delay (s)	9.0	0.0	0.0	0.0	0.0	0.0 0.0
Lane LOS	A	A	A	A	A	A A
Approach Delay (s)	9.0	0.0	0.0	0.0	0.0	0.0
Approach LOS	A	A	A	A	A	A
Intersection Summary						
Average Delay	1.6					
Intersection Capacity Utilization	15.7%					
ICU Level of Service	A					
Analysis Period (min)	15					

Lane Group	WBL	NBR	Ø1	Ø4	Ø6
Lane Configurations	↔	↔	↔	↔	↔
Traffic Volume (vph)	105	110			
Future Volume (vph)	105	110			
Turn Type	Perm	Perm			
Protected Phases			1	4	6
Permitted Phases	8	2			
Detector Phase	8	2			
Switch Phase					
Minimum Initial (s)	5.0	18.0	7.0	5.0	18.0
Minimum Split (s)	22.0	28.2	11.0	22.0	28.2
Total Split (s)	33.0	53.0	22.0	33.0	75.0
Total Split (%)	30.6%	49.1%	20%	31%	69%
Maximum Green (s)	29.0	47.8	18.0	29.0	69.8
Yellow Time (s)	3.0	3.3	4.0	3.0	3.3
All-Red Time (s)	1.0	1.9	0.0	1.0	1.9
Lost Time Adjust (s)	0.0	0.0			
Total Lost Time (s)	4.0	5.2			
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?	Yes	Yes			
Vehicle Extension (s)	3.0	3.5	2.5	3.0	3.5
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	Min	None	Min	Min
Walk Time (s)	7.0	10.0	7.0	10.0	13.0
Flash Dont Walk (s)	11.0	13.0			
Pedestrian Calls (#/hr)	0	5			
Intersection Summary					
Cycle Length: 108					
Actuated Cycle Length: 39.8					
Natural Cycle: 65					
Control Type: Semi Ad-Uncoord					
Splits and Phases: 2: Kerr Street & Shepherd Road					
	Ø1	Ø2	Ø3	Ø4	Ø6
	23.6	53.5	33.8	53.5	23.6

Queues
2: Kerr Street & Shepherd Road

Future Total PM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

	WBL	NBR
Lane Group	108	113
Lane Group Flow (vph)	0.38	0.08
v/c Ratio	17.2	0.1
Control Delay	0.0	0.0
Queue Delay	17.2	0.1
Total Delay	17.2	0.1
Queue Length 50th (m)	5.5	0.0
Queue Length 95th (m)	16.0	0.0
Internal Link Dist (m)		
Turn Bay Length (m)	50.0	
Base Capacity (vph)	980	1533
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.11	0.07

HCM Signalized Intersection Capacity Analysis
2: Kerr Street & Shepherd Road

Future Total PM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	105	0	0	0	0	110	0	0	0
Future Volume (vph)	0	0	0	105	0	0	0	0	110	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0											
Lane Util. Factor	1.00											
Fpb. ped/bikes	1.00											
Fpb. ped/bikes	0.98											
Frt	1.00											
Frt	0.95											
Satd. Flow (prot)	1723											
Frt Permitted	0.76											
Satd. Flow (perm)	1373											
Peak-Hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	0	0	108	0	0	0	0	113	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	46	0	0	0
Lane Group Flow (vph)	0	0	0	108	0	0	0	0	67	0	0	0
Confl. Peds. (#/hr)	5	15	15	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	0%	0%	0%	3%	0%	1%	0%	1%	2%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	3	0	0	5	0	0	0	0
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	pm-pt	Perm	Perm	Perm
Protected Phases	4		8		8		2		2	1		6
Permitted Phases	4		8		8		2		2	6		6
Actuated Green, G (s)	7.2		7.2		7.2		24.2		24.2			24.2
Effective Green, g (s)	7.2		7.2		7.2		24.2		24.2			24.2
Actuated G/C Ratio	0.18		0.18		0.18		0.60		0.60			0.60
Clearance Time (s)	4.0		4.0		4.0		5.2		5.2			5.2
Vehicle Extension (s)	3.0		3.0		3.0		3.5		3.5			3.5
Lane Grp Cap (vph)	243		243		243		920		920			920
v/s Ratio Prot												
v/s Ratio Perm	c0.08		c0.08		c0.08		c0.04		c0.04			c0.04
v/c Ratio	0.44		0.44		0.44		0.07		0.07			0.07
Uniform Delay, d1	14.9		14.9		14.9		3.5		3.5			3.5
Progression Factor	1.00		1.00		1.00		1.00		1.00			1.00
Incremental Delay, d2	1.3		1.3		1.3		0.0		0.0			0.0
Delay (s)	16.2		16.2		16.2		3.5		3.5			3.5
Level of Service	B		B		B		A		A			A
Approach Delay (s)	0.0		0.0		0.0		16.2		3.5			0.0
Approach LOS	A		A		B		A		A			A
Intersection Summary												
HCM 2000 Control Delay	9.7											
HCM 2000 Volume to Capacity ratio	0.18											
Actuated Cycle Length (s)	40.6											
Sum of lost time (s)	13.2											
Intersection Capacity Utilization	36.2%											
ICU Level of Service	A											
Analysis Period (min)	15											
Critical Lane Group	c											

