



**BA Group**

# **UPPER KERR VILLAGE PART 2 TRANSPORTATION ASSESSMENT - OFFICIAL PLAN AMENDMENT**

Transportation Considerations Report

Prepared For: Urban Strategies Inc.

February 2, 2022



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# 1.0 INTRODUCTION

## 1.1 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”). This report is in support of 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 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 A, Schedule O1**, the lands north of Speers Road and west of Kerr Street and **Appendix C, 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. (See **Appendix D**). 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 B**) 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	Post Expropriation Land Area (ha)	Retail GFA (sq m)	Above Grade Parking (sq m)	Residential GFA (sq m)	Total GFA (sq m)	# of Units	Total NFA (sq m)	FSI
588 Kerr (AREA A)	0.9	1,000	6,500	40,000	47,500	430	40,380	4.5
550 Kerr (AREA B)	0.8	1,900	2,800	40,000	44,700	428	34,850	4.4
530 Kerr + 131 Speers (AREA C)	1.2	4,000	0	48,000	52,000	516	44,200	3.6
171 Speers (AREA D)	1.9	1,000	5,000	44,000	50,000	473	42,500	2.3
<b>TOTAL</b>	<b>4.8</b>	<b>7,900</b>	<b>2,800</b>	<b>172,000</b>	<b>194,200</b>	<b>1,847</b>	<b>161,930</b>	<b>3.4</b>

Source: USI Land Use estimates based upon Draft OPA provisions, Nov. 12 2021

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 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 in **Appendix D**.

This report is Part 2 of the complete set of transportation assessments that will provide support for the Comprehensive development Plan and Draft OPA provisions. Part 1, submitted to the Town of Oakville in November of 2021, was a high-level overview of the transportation considerations relevant to the Subject Site. Part 2 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.

The following sections of the Part 2 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. The Part 2 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, 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 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 configuration 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 194,200 square metres of total GFA. This breaks down into approximately 172,000 square metres of residential GFA and 7,900 square metres of retail GFA.

For the purposes of the transportation assessment this translates into approximately 1,845 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 (See **Appendix D – Draft OPA Schedule A**) 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 – See **Appendix D – Draft OPA Schedule D**) 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 (See Appendix D Draft OPA, 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.
  - 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.
  - 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.
- **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) and to service vehicle areas. 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 C** 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

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.

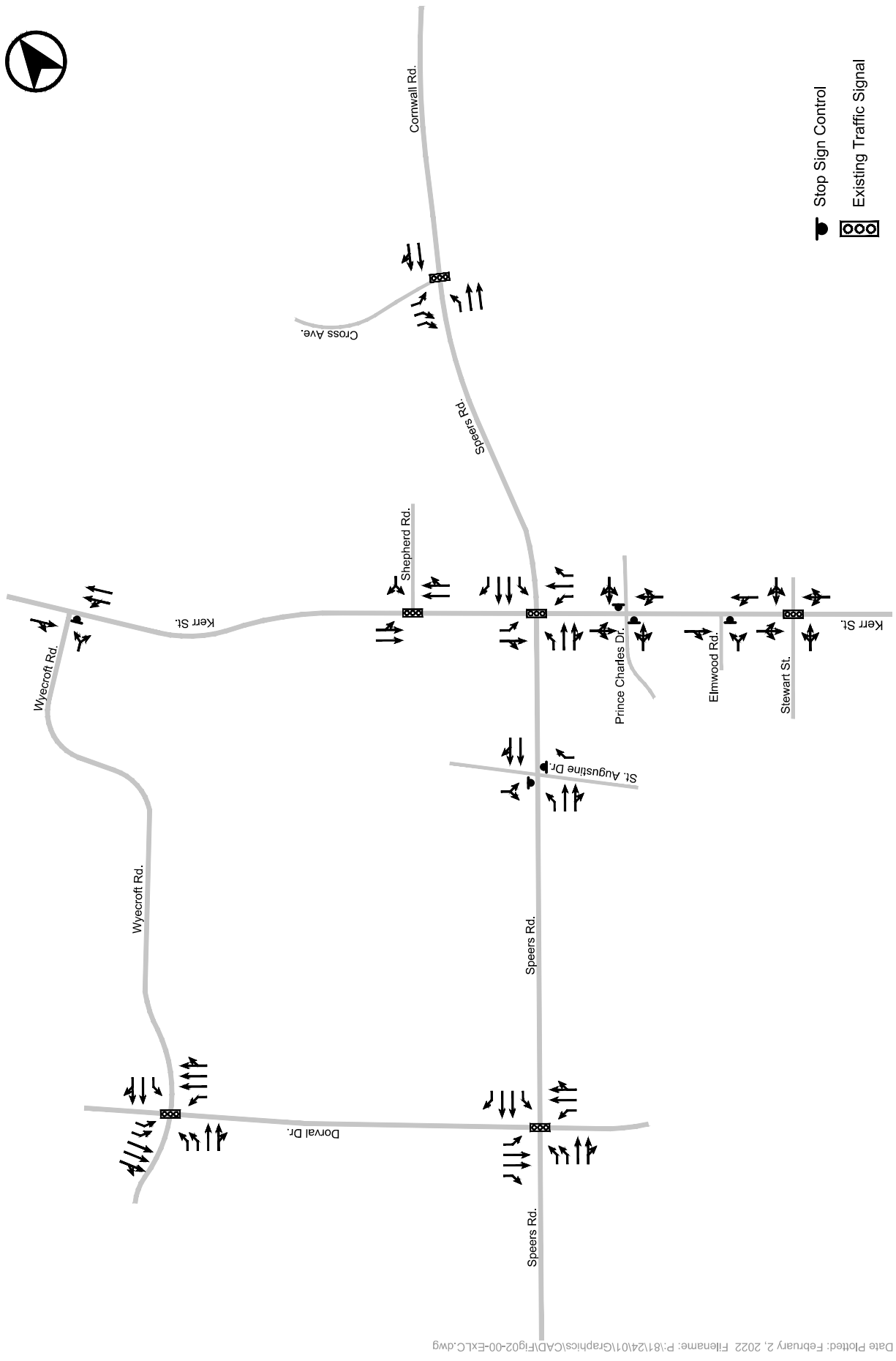
In addition to the regular transit service offered by Oakville Transit, an Accessibility Service referred to as Care-A-Van is provided that offers door-to-door service for anyone unable to use conventional transit service. This service has flexible hours and is offered 7 days a week.

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.

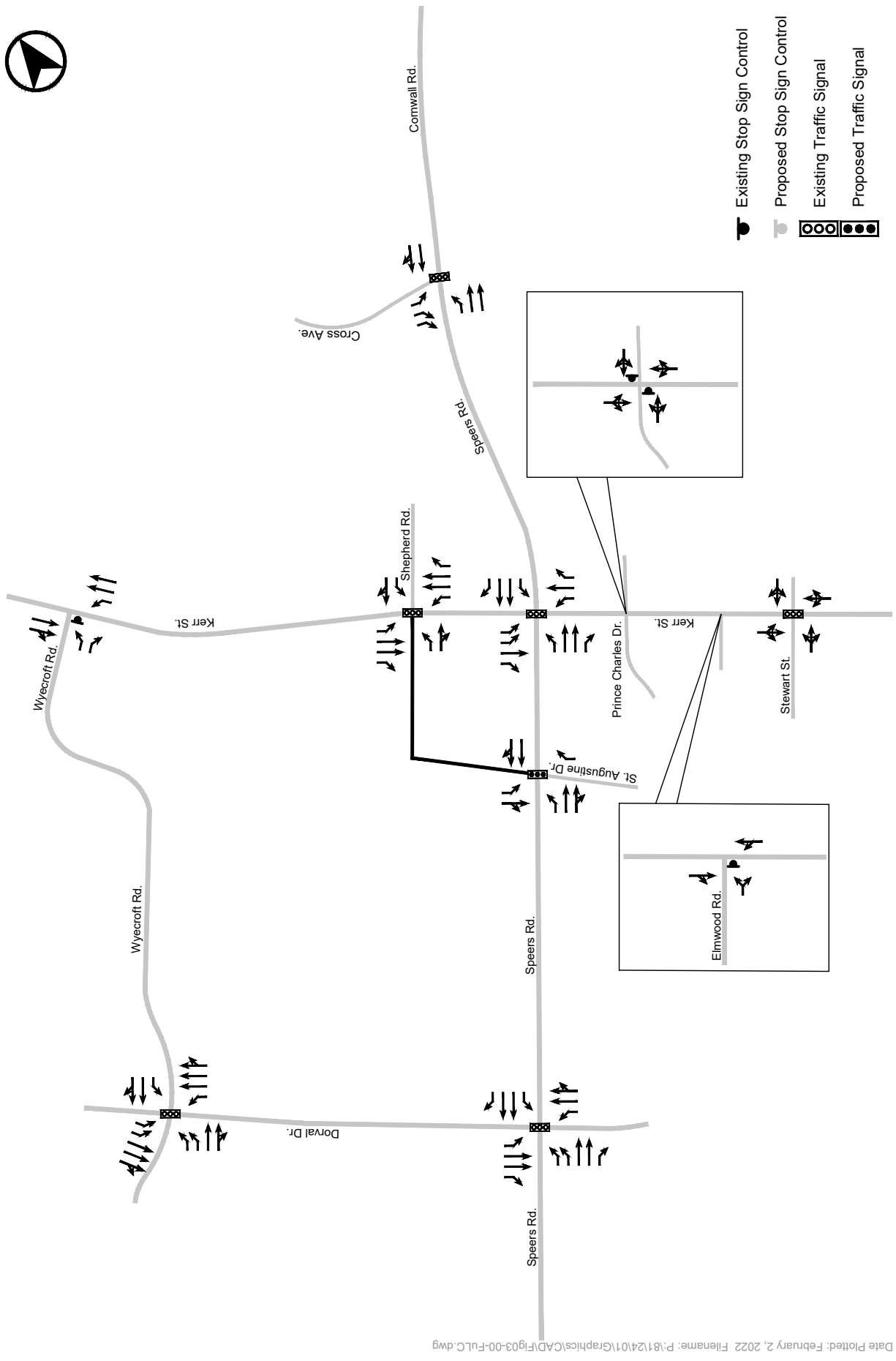
As part of the Transportation Demand Management plans that will form part of the mobility strategy for development within Upper Kerr Village, enhanced connections between the development within Upper Kerr Village and the public street frontages should be mandated to provide high quality, convenience 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 (reflected in the **Draft OPA Schedules A through D – Appendix D**) 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 (**Schedule A of the Draft OPA – Appendix D**).

#### 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) 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

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.