Timings
3: Kerr Street & Speers Road

Future Total PM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Queues
3: Kerr Street & Speers Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR	Ø3
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	
Traffic Volume (vph)	30	670	185	300	1040	120	250	5	235	110	25	
Future Volume (vph)	30	670	185	300	1040	120	250	5	235	110	25	
Turn Type	pm-pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	NA	Perm	
Protected Phases	1	6	6	2	2	2	4	4	4	8	8	3
Permitted Phases	1	6	6	2	2	2	7	7	7	4	4	8
Detector Phase												
Switch Phase												
Minimum Initial (s)	7.0	25.0	25.0	7.0	25.0	25.0	7.0	10.0	10.0	10.0	10.0	7.0
Minimum Split (s)	10.0	30.9	30.9	10.0	30.9	30.9	10.0	34.3	34.3	34.3	34.3	10.0
Total Split (s)	12.0	54.0	54.0	12.0	54.0	54.0	16.0	38.0	38.0	38.0	38.0	16.0
Total Split (%)	10.0%	45.0%	45.0%	10.0%	45.0%	45.0%	13.3%	31.7%	31.7%	31.7%	31.7%	13.3%
Maximum Green (s)	9.0	48.1	48.1	9.0	48.1	48.1	13.0	31.7	31.7	31.7	31.7	13.0
Yellow Time (s)	3.0	3.7	3.7	3.0	3.7	3.7	3.0	3.3	3.3	3.3	3.3	3.0
All-Red Time (s)	0.0	2.2	2.2	0.0	2.2	2.2	0.0	3.0	3.0	3.0	3.0	0.0
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	6.3	6.3	3.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lead	Lead
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	4.0	4.0	2.5
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
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	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	14.0	14.0
Pedestrian Calls (#/hr)	15	15	15	15	15	15	15	35	35	35	35	15

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



Future Total PM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Queues
3: Kerr Street & Speers Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	32	705	195	316	1095	126	283	5	247	116	26
v/c Ratio	0.10	0.46	0.24	0.63	0.55	0.14	0.64	0.01	0.41	0.43	0.09
Control Delay	7.0	23.4	7.8	16.4	19.7	3.0	40.3	28.8	5.9	51.0	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	23.4	7.8	16.4	19.7	3.0	40.3	28.8	5.9	51.0	0.6
Queue Length 50th (m)	2.9	58.2	10.3	34.1	36.4	0.0	47.0	0.8	0.0	24.3	0.0
Queue Length 95th (m)	6.5	98.0	21.5	48.2	114.8	9.2	72.1	3.8	18.0	41.9	0.0
Internal Link Dist (m)	138.4			474.4			103.4			143.2	
Turn Bay Length (m)	105.0		75.0	75.0		100.0	50.0		45.0	75.0	
Base Capacity (vph)	335	1548	797	504	1973	883	413	568	615	501	456
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.46	0.24	0.63	0.55	0.14	0.64	0.01	0.40	0.23	0.06

Intersection Summary

3: Kerr Street & Speers Road
 HCM Signalized Intersection Capacity Analysis
 Future Total PM (Phase 2) Kerr St Closure
 Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	30	670	185	300	1040	120	250	5	235	0	110	25
Traffic Volume (vph)	30	670	185	300	1040	120	250	5	235	0	110	25
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	6.3	6.3	6.3
Total Lost time (s)	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	0.97	1.00	1.00	0.94	1.00	1.00	0.93	1.00	0.93	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00
Frb. ped/bikes	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1802	3511	1560	1751	3539	1485	1743	1877	1486	1900	1501	1501
Flt Permitted	0.23	1.00	1.00	0.28	1.00	1.00	0.55	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	430	3511	1560	523	3539	1485	1013	1877	1486	1900	1501	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)	32	705	195	316	1095	126	263	5	247	0	116	26
RTOR Reduction (vph)	0	0	109	0	0	57	0	0	175	0	0	22
Lane Group Flow (vph)	32	705	86	316	1095	69	263	5	72	0	116	4
Confl. Peds. (#/hr)	30	5	5	5	30	35	35	35	35	35	35	35
Heavy Vehicles (%)	0%	2%	0%	3%	2%	2%	1%	0%	1%	0%	0%	0%
Bus Blockages (#/hr)	0	4	0	0	0	0	0	0	3	0	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	2	7	4					
Permitted Phases	6	6	2	2	2	4	4	8	8	8	8	8
Actuated Green, G (s)	57.1	52.9	52.9	72.9	65.7	65.7	34.9	34.9	34.9	16.9	16.9	16.9
Effective Green, g (s)	57.1	52.9	52.9	72.9	65.7	65.7	34.9	34.9	34.9	16.9	16.9	16.9
Actuated G/C Ratio	0.48	0.44	0.44	0.61	0.55	0.55	0.29	0.29	0.29	0.14	0.14	0.14
Clearance Time (s)	3.0	5.9	5.9	3.0	5.9	5.9	3.0	6.3	6.3	6.3	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	4.0	4.0	4.0
Lane Grp Cap. (vph)	252	1547	687	491	1937	813	385	545	432	267	211	211
v/s Ratio Prot	0.00	0.20	0.06	c0.30	0.05	c0.11	0.00	0.05	0.05	0.06	0.06	0.06
v/s Ratio Perm	0.13	0.46	0.13	0.64	0.57	0.08	0.68	0.01	0.17	0.43	0.02	0.02
Uniform Delay, d1	17.0	23.5	19.9	12.9	17.8	12.9	35.6	30.3	31.7	47.2	44.4	44.4
Progression Factor	0.62	0.90	2.20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.9	0.4	2.6	1.2	0.2	4.5	0.0	0.2	1.5	0.0	0.0
Delay (s)	10.7	22.2	44.0	15.4	19.0	13.1	40.2	30.3	32.0	48.7	44.4	44.4
Level of Service	B	C	D	B	B	B	D	D	C	C	D	D
Approach Delay (s)	26.3	26.3	17.8	17.8	17.8	36.1	36.1	36.1	36.1	47.9	47.9	47.9
Approach LOS	C	C	B	B	B	D	D	D	D	D	D	D
Intersection Summary												
HCM 2000 Control Delay	24.7 HCM 2000 Level of Service C											
HCM 2000 Volume to Capacity ratio	0.69											
Actuated Cycle Length (s)	120.0 Sum of lost time (s)											
Intersection Capacity Utilization	71.5% ICU Level of Service C											
Analysis Period (min)	15											
Critical Lane Group	c											

4: Dorval Road & Speers Road
 Future Total PM (Phase 2) Kerr St Closure
 Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	435	500	50	170	695	710	65	665	425	750	390	390
Traffic Volume (vph)	435	500	50	170	695	710	65	665	425	750	390	390
Future Volume (vph)	435	500	50	170	695	710	65	665	425	750	390	390
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm+pt	NA	pm+pt	NA	Perm	Perm
Protected Phases	7	4	3	8	1	5	2	1	6			
Permitted Phases	7	4	4	3	8	1	5	2	1	6	6	6
Detector Phase	7	4	4	3	8	1	5	2	1	6	6	6
Switch Phase	7.0	10.0	10.0	7.0	10.0	7.0	7.0	20.0	7.0	20.0	20.0	20.0
Minimum Initial (s)	11.0	42.0	42.0	11.0	42.0	11.0	11.0	40.0	11.0	40.0	40.0	40.0
Minimum Split (s)	19.0	44.0	44.0	17.0	42.0	19.0	11.0	40.0	19.0	48.0	48.0	48.0
Total Split (s)	15.8%	36.7%	36.7%	14.2%	35.0%	15.8%	9.2%	33.3%	15.8%	40.0%	40.0%	40.0%
Total Split (%)	15.0	37.0	37.0	13.0	35.0	15.0	7.0	33.0	15.0	41.0	41.0	41.0
Maximum Green (s)	3.0	4.0	4.0	3.0	4.0	3.0	3.0	4.0	3.0	4.0	4.0	4.0
Yellow Time (s)	1.0	3.0	3.0	1.0	3.0	1.0	1.0	3.0	1.0	3.0	3.0	3.0
All-Red Time (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
Lost Time Adjust (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0	7.0
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	4.0	7.0	4.0	7.0	7.0	7.0
Lead/Lag	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (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
Time Before Reduce (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
Time To Reduce (s)	None	None	None	None	None	None	None	None	None	None	None	None
Recall Mode	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Walk Time (s)	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0
Flash Dont Walk (s)	5	5	5	5	5	5	5	5	5	5	5	5
Pedestrian Calls (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 17 (14%), Referenced to phase 2:NBLT and 6:SBTL, Start of Green												
Natural Cycle: 135												
Control Type: Actuated-Coordinated												



Queues
4: Dorval Road & Speers Road

Future Total PM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group	473	543	54	185	755	772	71	799	462	815	424
Lane Group Flow (vph)	1.05	0.50	0.09	0.48	0.79	1.04	0.26	0.84	1.38	0.61	0.52
v/c Ratio	105.2	36.2	0.3	29.1	53.4	76.0	21.4	50.0	218.2	17.5	3.4
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	105.2	36.2	0.3	29.1	53.4	76.0	21.4	50.0	218.2	17.5	3.4
Total Delay	-65.2	55.1	0.0	35.1	90.4	-126.6	9.1	91.9	-127.2	70.6	12.1
Queue Length 50th (m)	#97.8	71.6	0.0	38.3	84.3	#204.2	17.7	115.6	#194.7	45.6	3.5
Queue Length 95th (m)	412.3			472.1			621.6			494.4	
Internal Link Dist (m)	60.0			85.0			70.0			110.0	
Turn Bay Length (m)	452	1097	580	405	1034	739	269	975	334	1333	818
Base Capacity (vph)	0	0	0	0	0	0	0	0	0	0	0
Stavation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.05	0.49	0.09	0.46	0.73	1.04	0.26	0.82	1.38	0.61	0.52

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis
4: Dorval Road & Speers Road

Future Total PM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Traffic Volume (vph)	435	500	50	170	695	710	65	665	70	425	750
Future Volume (vph)	435	500	50	170	695	710	65	665	70	425	750
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Fpb. ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00
Fibb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	1.00	1.00	0.85
Satd. Flow (prot)	3433	3560	1556	1786	3546	1581	1805	3523	1787	3574	1599
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3560	1556	1718	3546	1581	553	3523	226	3574	1599
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
Adj. Flow (vph)	473	543	54	185	755	772	71	723	76	462	815
RTOR Reduction (vph)	0	0	38	0	0	43	0	7	0	0	224
Lane Group Flow (vph)	473	543	16	185	755	729	71	792	0	462	815
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	2%	1%	2%	1%	1%	1%	0%	1%	1%	1%	1%
Bus Blockages (#/hr)	0	2	0	0	4	0	0	0	0	0	0
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm-pt	NA	pm-pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2	1	6	
Permitted Phases			4	8	8	8	2		6		6
Actuated Green, G (s)	15.8	36.4	36.4	44.4	32.5	50.0	37.9	32.2	53.7	44.0	44.0
Effective Green, g (s)	15.8	36.4	36.4	44.4	32.5	50.0	37.9	32.2	53.7	44.0	44.0
Actuated g/C Ratio	0.13	0.30	0.30	0.37	0.27	0.42	0.32	0.27	0.45	0.37	0.37
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0
Lane Grp Cap (vph)	462	1079	471	371	960	658	234	945	328	1310	586
v/s Ratio Prot	c0.14	c0.15		0.05	0.21	c0.16	0.01	0.22	c0.20	0.23	
v/s Ratio Perm			0.01	0.13	0.30	0.08			c0.42		0.12
v/c Ratio	1.05	0.50	0.03	0.50	0.79	1.11	0.30	0.84	1.41	0.62	0.34
Uniform Delay, d1	52.1	34.4	29.4	26.7	40.5	35.0	29.4	41.4	34.3	31.2	27.5
Progression Factor	1.00	1.00	1.00	1.28	1.17	1.12	1.00	1.00	1.26	0.90	0.26
Incremental Delay, d2	55.0	0.8	0.1	1.0	4.8	68.0	0.7	8.8	197.6	1.8	1.2
Delay (s)	107.1	35.1	29.5	35.1	52.1	107.3	30.1	50.3	241.0	17.3	8.4
Level of Service	F	D	C	D	D	F	C	D	F	B	A
Approach Delay (s)											
Approach LOS											
Intersection Summary											
HCM 2000 Control Delay											
HCM 2000 Volume to Capacity ratio											
Actuated Cycle Length (s)											
Intersection Capacity Utilization											
Analysis Period (min)											
c Critical Lane Group											