### **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**

<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>LAND USE INTEGRATION</b></p>		<p><b>Intent:</b> 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><b>Implementation:</b></p> <ul style="list-style-type: none"> <li>• To the extent possible, mixed use developments should maximize the non-residential floor space within the development applications.</li> <li>• There are a variety of retail, employment, entertainment, institutional, and recreational opportunities within the surrounding area.</li> </ul>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>TRANSIT USE</b></p>		<p><b>Intent:</b> 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><b>Implementation:</b></p> <ul style="list-style-type: none"> <li>• The Site is within 900+ metres of the Oakville GO Station;</li> <li>• The Site is within immediate proximity of five (5) existing Oakville transit routes;</li> <li>• The Site is immediately adjacent to Oakville Transit bus stops that service the surface routes that run along Speers Road and Kerr Street.</li> <li>• 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.</li> </ul>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>BICYCLE FACILITIES</b></p>		<p><b>Intent:</b> Provide cycling infrastructure that supports and promotes cycling as a convenient and viable travel alternative to the personal automobile.</p>	<p><b>Implementation:</b></p> <ul style="list-style-type: none"> <li>• 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).</li> <li>• Bike parking should exceed minimum requirements as part of a comprehensive TDM multi-modal plan.</li> <li>• 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.</li> <li>• 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.</li> <li>• Consider also E-bikes or E-scooters as alternative modes to be accommodated at individual developments.</li> </ul>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">PEDESTRIAN CONNECTIVITY</p>		<p><b>Intent:</b> 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><b>Implementation:</b></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• These connections should be enhanced to create a better walking / cycling experience.</li> <li>• 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.</li> </ul>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">PARKING MANAGEMENT</p>		<p><b>Intent:</b> 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><b>Implementation:</b></p> <ul style="list-style-type: none"> <li>• Shared parking principles should be taken advantage of to the fullest extent within mixed-use developments.</li> <li>• 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.</li> <li>• 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.</li> </ul>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">CAR-SHARE</p>		<p><b>Intent:</b> 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><b>Implementation:</b></p> <ul style="list-style-type: none"> <li>• Information should be provided to residents and employees related to the availability of area car-share options when purchasing a unit.</li> <li>• Consideration should be given to providing each dwelling with 2-year car share membership.</li> <li>• 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.</li> </ul>

COORDINATION, COMMUNICATION, PROMOTION		<p><b>Intent:</b></p> <p>Inform, raise awareness, and actively promote non-automobile travel options for the Site.</p>	<p><b>Implementation:</b></p> <ul style="list-style-type: none"> <li>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.</li> </ul>

## 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.

### 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 planed private street would be extended south to intersect with Speers Road. The east-west portion of the private street would be constructed as park 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 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 the proposed Draft OPA levels of intensity. This assessment is found in **Section 8.0** 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 SUMMARY OF TRANSPORTATION ANALYSES PARAMETERS

### 7.1 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)

### 7.2 HORIZON YEARS

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

### 7.3 ANALYSIS PERIODS

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

## 7.4 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.

## 7.5 FUTURE BACKGROUND TRAFFIC VOLUME CONDITION

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 3**.
- 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 3 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.

## 7.6 UPPER KERR VILLAGE SITE VEHICULAR TRAVEL FORECASTS

### 7.6.1 Traffic Generation

Traffic generation estimates were based upon a review of ITE (11th Ed.) Trip Generation rates for both Suburban and Urban conditions as well as a review of proxy trip generation counts of residential developments in similar contexts within the GTA and Oakville.

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. **Appendix H** contains the adjusted modal split assumptions adopted in the analyses herein as well as the adopted retail trip generation rates – ITE Shopping Centre Average Rate.

**TABLE 4 RESIDENTIAL UNIT TRIP GENERATION RATES**

Proxy	Units	AM			PM		
		In	Out	2-Way	In	Out	2-Way
ITE11th - LU222 (General Urban/Suburban)							
Not close to rail transit	1,845 units	0.08	0.15	0.23	0.15	0.12	0.27
ITE11th - LU222 (Dense Multi-Use Urban)							
Close to Rail Transit		0.02	0.16	0.18	0.10	0.04	0.14
1297 Marlborough Crt & 1360 White Oaks Blvd	266 units	0.09	0.17	0.26	0.19	0.13	0.32
75-95 Charolais, Brampton		0.07	0.17	0.24	0.20	0.10	0.29
430 McMurchy, Brampton		0.04	0.15	0.18	0.12	0.10	0.22
440 McMurchy, Brampton		0.09	0.17	0.25	0.22	0.13	0.35
20, 40, 60 Oak Mills Rd (Tue, Oct 24, 2006)	300 units	0.04	0.22	0.26	0.22	0.09	0.31
<b>Selected Trip Rates</b>		<b>0.05</b>	<b>0.15</b>	<b>0.20</b>	<b>0.12</b>	<b>0.08</b>	<b>0.20</b>

**Table 5** presents the vehicular traffic generation estimates associated with the major land uses within the Upper Kerr Village per the Draft OPA provisions. Note that only the commercial GFA located within the SE corner of the Subject Site was assigned external traffic volumes given the anticipated internalized nature of traffic associated with the ground floor retail amongst the balance of the Subject Site

**TABLE 5 FORECAST VEHICLE TRIP GENERATION - UPPER KERR VILLAGE**

**VEHICLE TRIP GENERATION**

Parameter	Scale	AM			PM		
		In	Out	2-Way	In	Out	2-Way
Residential Vehicle Trips	1,845 units	100	270	370	225	140	365
<b>Residential Vehicle Trip Rate</b>	<b>1,845 units</b>	<b>0.05</b>	<b>0.15</b>	<b>0.20</b>	<b>0.12</b>	<b>0.08</b>	<b>0.20</b>
Retail Vehicle Trips	57,244 sf	20	15	35	55	40	95
<b>Retail Vehicle Trip Rate</b>	<b>57,244 sf</b>	<b>0.35</b>	<b>0.26</b>	<b>0.61</b>	<b>0.96</b>	<b>0.70</b>	<b>1.66</b>
<i>Pass-by Trips</i>	<i>30%</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>15</i>	<i>15</i>	<i>30</i>
<i>Primary Trips</i>	<i>70%</i>	<i>20</i>	<i>15</i>	<i>35</i>	<i>40</i>	<i>25</i>	<i>65</i>

**7.6.2 Travel Distribution**

Vehicular distribution was estimated based upon a review of the 2016 TTS origin and destination (OD) data sets for the area west of Sixteen Mile Creek. 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 6** summarizes the vehicular distribution adopted for analyses purposes.

**TABLE 6 VEHICULAR TRIP DISTRIBUTION ASSUMPTIONS – UPPER KERR VILLAGE SITE TRAFFIC**

Route	Residential		Retail	
	Outbound	Inbound	Outbound	Inbound
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 Wyecroft Rd	4%	5%	1%	14%
To/From South on Queen Mary Dr	4%	5%	11%	6%

### 7.6.3 Subject Site Traffic Assignments

#### 7.6.3.1 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.

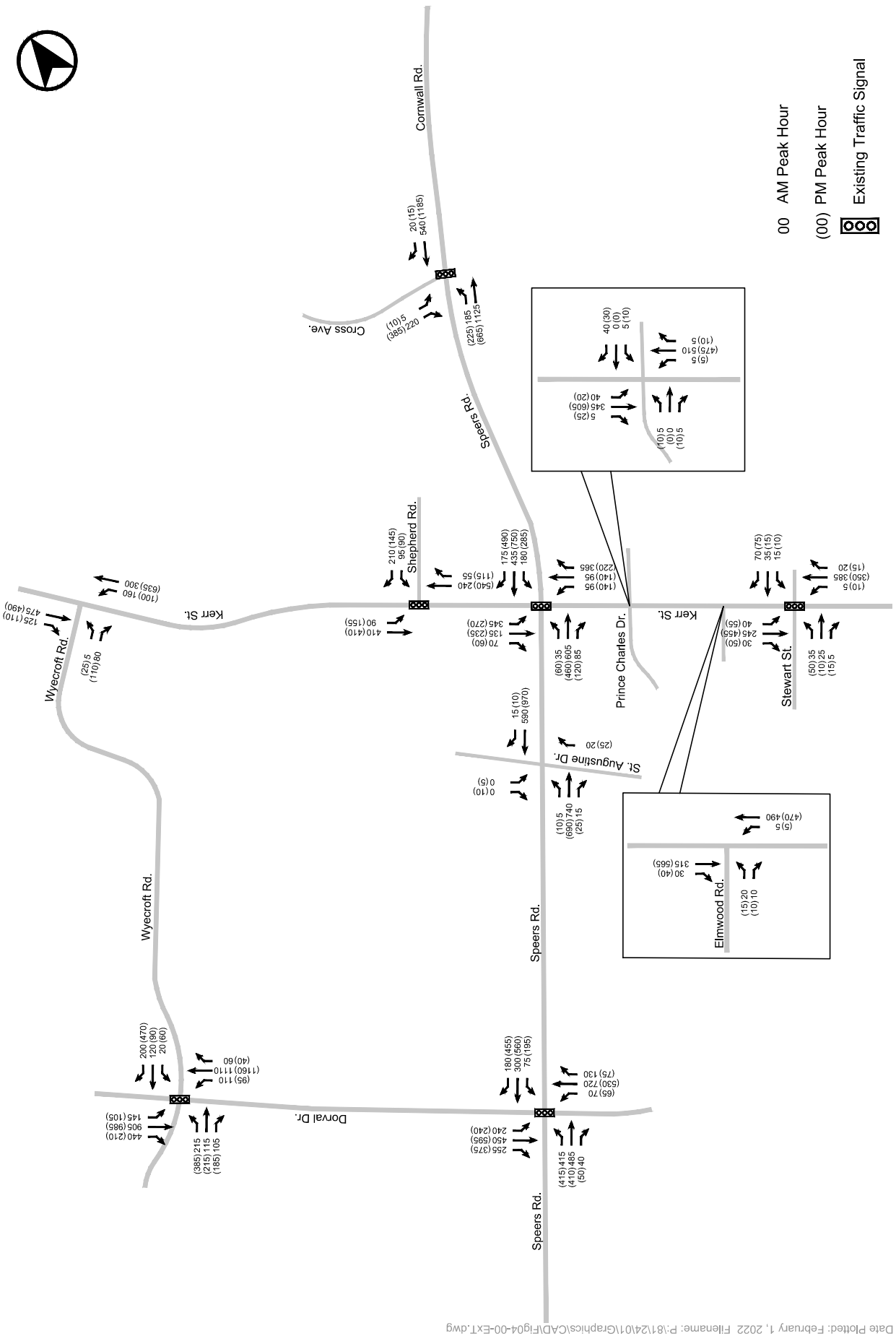
These two conditions examine the resulting operating conditions in response to potential redevelopment decisions associated with 171 Speers Road. We note that the Subject Site can be configured in response to this condition given the “private street” proposed within the Subject Site. The private street 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:

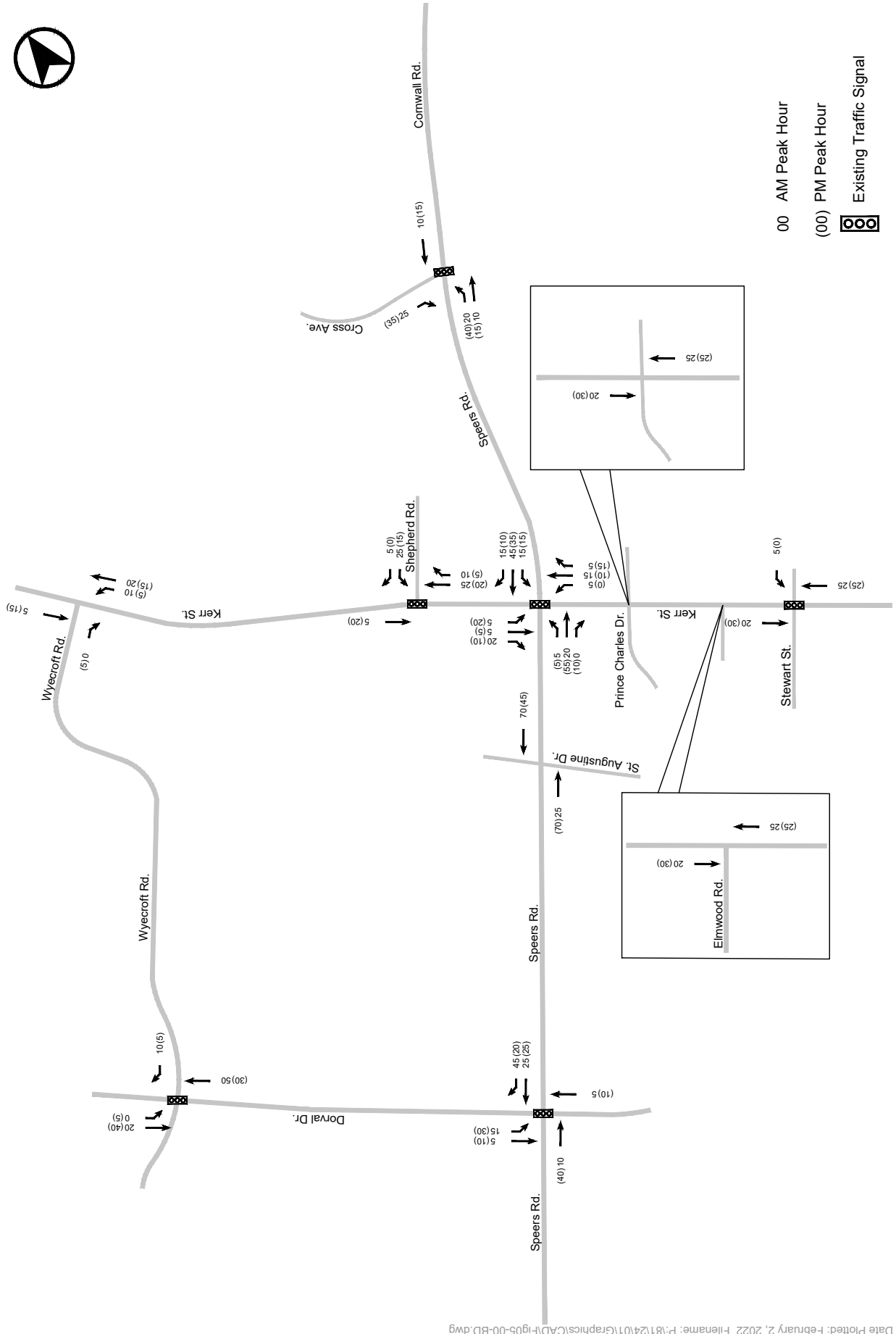
- **Figure 7** – illustrates the Existing Subject Site Traffic volume Removal (Interim Condition)
- **Figure 8** – illustrates the Existing Subject Site Traffic volume Removal (Ultimate Condition)
- **Figure 9** – illustrates the New Subject Site Traffic Volume (Interim Condition)
- **Figure 10** – illustrates 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)





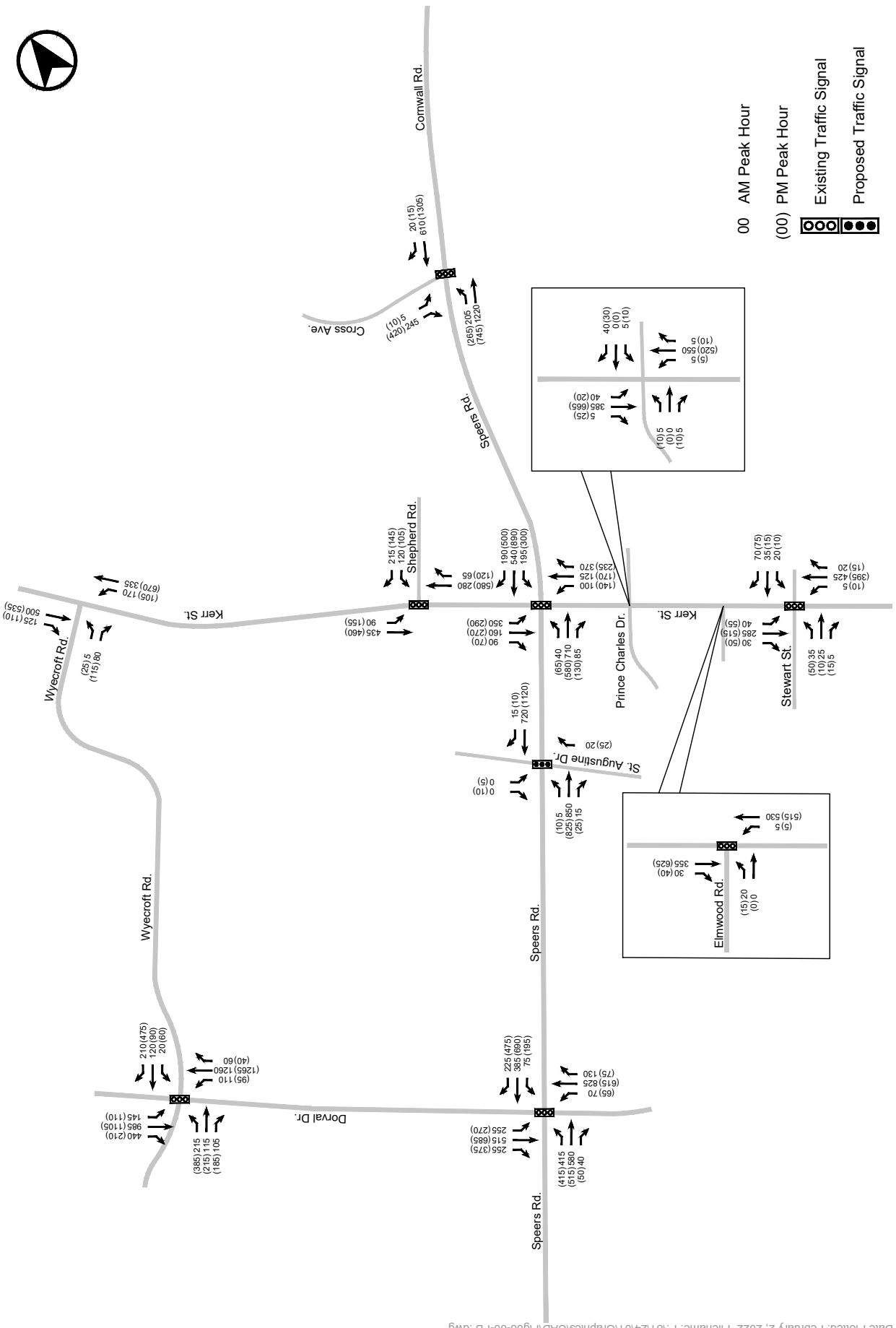
Date Plotted: February 1, 2022 File name: P:\8124\01\Graphics\CAD\Fig04-00-EXT.dwg

**FIGURE 4 EXISTING TRAFFIC VOLUMES**



Date Plotted: February 2, 2022 File name: P:\81124\01\Graphics\CAD\Fig05-00-BD.dwg

**FIGURE 5 BACKGROUND DEVELOPMENT TRAFFIC VOLUMES**

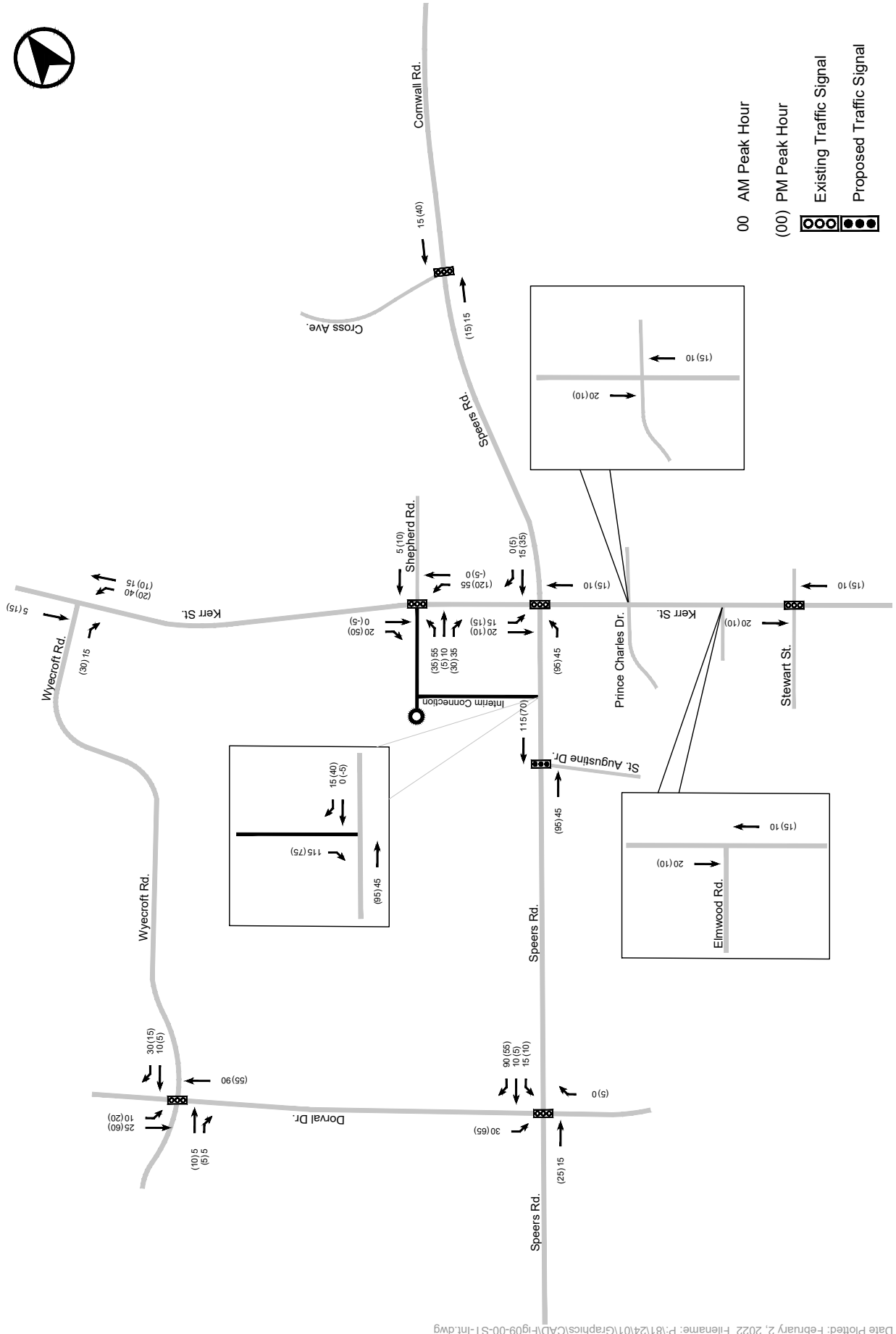


Date Plotted: February 2, 2022 File name: P:\8124\01\Graphics\CAD\Fig06-00-FB.dwg