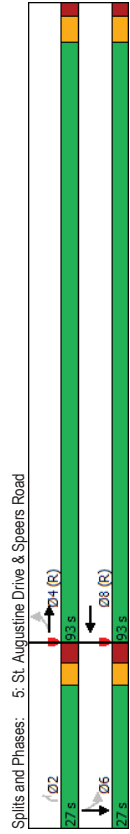
Without Kerr St Improvements
BA Group - EFS
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Timings
5. St. Augustine Drive & Speers Road

Future Total PM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	WBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	115	855	1295	25	25	0
Future Volume (vph)	115	855	1295	25	25	0
Turn Type	Perm	NA	NA	Perm	Perm	NA
Protected Phases	4	4	8	2	6	6
Permitted Phases	4	4	8	2	6	6
Detector Phase						
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	23.9	23.9	24.3	24.3	24.3	24.3
Total Split (s)	93.0	93.0	93.0	27.0	27.0	27.0
Total Split (%)	77.5%	77.5%	77.5%	22.5%	22.5%	22.5%
Maximum Green (s)	87.1	87.1	87.1	20.7	20.7	20.7
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	2.2	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.9	5.9	5.9	6.3	6.3	6.3
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	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
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Min	C-Min	None	None	None	None
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0

Intersection Summary	
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	27 (23%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated



Queues
5. St. Augustine Drive & Speers Road

Lane Group	EBL	EBT	WBT	NBR	SBL	SBT
Lane Group Flow (vph)	120	917	1385	26	26	57
v/c Ratio	0.39	0.30	0.44	0.09	0.24	0.31
Control Delay	4.1	1.1	6.5	0.6	58.4	7.8
Queue Delay	0.0	0.0	0.2	0.0	0.0	0.0
Total Delay	4.1	1.1	6.8	0.6	58.4	7.8
Queue Length 50th (m)	2.5	9.4	117.3	0.0	6.0	0.0
Queue Length 95th (m)	m1.7	m3.4	67.7	0.0	14.9	4.9
Internal Link Dist (m)		472.1	49.4			93.6
Turn Bay Length (m)						
Base Capacity (vph)	306	3081	3092	461	311	353
Starvation Cap Reductn	0	0	819	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.30	0.60	0.06	0.08	0.16

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

5. St. Augustine Drive & Speers Road
 HCM Signalized Intersection Capacity Analysis
 Future Total PM (Phase 2) Kerr St Closure
 Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	5	5	5	5	5	5	5	5	5	5	5
Traffic Volume (vph)	115	855	25	0	1295	15	0	0	25	25	0	55
Future Volume (vph)	115	855	25	0	1295	15	0	0	25	25	0	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1801	3552	3567	3567	3567	1644	1805	1615	1644	1805	1615	1615
Flt Permitted	0.19	1.00	1.00	1.00	1.00	0.05	1.00	0.05	1.00	0.05	1.00	1.00
Satd. Flow (perm)	353	3552	3567	3567	3567	1644	1805	1615	1644	1805	1615	1615
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	120	891	26	0	1349	16	0	0	26	26	0	57
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	25	0	54	0
Lane Group Flow (vph)	120	916	0	0	1365	0	0	0	1	26	3	0
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	0%	1%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	NA	NA	NA	NA	NA	NA	Perm	Perm	NA	NA
Protected Phases	4											6
Permitted Phases	4								2	6		6
Actuated Green, G (s)	101.6	101.6			101.6				6.2	6.2		6.2
Effective Green, g (s)	101.6	101.6			101.6				6.2	6.2		6.2
Actuated G/C Ratio	0.85	0.85			0.85				0.05	0.05		0.05
Clearance Time (s)	1.7	5.9	5.9	5.9	5.9	5.9	5.9	5.9	6.3	6.3	6.3	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	298	3007			3020				84	83		83
v/s Ratio Prot	0.26				c0.38							0.00
v/s Ratio Perm	0.34								0.00	c0.01		0.00
v/c Ratio	0.40	0.30			0.45				0.02	0.28		0.04
Uniform Delay, d1	2.1	1.9			2.3				54.0	54.8		54.1
Progression Factor	0.86	0.50			2.58				1.00	1.00		1.00
Incremental Delay, d2	3.6	1.1			6.3				54.1	56.4		54.2
Level of Service	A	A			A				D	E		D
Approach Delay (s)	1.4				6.3				54.1			54.9
Approach LOS	A				A				D			D
Intersection Summary												
HCM 2000 Control Delay	6.4 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.44											
Actuated Cycle Length (s)	120.0 Sum of lost time (s)											
Intersection Capacity Utilization	61.9% ICU Level of Service											
Analysis Period (min)	15											
c Critical Lane Group												

6. Speers Road/Cornwall Road & Cross Avenue
 Future Total PM (Phase 2) Kerr St Closure
 Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	5	5	5	5	5	5	5	5	5	5	5	5
Traffic Volume (vph)	195	620	1165	10	325							
Future Volume (vph)	195	620	1165	10	325							
Turn Type	pm-pt	NA	NA	Prot	Perm							
Protected Phases	5	2	6	4								
Permitted Phases	5	2	6	4								
Detector Phase	5	2	6	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	Lag									
Lead-Lag Optimize?	Yes	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	6: Speers Road/Cornwall Road & Cross Avenue											
Diagram												

Queues
 6: Speers Road/Cornwall Road & Cross Avenue
 Future Total PM (Phase 2) Kerr St Closure
 Upper Kerr Village (8/24-01)

	EBL	EBT	WBT	SBL	SBR
Lane Group	203	646	1230	10	339
Lane Group Flow (vph)	0.55	0.21	0.48	0.07	0.67
v/c Ratio	7.8	2.5	9.4	60.7	14.3
Control Delay	0.0	0.0	0.0	0.0	0.0
Queue Delay	7.8	2.5	9.4	60.7	14.3
Total Delay	7.7	14.3	66.1	2.7	1.9
Queue Length 50th (m)	14.0	21.3	99.9	8.3	17.8
Queue Length 95th (m)	474.4	77.5	60.0		
Internal Link Dist (m)	80.0		45.0		
Turn Bay Length (m)	389	3016	2569	415	879
Base Capacity (vph)	0	0	0	0	0
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	0.52	0.21	0.48	0.02	0.39
Intersection Summary					

HCM Signalized Intersection Capacity Analysis
 6: Speers Road/Cornwall Road & Cross Avenue
 Future Total PM (Phase 2) Kerr St Closure
 Upper Kerr Village (8/24-01)

	EBL	EBT	WBT	SBL	SBR
Movement	EBL	EBT	WBT	SBL	SBR
Lane Configurations	195	620	1165	15	10
Traffic Volume (vph)	195	620	1165	15	10
Future Volume (vph)	1900	1900	1900	1900	1900
Ideal Flow (vphpb)	6.0	6.6	6.6	5.8	5.8
Total Lost time (s)	1.00	0.95	0.95	1.00	0.88
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00
Fibb. ped/bikes	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)	327	3610	3566	1805	2733
Peak-Hour factor, PHF	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	203	646	1214	16	10
RTOR Reduction (vph)	0	0	0	0	0
Lane Group Flow (vph)	203	646	1230	0	38
Confl. Peds. (#/hr)	5	5	5	5	5
Heavy Vehicles (%)	6%	0%	1%	0%	4%
Turn Type	pm+pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
Permitted Phases	2				4
Actuated Green, G (s)	117.0	117.0	100.9	10.6	10.6
Effective Green, g (s)	117.0	117.0	100.9	10.6	10.6
Actuated g/C Ratio	0.84	0.84	0.72	0.08	0.08
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)	372	3016	2570	136	206
v/s Ratio Prot	c0.04	0.18	0.34	0.01	
v/c Ratio Perm	c0.42				c0.01
v/c Ratio	0.55	0.21	0.48	0.07	0.18
Uniform Delay, d1	5.4	2.3	8.3	60.1	60.6
Progression Factor	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	0.2	0.6	0.2	0.4
Delay (s)	7.2	2.5	9.0	60.4	61.1
Level of Service	A	A	A	E	E
Approach Delay (s)	3.6	9.0	61.1		
Approach LOS	A	A	E		
Intersection Summary					
HCM 2000 Control Delay			14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.53		
Actuated Cycle Length (s)			140.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization			68.6%	ICU Level of Service	C
Analysis Period (min)			15		
c Critical Lane Group					

7: Kerr Street & Prince Charles Drive

8: Kerr Street & Elmwood Road

7: Kerr Street & Prince Charles Drive

8: Kerr Street & Elmwood 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	470	10	20	560	25
Future Volume (Veh/h)	10	0	10	10	0	30	5	470	10	20	560	25
Sign Control	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%	0%	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	495	11	21	589	26
Pedestrians	20			30								5
Lane Width (m)	3.6			3.6								3.6
Walking Speed (m/s)	1.1			1.1								1.1
Percent Blockage	2			3								0
Right turn flare (veh)												
Median type												
Median storage (veh)												
Upstream signal (m)								238				127
pX platoon unblocked	0.87	0.87	0.85	0.87	0.87	0.96	0.96	0.85		0.96		0.86
VC, conflicting volume	1212	1210	622	1196	1218	536	635			536		
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	1077	1075	471	1058	1084	500	466			500		
IC, single (s)	7.1	7.0	6.2	7.1	6.5	6.2	4.3			4.1		
IC, 2 stage (s)												
p0 queue free %	3.5	4.5	3.3	3.5	4.0	3.3	2.4			2.2		
IF (s)	93	100	98	93	100	94	99			98		
p0 capacity (veh/h)	150	146	500	160	177	537	829			984		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	22	43	511	636								
Volume Left	11	11	5	21								
Volume Right	11	32	11	26								
cSH	231	335	829	984								
Volume to Capacity	0.10	0.13	0.01	0.02								
Queue Length 95th (m)	2.4	3.3	0.1	0.5								
Control Delay (s)	22.2	17.3	0.2	0.6								
Lane LOS	C	C	A	A								
Approach Delay (s)	22.2	17.3	0.2	0.6								
Approach LOS	C	C	A	A								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			55.1%								B	
Analysis Period (min)			15									