**FIGURE 6 FUTURE BACKGROUND TRAFFIC VOLUMES**

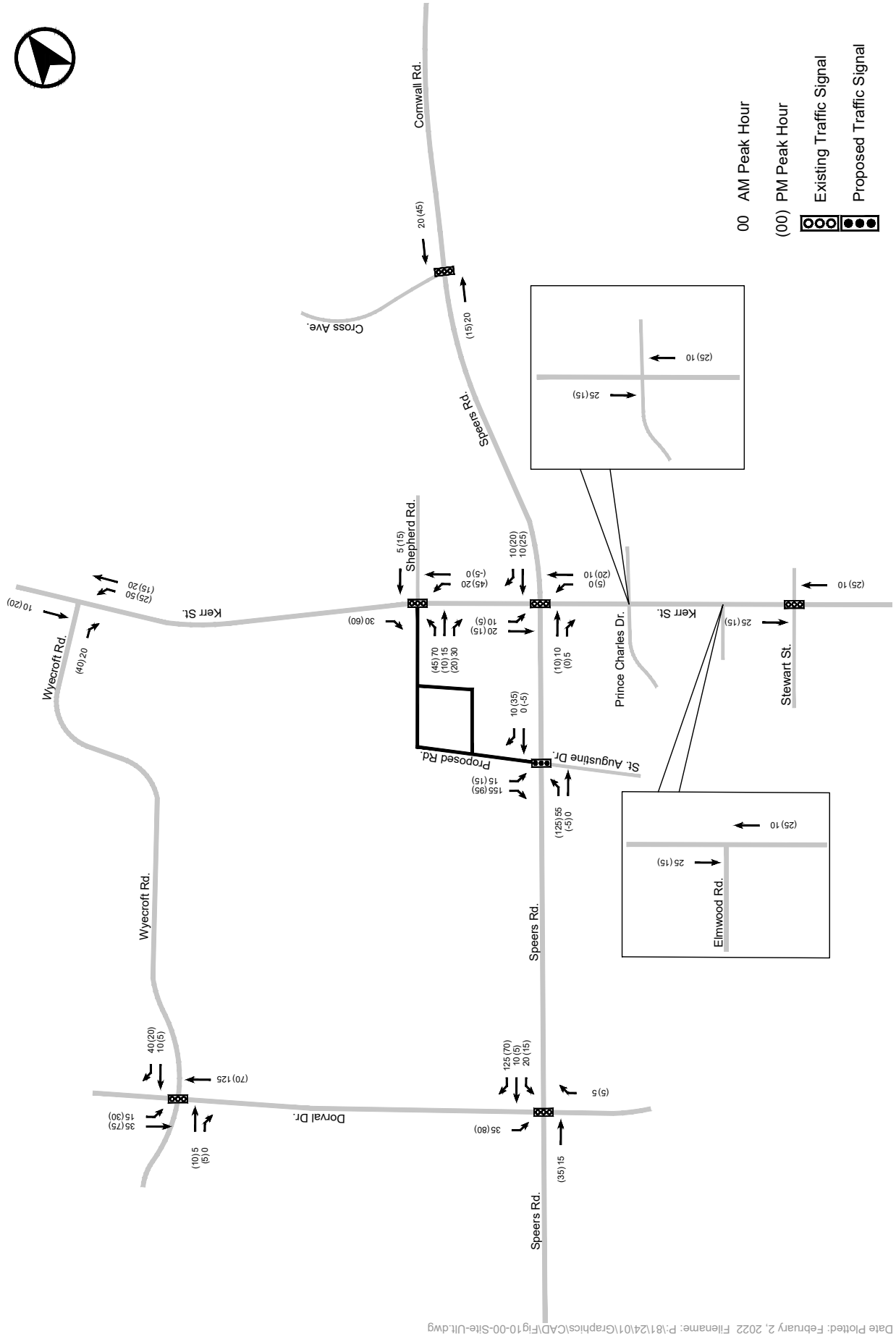






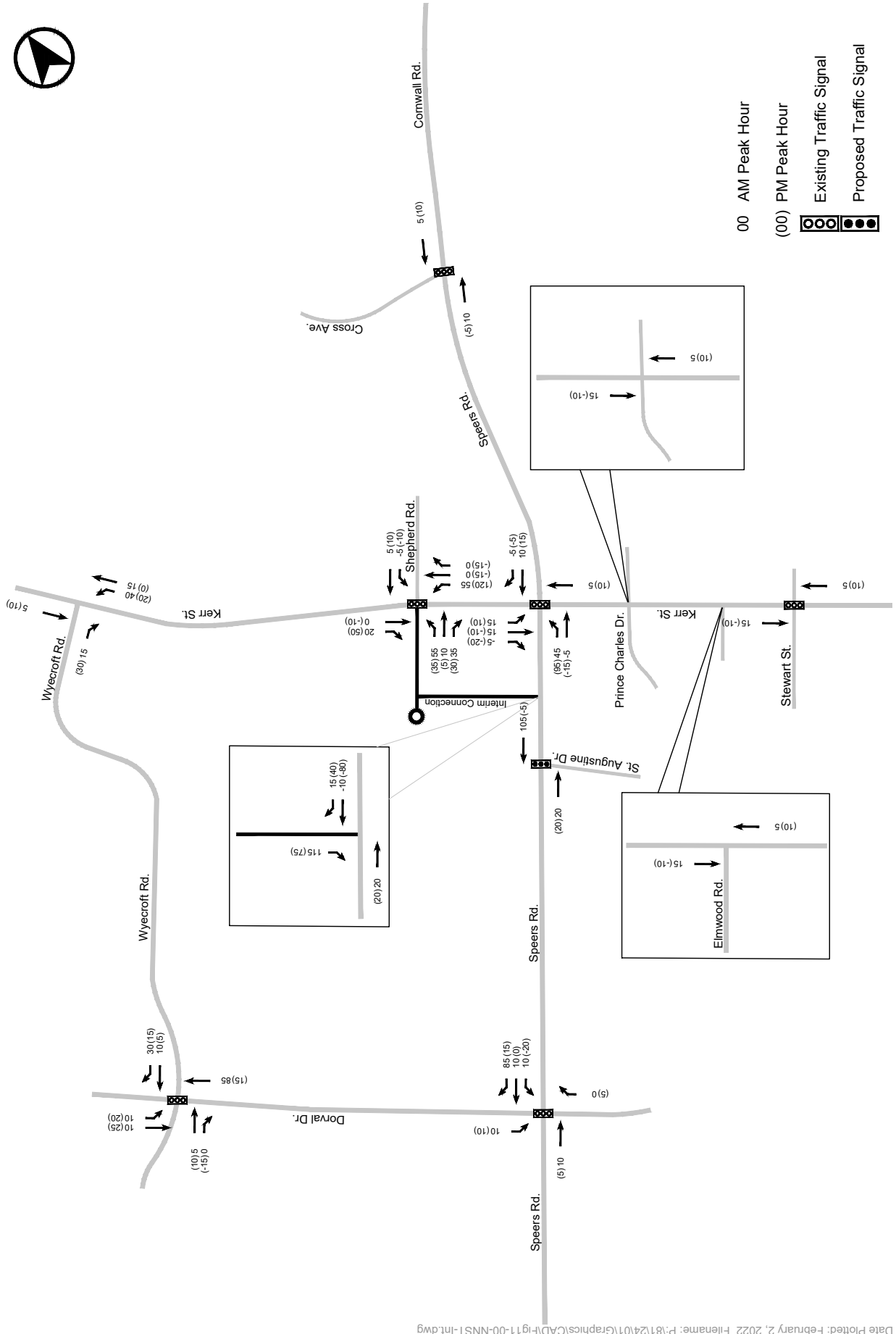
Date Plotted: February 2, 2022 Filename: P:\8124\01\Graphics\CAD\Fig09-00-ST-Int.dwg

FIGURE 9 NEW SITE TRAFFIC VOLUMES (INTERIM)