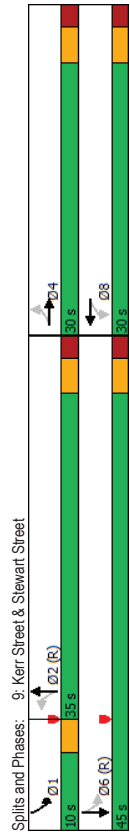
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	10	5	465	520	40
Future Volume (Veh/h)	15	10	5	465	520	40
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	11	5	489	547	42
Pedestrians	36					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.1					
Percent Blockage	3					
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (m)				103	262	
pX platoon unblocked	0.95	0.92	0.92			
VC, conflicting volume	1102	603	624			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	899	520	543			
IC, single (s)	6.4	6.3	4.3			
IC, 2 stage (s)						
p0 queue free %	94	98	99			
IF (s)	3.5	3.4	2.4			
p0 capacity (veh/h)	286	479	834			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	27	494	589			
Volume Left	16	5	0			
Volume Right	11	0	42			
cSH	342	834	1700			
Volume to Capacity	0.08	0.01	0.35			
Queue Length 95th (m)	1.9	0.1	0.0			
Control Delay (s)	16.4	0.2	0.0			
Lane LOS	C	A	A			
Approach Delay (s)	16.4	0.2	0.0			
Approach LOS	C	A	A			
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			40.0%			A
Analysis Period (min)			15			

Timings
9: Kerr Street & Stewart Street

Future Total PM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	4	4	8	8	2	2	1	6
Traffic Volume (vph)	50	10	10	15	10	345	55	410
Future Volume (vph)	50	10	10	15	10	345	55	410
Turn Type	Perm	NA	Perm	NA	Perm	NA	prn+pt	NA
Protected Phases	4	4	8	8	2	2	1	6
Permitted Phases	4	4	8	8	2	2	1	6
Detector Phase	4	4	8	8	2	2	1	6
Switch Phase	4	4	8	8	2	2	1	6
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	0.0	0.0
Total Lost Time (s)	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Lead/Lag	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	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:NBT and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated



Queues
9: Kerr Street & Stewart Street

	EBT	WBT	NBT	SBT
Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	81	109	402	560
v/c Ratio	0.29	0.29	0.31	0.47
Control Delay	21.6	10.0	7.5	9.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.6	10.0	7.5	9.5
Queue Length 50th (m)	8.5	3.4	16.0	25.7
Queue Length 95th (m)	16.5	13.0	48.1	78.1
Internal Link Dist (m)	71.6	36.6	141.0	79.0
Turn Bay Length (m)	444	552	1295	1185
Base Capacity (vph)	0	0	0	0
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	0.18	0.20	0.31	0.47

Intersection Summary

9: Kerr Street & Stewart Street Future Total PM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4
Traffic Volume (vph)	50	10	15	10	15	75	10	345	15	55	410	50
Future Volume (vph)	50	10	15	10	15	75	10	345	15	55	410	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	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
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
Fpb. ped/bikes	0.99	0.96	0.96	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ft	0.97	0.90	0.90	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Flt Protected	0.97	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1661	1562	1562	1852	1852	1795	1795	1795	1795	1795	1795	1795
Flt Permitted	0.77	0.97	0.97	0.99	0.99	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Satd. Flow (perm)	1323	1518	1518	1827	1827	1667	1667	1667	1667	1667	1667	1667
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	375	16	60	446	54
RTOR Reduction (vph)	0	13	0	0	68	0	0	1	0	0	4	0
Lane Group Flow (vph)	0	68	0	0	41	0	0	401	0	0	556	0
Confl. Peds. (#/hr)	20	15	15	20	35	20	35	25	25	25	35	35
Heavy Vehicles (%)	2%	20%	0%	0%	13%	2%	0%	1%	17%	1%	2%	0%
Bus Blockages (#/hr)	0	2	0	0	2	0	0	0	0	0	3	0
Turn Type	Perm	NA	NA	Perm	NA	Perm	NA	pm-pt	NA	pm-pt	NA	NA
Protected Phases	4	4	4	8	8	2	2	1	1	6	6	6
Permitted Phases	4	4	4	8	8	2	2	1	1	6	6	6
Actuated Green, G (s)	13.2	13.2	13.2	13.2	13.2	51.0	51.0	51.0	51.0	51.0	51.0	51.0
Effective Green, g (s)	13.2	13.2	13.2	13.2	13.2	51.0	51.0	51.0	51.0	51.0	51.0	51.0
Actuated G/C Ratio	0.18	0.18	0.18	0.18	0.18	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Clearance Time (s)	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap. (vph)	232	267	267	267	267	1242	1242	1133	1133	1133	1133	1133
v/s Ratio Prot	c0.05	0.03	0.03	0.03	0.03	0.22	0.22	c0.33	c0.33	c0.33	c0.33	c0.33
v/s Ratio Perm	0.29	0.16	0.16	0.16	0.16	0.32	0.32	0.49	0.49	0.49	0.49	0.49
v/c Ratio	26.8	26.2	26.2	26.2	26.2	4.9	4.9	5.8	5.8	5.8	5.8	5.8
Uniform Delay, d1	1.0	1.0	1.0	1.0	1.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	1.0	1.0	1.0	1.0	1.0	0.4	0.7	0.3	0.3	0.3	0.3	0.3
Incremental Delay, d2	27.8	26.5	26.5	26.5	26.5	5.6	5.6	6.1	6.1	6.1	6.1	6.1
Level of Service	C	C	C	C	C	A	A	A	A	A	A	A
Approach Delay (s)	27.8	26.5	26.5	26.5	26.5	5.6	5.6	6.1	6.1	6.1	6.1	6.1
Approach LOS	C	C	C	C	C	A	A	A	A	A	A	A
Intersection Summary												
HCM 2000 Control Delay	9.4 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.47											
Actuated Cycle Length (s)	75.0 Sum of lost time (s)											
Intersection Capacity Utilization	75.2% ICU Level of Service											
Analysis Period (min)	15											
Critical Lane Group	c											