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

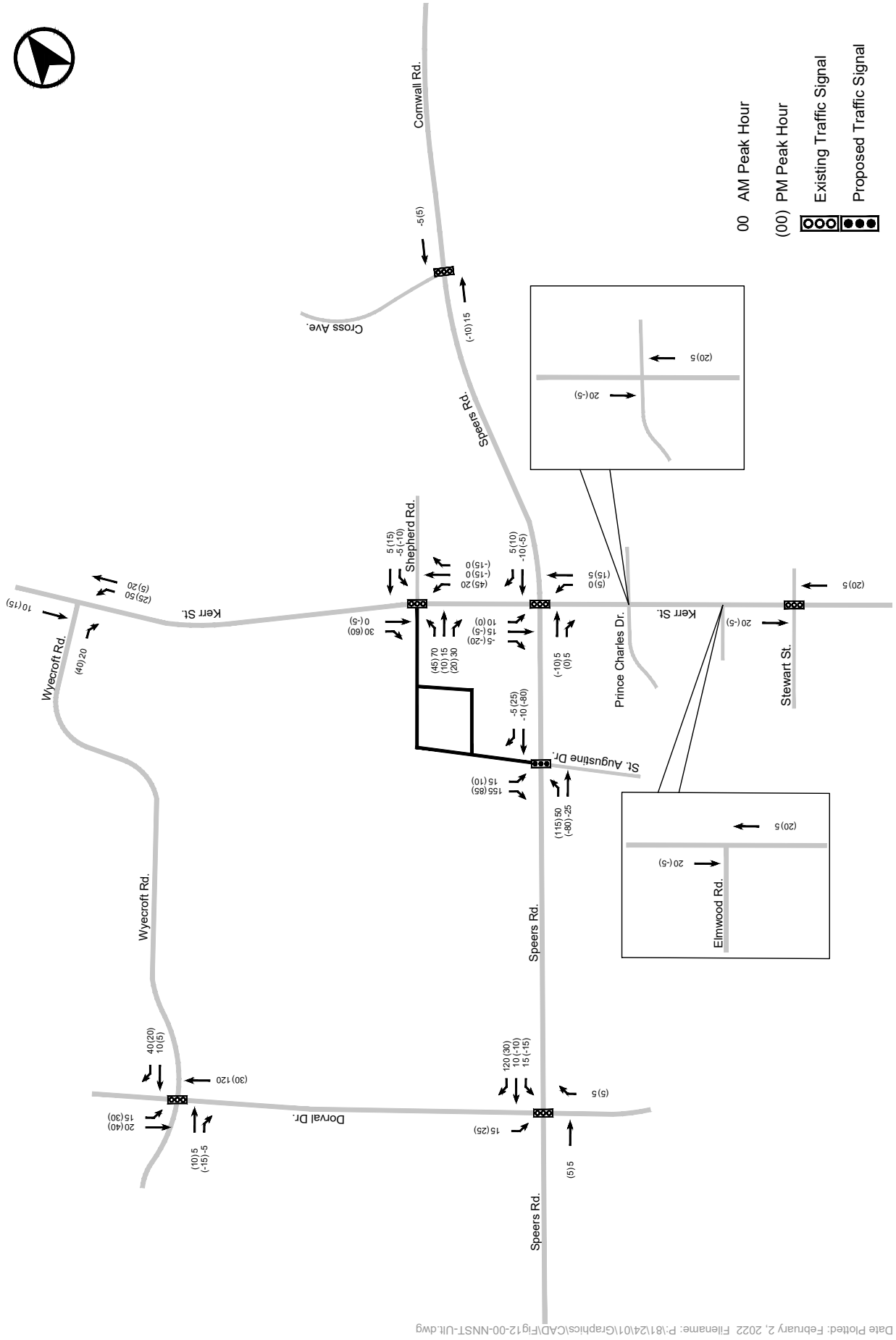
**FIGURE 10 NEW SITE TRAFFIC VOLUMES (ULTIMATE)**



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

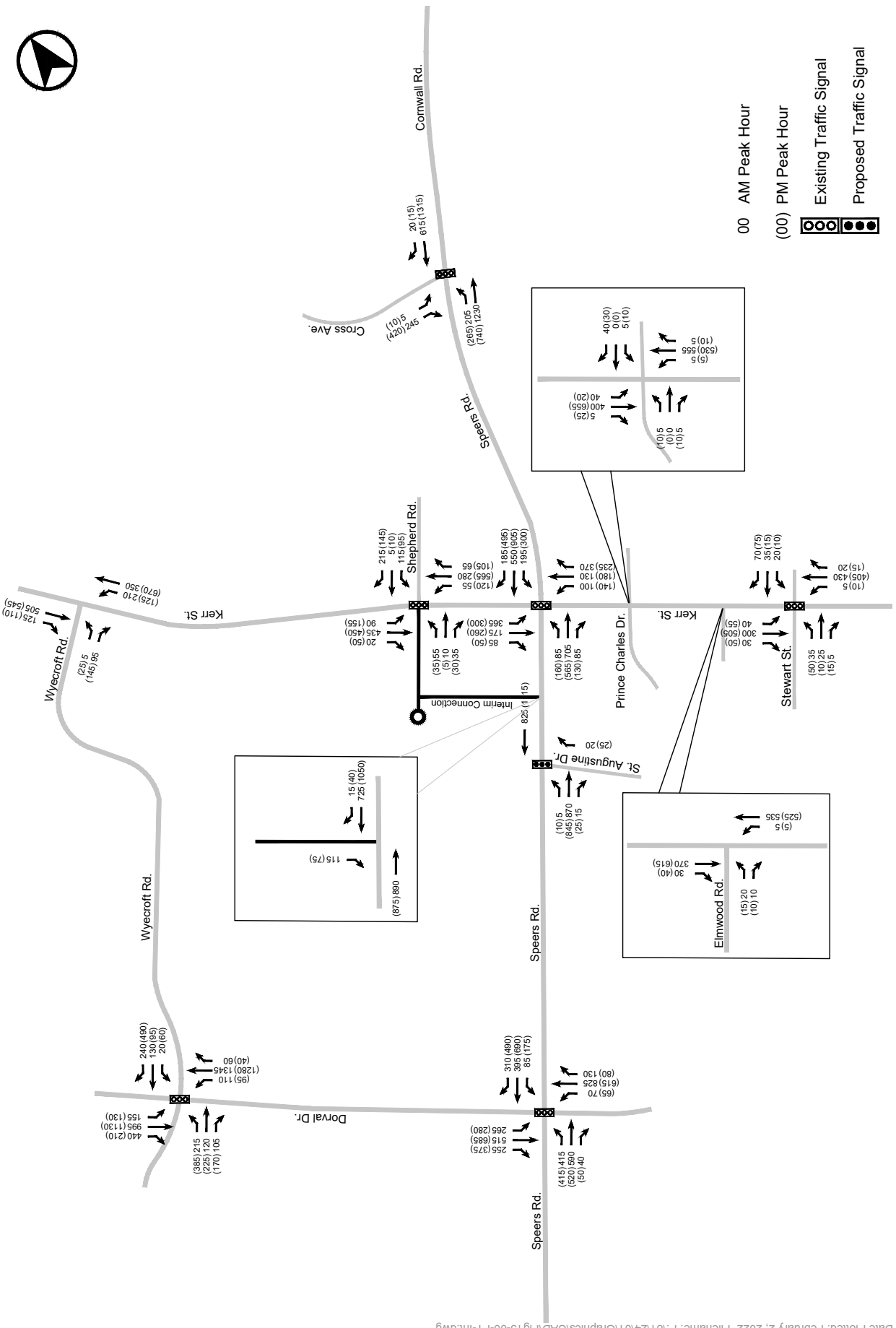
**FIGURE 11 NET NEW SITE TRAFFIC VOLUMES (INTERIM)**





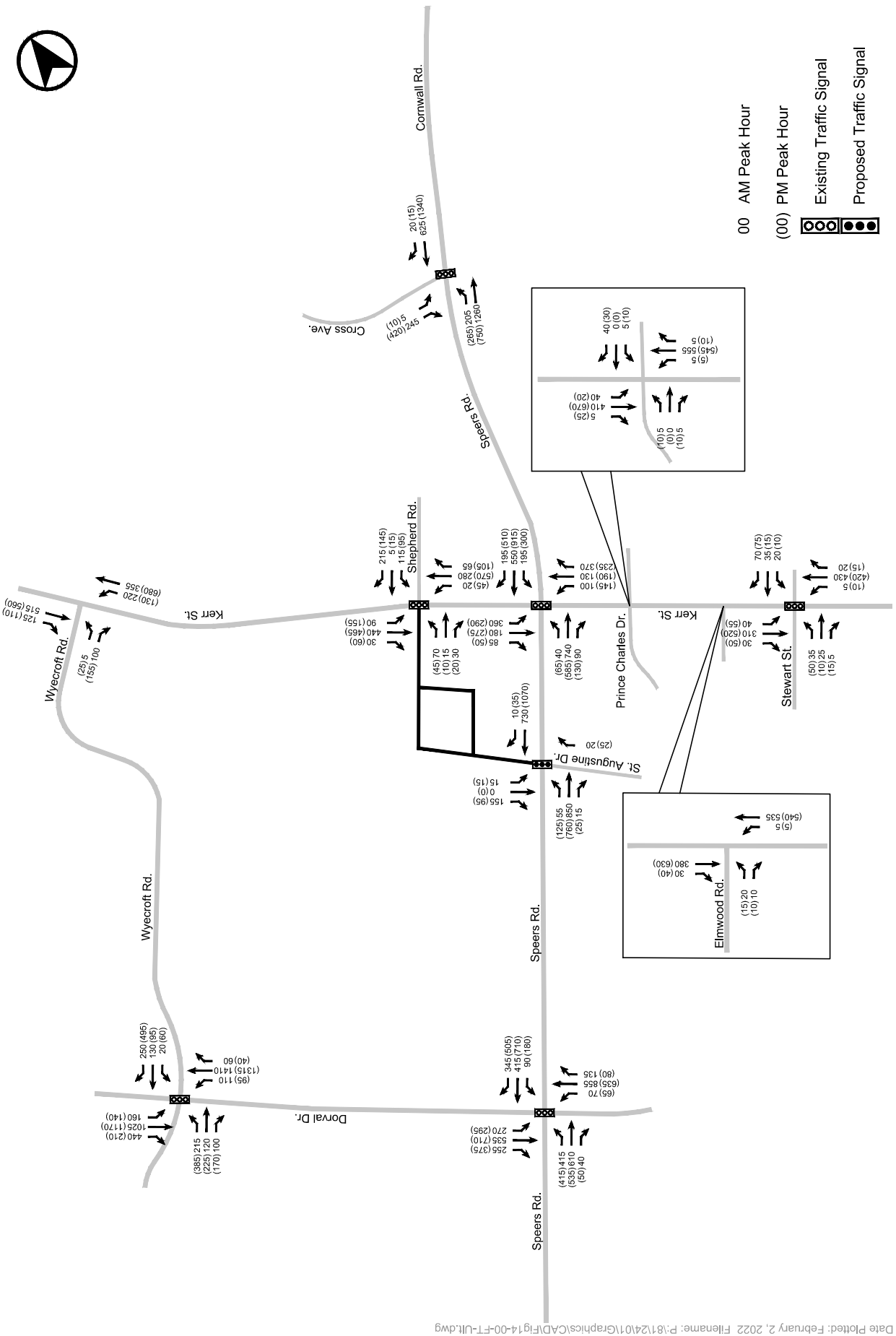
Date Plotted: February 2, 2022 Filename: P:\8124\01\Graphics\CAD\Fig12-00-NNST-Ult.dwg

FIGURE 12 NET NEW SITE TRAFFIC VOLUMES (ULTIMATE)



Date Plotted: February 2, 2022 File name: P:\8124\01\Graphics\CAD\Fig13-00-FT-Int.dwg

**FIGURE 13 FUTURE TOTAL TRAFFIC VOLUMES (INTERIM)**



Date Plotted: February 2, 2022 File name: P:\8124\0\Graphics\CAD\Fig14-00-F-T-Ult.dwg

**FIGURE 14 FUTURE TOTAL TRAFFIC VOLUMES (ULTIMATE)**

## 8.0 PUBLIC STREET NETWORK ANALYSIS SUMMARY

### 8.1 ANALYSES PARAMETERS

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

### 8.2 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 is presented in **Appendix I**.

### 8.3 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**.

## 9.0 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”). This report is in support of 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, Halton Region.

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 B**) 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 report forms Part 2 of the transportation assessment (incorporating Part 1) and considers 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.

## 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.

## Draft OPA and Comprehensive Development Plan

- The Draft OPA for the Subject Site will permit approximately 194,200 square metres of total GFA. This breaks down into approximately 172,000 square metres of residential GFA, 7,900 square metres of retail GFA and 14,300 square metres of above grade parking.
- For the purposes of the transportation assessment this translates into approximately 1,845 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.

### **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 Accessibility Service referred to as Care-A-Van is provided that offers door-to-door service for anyone unable to use conventional transit service. This service has flexible hours and is offered 7 days a week.
  - 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 provide 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.
  - 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.
  - 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 this “Interim” development scenario.
- Local Area Review
  - Assessment of the travel characteristics from an analytical perspective have been assessed in this Part 2 Transportation Assessment described Section \* 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 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.
- The results of the analyses indicate that all Study Area intersections are forecast to operate under acceptable conditions under both Interim and Ultimate scenarios.
- 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.

### **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 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.

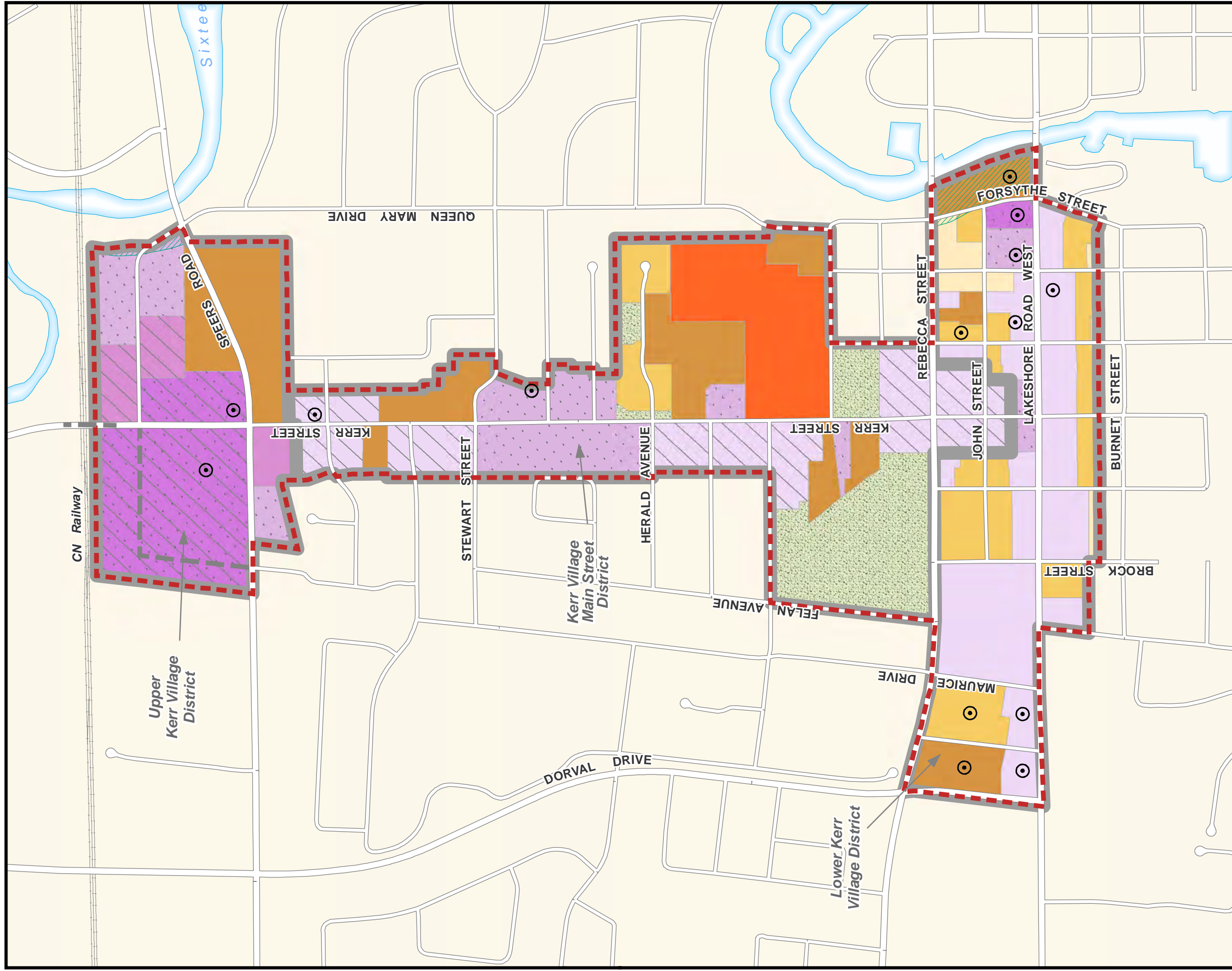
The Draft OPA and proposed Comprehensive Development Plan is consistent with and confirms to provincial, regional and municipal policies by planning to:

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





# SCHEDULE O1 KERR VILLAGE LAND USE

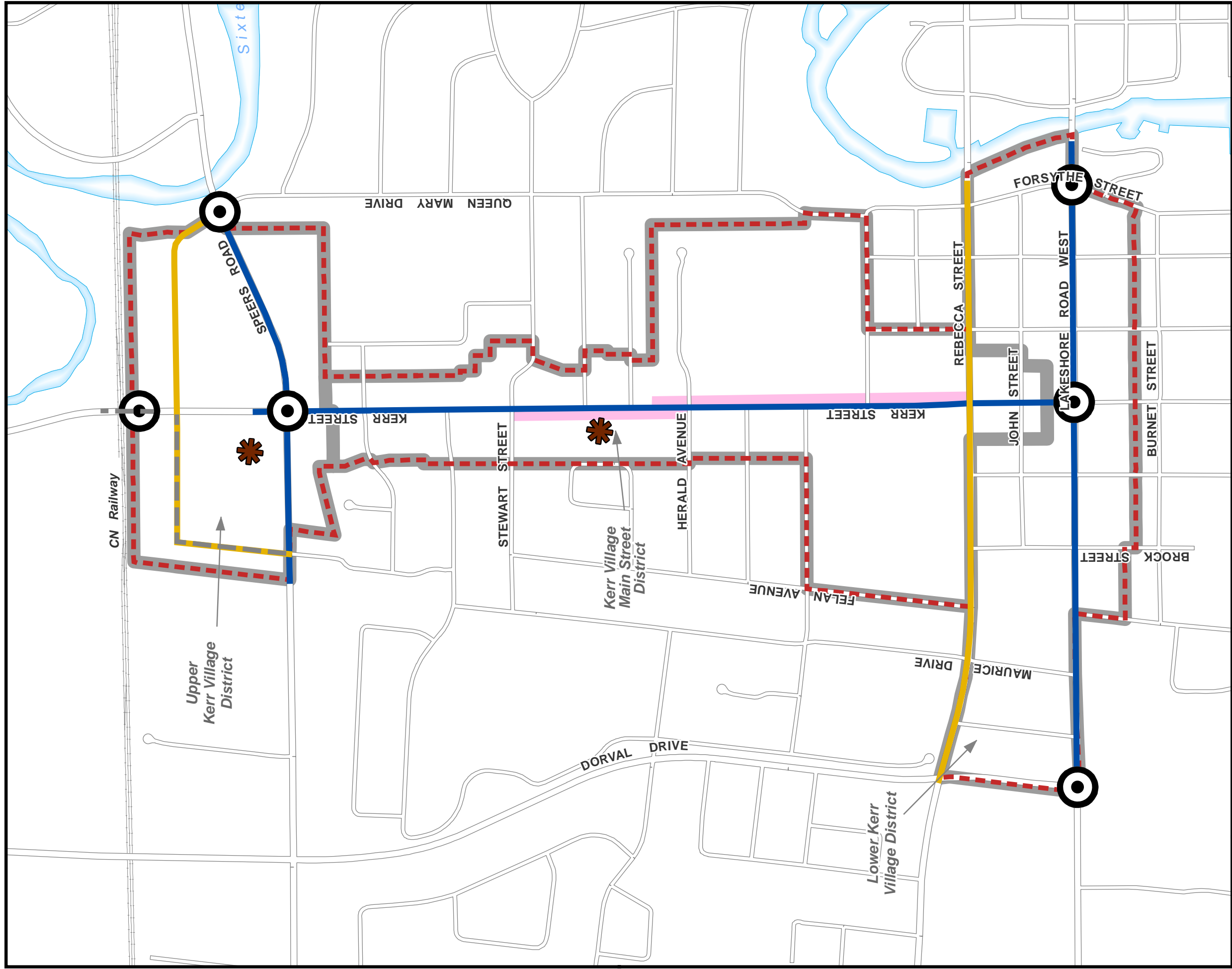


- GROWTH AREA BOUNDARY
- LOW DENSITY RESIDENTIAL
- PARKS AND OPEN SPACE
- MEDIUM DENSITY RESIDENTIAL
- HIGH DENSITY RESIDENTIAL
- GREENBELT - URBAN RIVER VALLEY
- MAIN STREET 1
- MAIN STREET 2
- URBAN CENTRE
- URBAN CORE
- INSTITUTIONAL
- LANDS ELIGIBLE FOR BONUSING
- DISTRICT BOUNDARIES
- PROPOSED ROADS
- RAILWAY

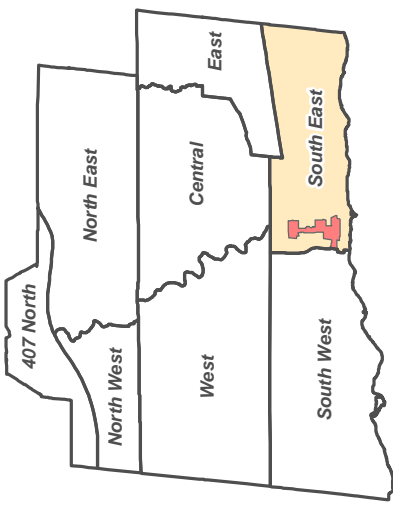
Refer to Part E, Kerr Village, for Growth Area Policies  
 Refer to Part E, Kerr Village Exceptions












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 B:  
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.