10: Donval Road & Wyecroft Road Future Total PM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4
Traffic Volume (vph)	385	150	65	55	405	100	1580	60	1355	60	1355	60
Future Volume (vph)	385	150	65	55	405	100	1580	60	1355	60	1355	60
Turn Type	Prot	NA	pm-pt	NA	pm+ov	pm-pt	NA	Prot	NA	Prot	NA	6
Protected Phases	7	4	3	8	8	2	2	1	1	6	6	6
Detector Phase	7	4	3	8	8	1	5	2	1	6	6	6
Switch Phase	7	4	3	8	8	1	5	2	1	6	6	6
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	7.0	20.0	7.0	20.0	7.0	20.0	20.0
Minimum Split (s)	12.0	25.0	12.0	25.0	12.0	12.0	41.0	12.0	41.0	12.0	41.0	41.0
Total Split (s)	21.0	40.0	21.0	40.0	17.0	17.0	42.0	17.0	42.0	17.0	42.0	42.0
Total Split (%)	17.5%	33.3%	17.5%	33.3%	14.2%	14.2%	35.0%	14.2%	35.0%	14.2%	35.0%	35.0%
Maximum Green (s)	16.0	33.0	16.0	33.0	12.0	12.0	35.0	12.0	35.0	12.0	35.0	35.0
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	3.0	4.0	3.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	3.0	2.0	3.0	2.0	2.0	3.0	2.0	3.0	2.0	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)	5.0	7.0	5.0	7.0	5.0	5.0	7.0	5.0	7.0	5.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Gap (s)	3.0	3.0	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	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	0.0	0.0
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	C-Min
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	27.0	11.0	27.0	11.0	27.0	27.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 103 (86%), Referenced to phase 2:NETL and 6:SBT, Start of Green												
Natural Cycle: 90												
Control Type: Actuated-Coordinated												
Splits and Phases:	10: Donval Road & Wyecroft Road											
Ø1	17 s											
Ø2 (R)	42 s											
Ø3	21 s											
Ø4	40 s											
Ø5	17 s											
Ø6 (R)	42 s											
Ø7	21 s											
Ø8	40 s											

Queues
10: Dorval Road & Wynecroft Road

HCM Signalized Intersection Capacity Analysis
10: Dorval Road & Wynecroft Road

Future Total PM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Future Total PM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	418	353	71	60	440	109	1760	65
Lane Group Flow (vph)	0.98	0.58	0.27	0.34	0.82	0.48	0.89	0.09
v/c Ratio	90.1	25.8	33.8	54.1	42.3	19.4	35.5	39.0
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	90.1	25.8	33.8	54.1	42.3	19.4	35.5	39.0
Total Delay	51.2	18.6	12.4	13.5	73.7	7.2	148.4	6.5
Queue Length 50th (m)	#82.7	32.8	22.0	25.5	98.0	m9.6	#84.3	12.2
Queue Length 95th (m)	155.6	145.0	199.3	494.4	672.1			
Internal Link Dist (m)	115.0				65.0		125.0	
Turn Bay Length (m)	428	1011	340	474	535	253	1977	698
Base Capacity (vph)	0	0	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.35	0.21	0.13	0.82	0.43	0.89	0.09

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	TT	TT	TT	TT	TT	TT	TT	TT
Traffic Volume (vph)	385	150	175	65	55	405	100	1580
Future Volume (vph)	385	150	175	65	55	405	100	1580
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Lane Util. Factor	0.97	0.95	1.00	1.00	1.00	1.00	0.91	0.97
Fpb. ped/bikes	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95
Satd. Flow (prot)	3213	3177	1783	1727	1592	1736	5045	3502
Flt Permitted	0.95	1.00	0.54	1.00	1.00	0.09	1.00	0.95
Satd. Flow (perm)	3213	3177	1014	1727	1592	173	5045	3502
Peak-Hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	418	163	190	71	60	440	109	1717
RTOR Reduction (vph)	0	163	0	0	0	58	0	2
Lane Group Flow (vph)	418	190	0	71	60	382	109	1758
Confl. Peds. (#/hr)	1	4	4	4	1	1	1	1
Heavy Vehicles (%)	9%	4%	2%	1%	10%	1%	4%	2%
Bus Blockages (#/hr)	0	2	0	0	0	0	3	0
Turn Type	Prot	NA	NA	pm-pt	NA	pm-ov	pm-pt	NA
Protected Phases	7	4	3	8	1	5	2	1
Permitted Phases	8	8	8	8	2	8	2	6
Actuated Green, G (s)	16.0	17.1	19.9	10.5	34.4	56.5	45.6	23.9
Effective Green, g (s)	16.0	17.1	19.9	10.5	34.4	56.5	45.6	23.9
Actuated g/C Ratio	0.13	0.14	0.17	0.09	0.29	0.47	0.38	0.20
Clearance Time (s)	5.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	428	452	228	151	456	223	1917	697
v/s Ratio Prot	c0.13	0.06	0.02	0.03	c0.17	0.04	c0.35	0.02
v/s Ratio Perm	0.03	0.07	0.07	0.18	0.07	0.18	0.07	0.34
v/c Ratio	0.98	0.42	0.31	0.40	0.84	0.49	0.92	0.09
Uniform Delay, d1	51.8	46.9	43.5	51.8	40.2	19.1	35.4	39.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	0.93	0.93	1.00
Incremental Delay, d2	37.4	1.3	1.6	3.6	13.9	1.1	2.9	0.1
Delay (s)	89.2	48.3	45.1	55.3	54.0	18.9	35.7	39.3
Level of Service	F	D	D	E	D	B	D	D
Approach Delay (s)	F	D	D	E	D	B	D	D
Approach LOS	E	E	E	D	D	C	C	C