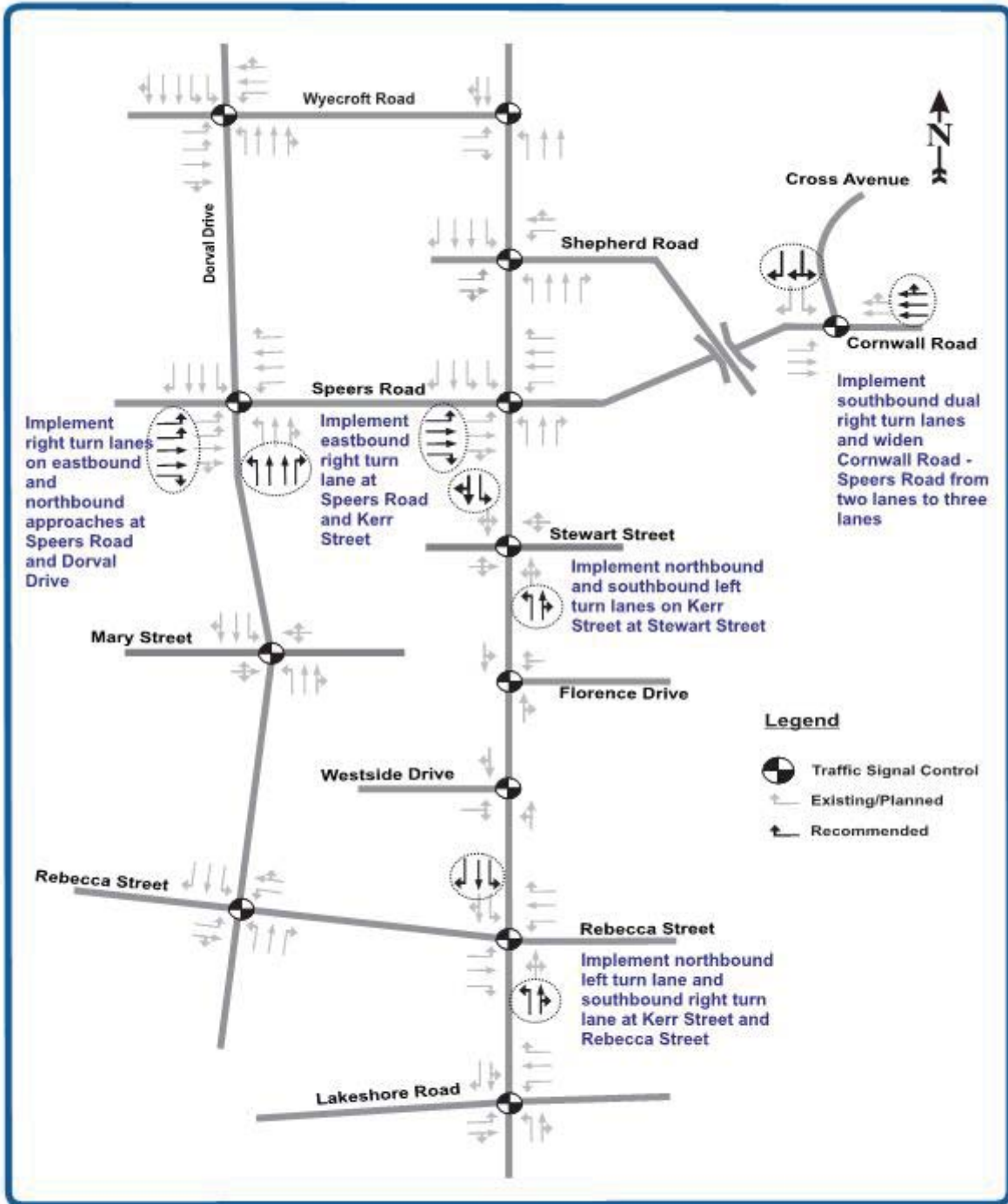
## 23.8.3 Programs and Initiatives

- 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.

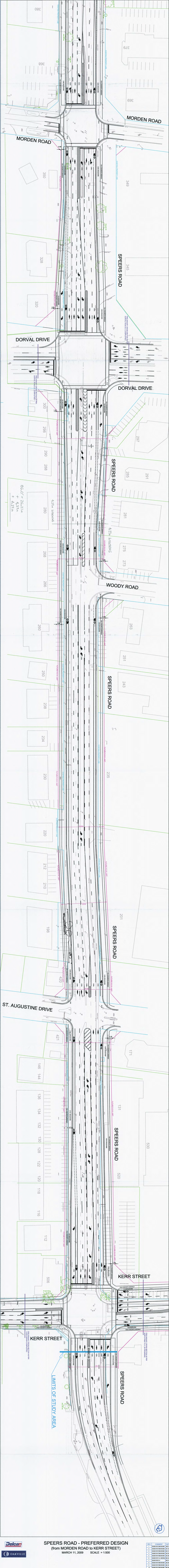
**APPENDIX C:  
Prior Recommended Public Street Improvements – 2009 Kerr  
Village Transportation Assessment and the 2009 Speers Road  
Environmental Study Report excerpts**





**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 RECEIVED	NOV 10/08





**APPENDIX D:  
Draft OPA and Draft OPA Schedules – Prepared by Urban  
Strategies Inc., November 11, 2021**



**THE CORPORATION OF THE TOWN OF OAKVILLE**

**BY-LAW NUMBER 2021-XXX**

Official Plan Amendment Number XX

A by-law to adopt an amendment to the Livable Oakville Plan, Official Plan Amendment Number XX (Town of Oakville, 530, 550, 588 Kerr Street, and, 131, 171 Speers Road; File XX.XX.XXX)

WHEREAS the Livable Oakville Official Plan, which applies to the lands west of Kerr Street and north of Speers Road, was adopted by Council on June 22, 2009, and approved with modifications adjudicating the majority of appeals by the Ontario Municipal Board on May 10, 2011; and,

WHEREAS subsection 21(1) of the *Planning Act*, R.S.O. 1990, C.P.13, as amended, states that a council of a municipality that is within a planning area may initiate an amendment to any official plan that applies to the municipality, and section 17 applies to any such amendment; and,

WHEREAS it is deemed necessary to pass an amendment to the Livable Oakville Plan to implement the comprehensive development plan on the lands municipally known in the year 2021 as 530, 550, 588 Kerr Street and 131, 171 Speers Road.

**COUNCIL ENACTS AS FOLLOWS:**

1. The attached Amendment Number XX to the Livable Oakville Plan is hereby adopted.
2. Pursuant to subsection 17(27) of the Planning Act, R.S.O. 1990, c.P.13, as amended, this Official Plan Amendment comes into effect upon the day after the last day for filing a notice of appeal, if no appeal is filed pursuant to subsections 17(24) and (25). Where one or more appeals have been filed under subsection 17(24) and (25) of the said Act, as amended, this Official Plan Amendment comes into effect when all such appeals have been withdrawn or finally disposed of.
3. In the event that the Regional Municipality of Halton, being the Approval Authority, declares this Official Plan Amendment to be not exempt, the Clerk is hereby authorized and directed to make application to the Approval Authority for approval of the aforementioned Amendment Number XX to the Livable Oakville Official Plan.

PASSED this \_\_ day of \_\_\_\_\_, 2021

\_\_\_\_\_  
MAYOR

\_\_\_\_\_  
CLERK

Town of Oakville By-law No. XX-2021

**AMENDMENT NO. XXX TO THE OFFICIAL PLAN**

**LANDS MUNICIPALLY KNOWN IN THE YEAR 2021 AS 530, 550, 588 Kerr Street, and 131, 171 Speers Road**

The Official Plan of the Town of Oakville is amended as follows:

1. Repealing and replacing Official Plan Policies 23.7.1 and 23.8.2 a) with the following policies to apply to the lands identified in Schedule A:
  - a. The overall development of the lands shall be in accordance with a Comprehensive Development Plan attached in Schedule A. The Comprehensive Development Plan is conceptual and the precise location and dimensions of blocks, buildings, open spaces and streets may vary through site specific development applications.
  - b. Area Policies

The following policies apply to the comprehensive development on the areas identified in Schedule B:

- i. Area A
  - A maximum building height of 26 storeys is permitted as shown on Schedule C.
  - A maximum of FSI of 4.5 is permitted.
  - A minimum non-residential area of 500 m<sup>2</sup> is required.
  - At-grade animated frontages are encouraged where buildings front Kerr Street and Shepherd Road extension, as shown on Schedule A.
  - Active frontages and at-grade retail are required for portions of buildings fronting the proposed Shepherd Road extension, as shown on Schedule A.
- ii. Area B
  - A maximum building height of 24 storeys is permitted as shown on Schedule C.
  - A maximum FSI of 4.4 is permitted.
  - A minimum non-residential floor area of 950 m<sup>2</sup> is required.

## DRAFT OPA

- At-grade animated frontages are encouraged where buildings front Kerr Street and the private street, as shown on Schedule A.
- Active frontages and at-grade retail are encouraged for portions of buildings fronting the proposed Shepherd Road extension, as shown on Schedule A.
- Architecture treatment will be provided to ensure the buildings framing the streets and public space are human-scaled and the height and bulk of the building above 6 storeys is mitigated.
- Where the policies above conflict with any other Official Plan policies or urban design direction, the above shall prevail.

### iii. Area C

- A maximum building height of 28 storeys is permitted, as shown on Schedule C.
- A maximum FSI of 3.6 is permitted.
- A minimum non-residential gross floor area of 2000 m<sup>2</sup> is required.
- At-grade animated frontages are encouraged where buildings front midblock connections and private street, as shown on Schedule A.
- Active frontages and at-grade retail are required for portions of buildings fronting Kerr Street and Speers Road, as shown on Schedule A.

### iv. Area D

- A maximum building height of 23 storeys is permitted as shown on Schedule C.
- A maximum FSI of 2.3 is permitted.
- A minimum non-residential gross floor area of 500 m<sup>2</sup> is required.
- At-grade animated frontages are encouraged where buildings front private roads and the future St. Augustine Drive extension, as shown on Schedule A.
- Active frontages and at-grade retail are required for portions of buildings fronting Speers Road, as shown on Schedule A.

## DRAFT OPA

- v. All areas
- A minimum density of 1.5 FSI will be required within each of the Areas identified in Schedule B.
  - A maximum FSI of 3.4 of development is permitted for the lands outlined in Schedule B.
  - Increases up to 10 percent of the maximum **FSI** occupied uses permitted within each Area identified above, provided the maximum **FSI** occupied in all **buildings** provided on Areas A, B, C and D as shown on Schedule B does not exceed 3.4 FSI.
  - Tower floorplates will be no more than 770 m<sup>2</sup> with tower walls no longer than 40 metres.
  - Balconies will be permitted to encroach into any setback, stepback, or separation distance provisions.
  - Building podiums may be up to 8 storeys in height and a stepback will be provided at no higher than 6 storeys.
  - Parking structures above the first storey may be located to the full extent of the outer walls of the first storey with an architectural treatment wrapping the façade.

c. Parks and Open Space

- i. A one-acre public park shall be provided in the approximate centre of the development block, which will, in part, be located on the Area B, Area C, and Area D lands.
- ii. The parkland delivered through this redevelopment shall be dedicated to the Town of Oakville in a stratified form and is conceptually located in Schedule C.
- A total of 4,037 m<sup>2</sup> (1 acre) of park space shall be delivered, located on the each of Area B, Area C, and Area D lands, as conceptually shown on Schedule D.
  - Parkland may be delivered in a phased and interim manner across parcels B, C and D lands.
  - The precise location and configuration of the park space will be determined at the site-specific development application stage.
- iii. Publicly accessible pedestrian connections will be provided as identified on the Comprehensive Development Plan and as shown on Schedule D.