Intersection Summary
HCM 2000 Control Delay 39.2 HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio 0.90
Actuated Cycle Length (s) 120.0 Sum of lost time (s) 24.0
Intersection Capacity Utilization 81.8% ICU Level of Service D
Analysis Period (min) 15
c Critical Lane Group

11: Speers Road & Interim Connection

14: Kerr Street & Rail Track

Future Total PM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Future Total PM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	0	905	1275	40	0	35
Future Volume (Veh/h)	0	905	1275	40	0	35
Sign Control	Free	Free	Free	Stop	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	984	1386	43	0	38
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWL	TL	TWL	TL		
Median storage (veh)	2	2				
Upstream signal (m)	73	162				
pX platoon unblocked	0.79		0.82	0.79		
VC conflicting volume	1429		1900	714		
VC1, stage 1 conf vol			1408			
VC2, stage 2 conf vol			492			
VCu, unblocked vol	1018		1369	116		
IC, single (s)	4.1		6.8	6.9		
IC, 2 stage (s)	2.2		5.8			
p0 queue free %	100		100	95		
ICF (s)	547		244	730		
Direction_Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1 SB 2
Volume Total	0	492	492	924	505	0 38
Volume Left	0	0	0	0	0	0 0
Volume Right	0	0	0	0	43	0 38
cSH	1700	1700	1700	1700	1700	730
Volume to Capacity	0.00	0.29	0.29	0.54	0.30	0.11 0.05
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0 1.3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0 10.2
Lane LOS						A B
Approach Delay (s)	0.0		0.0		10.2	
Approach LOS					B	
Intersection Summary						
Average Delay	0.2					
Intersection Capacity Utilization	46.5%					
ICU Level of Service	A					
Analysis Period (min)	15					

Lane Group	Ø2	Ø4	Ø6
Lane Configurations			
Traffic Volume (vph)			
Future Volume (vph)			
Turn Type			
Protected Phases	2	4	6
Permitted Phases			
Detector Phase			
Switch Phase			
Minimum Initial (s)	5.0	5.0	5.0
Minimum Split (s)	22.0	22.0	22.0
Total Split (s)	140.0	40.0	140.0
Total Split (%)	78%	22%	78%
Maximum Green (s)	138.0	38.0	138.0
Yellow Time (s)	2.0	2.0	2.0
All-Red Time (s)	0.0	0.0	0.0
Lost Time Adjust (s)			
Total Lost Time (s)			
Lead/Lag			
Lead-Lag Optimize?			
Vehicle Extension (s)	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0
Recall Mode	Max	Max	Max
Walk Time (s)	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0
Intersection Summary			
Cycle Length: 180			
Actuated Cycle Length: 180			
Offset: 0 (0%), Referenced to phase 2/NBT and 6/SBT, Start of Green			
Natural Cycle: 45			
Control Type: Prelimed			
Splits and Phases: 14: Kerr Street & Rail Track			
Ø2 (R)	138.0	38.0	138.0
Ø4 (R)			
Ø6 (R)			

Queues
14.: Kerr Street & Rail Track

HCM Signalized Intersection Capacity Analysis
14.: Kerr Street & Rail Track

Future Total PM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Future Total PM (Phase 2) Kerr St Closure
Upper Kerr Village (8/24-01)

Lane Group	
Lane Group Flow (vph)	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
Queue Length 50th (m)	
Queue Length 95th (m)	
Internal Link Dist (m)	
Turn Bay Length (m)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)											
Lane Util. Factor											
Flt Protected											
Satd. Flow (prot)											
Flt Permitted											
Satd. Flow (perm)											
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	0	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type											
Protected Phases		4					2				6
Permitted Phases											
Actuated Green, G (s)											
Effective Green, g (s)											
Actuated g/C Ratio											
Clearance Time (s)											
Lane Grp Cap (vph)											
v/s Ratio Prot											
v/c Ratio											
Uniform Delay, d1											
Progression Factor											
Incremental Delay, d2											
Delay (s)											
Level of Service											
Approach Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Approach LOS	A	A	A	A	A	A	A	A	A	A	A
Intersection Summary											
HCM 2000 Control Delay			0.0								A
HCM 2000 Volume to Capacity ratio			0.00								
Actuated Cycle Length (s)			180.0								4.0
Intersection Capacity Utilization			0.0%								A
Analysis Period (min)			15								
c Critical Lane Group											