## DRAFT OPA

- d. Urban Square (POPS)
  - i. An urban square shall be provided at the northwest corner of Kerr Road and Speers Street, at a minimum area of 500 m<sup>2</sup>. The urban square location is conceptually shown on Schedule D.
- e. Streets and Parking
  - i. Shepherd Road and St Augustine Drive will be extended through the site as a public road and will be secured during the development application stage for Areas A, B, and D as shown on Schedule D.
  - ii. A private road, designed to Town of Oakville road standards, will provide internal access within Areas B, C, D as shown on Schedule D.
  - iii. A reduced parking ratio will be permitted on the development block to support policy objectives for increasing transit use and active transportation in Kerr Village, and will be established at the development application stage
  - iv. Underground parking for private use will be permitted below private roads that are internal to the development block and below the Park.
- f. A non-sensitive land use may be located adjacent to the rail corridor, located on the Area A and D lands.
- g. The development block shall be identified as a Class 4 area pursuant to the Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning (NPC 300) issued by the Ministry of the Environment and Climate Change.
- h. Redevelopment in accordance with a) and b), above, will only occur upon confirmation of adequate water and wastewater services, the suitability of the adjoining roads to accommodate traffic and the submission of a phasing plan.
- i. Redevelopment in accordance with a), above, will be subject to the urban design guidelines outlined in the *Livable by Design Manual Part A and Part B: Urban Design Direction for Kerr Village Growth Area*.

## DRAFT OPA

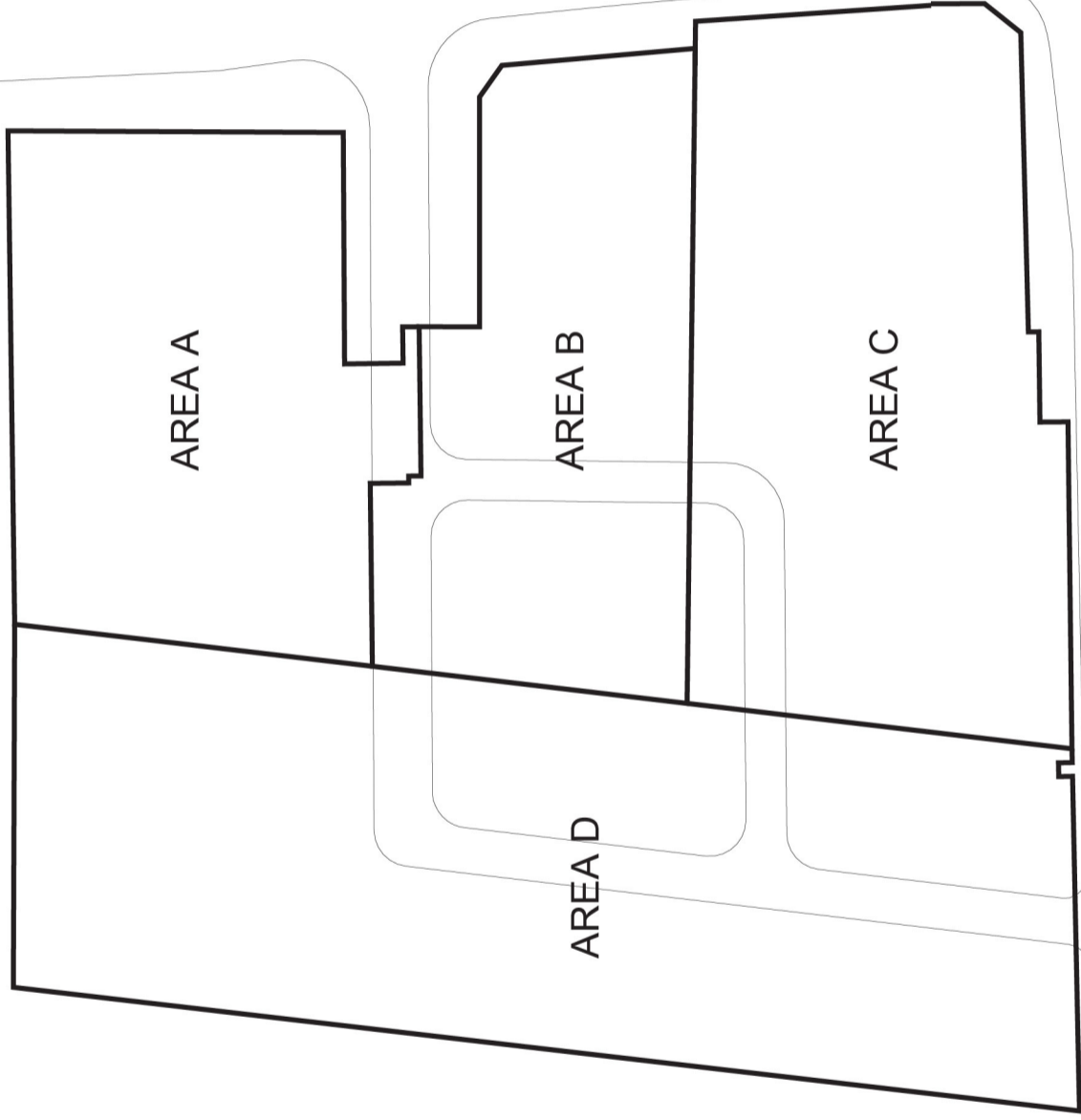
- j. Notwithstanding the above, the lands may continue to be used for the existing retail/commercial uses until such time as phased redevelopment across the site occurs.
- k. At the time of submission of a site-specific development application for any of the lands in Areas A, B, C, and D, a phasing plan is required that demonstrates how the development application can be realized without precluding the implementation of the overall development potential outlined in the Comprehensive Development Plan, the manner in which infrastructure and parkland will be provided and that there is no undue adverse impact on the continued operation of remaining existing uses.
- l. At the time of submission of a site-specific development application and as part of filing a complete application for development within any of the lands in Areas A,B,C, and D, the current and/or future owners of 530, 550, 588 Kerr Street, and 131, 171 Speers Road are required to become a party to the cost sharing agreement or provide the Town with an acknowledgement from a Trustee of a cost sharing agreement that the benefitting landowner has made satisfactory arrangements to pay its proportion of the shared development costs.
- m. Bonusing provisions to be added.





# Schedule B Development Blocks

CN RAILWAY



SHEPHERD ROAD

KERR STREET

SPEERS ROAD

530, 550, 588 Kerr Street  
& 131, 171 Speers Road

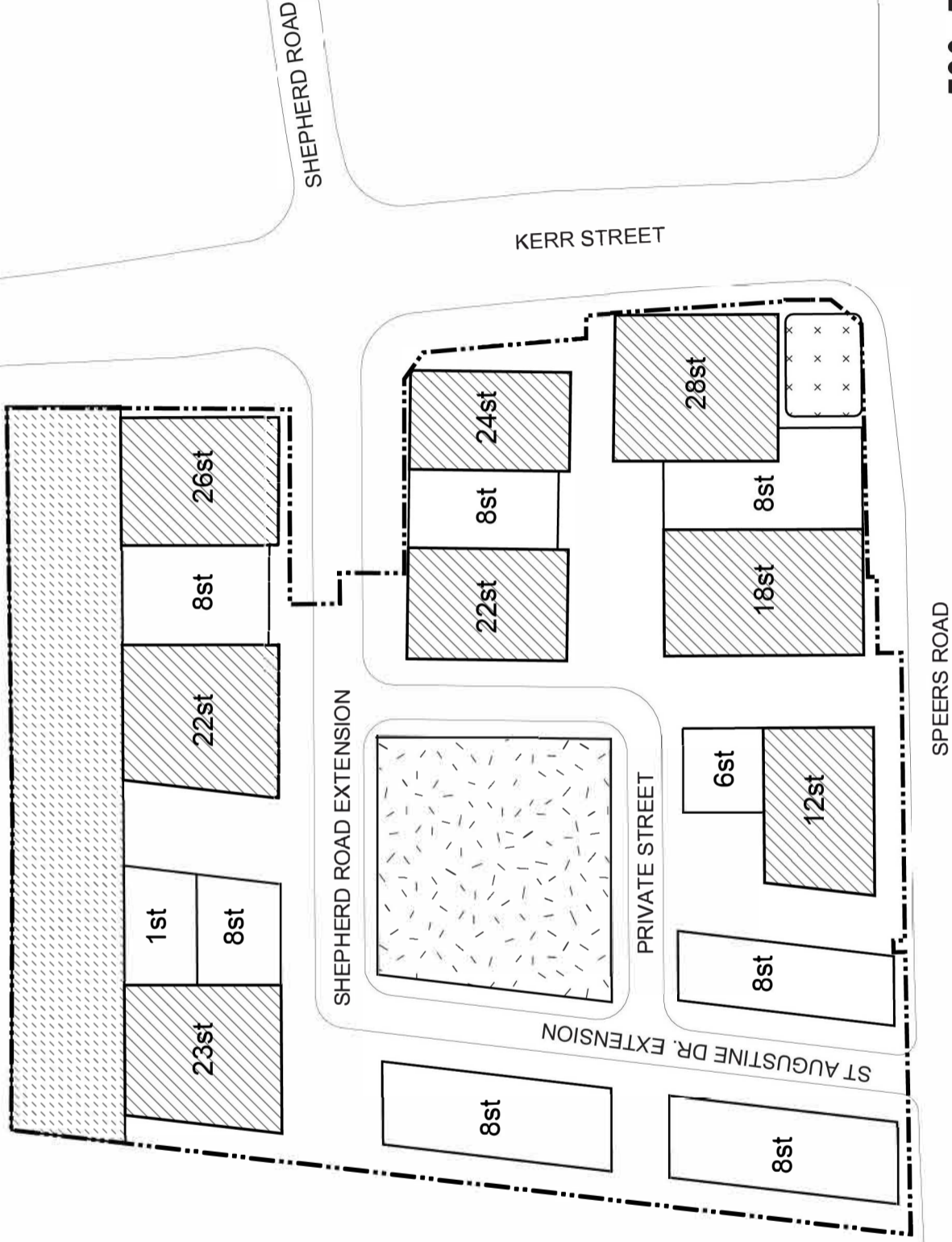
Legend

Development Blocks








# Schedule C Max Heights

CN RAILWAY



530, 550, 588 Kerr Street  
& 131, 171 Speers Road

## Legend

-  30m No Residential Zone
-  Open Space
-  Tower Zone
-  Podium Zone
-  Park



# Schedule D Parks and Open Space



### Legend

-  Park
-  Open Space

 Mid-block Connection



**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](http://oakvilletransit.ca) for information on schedules, fares and other services.

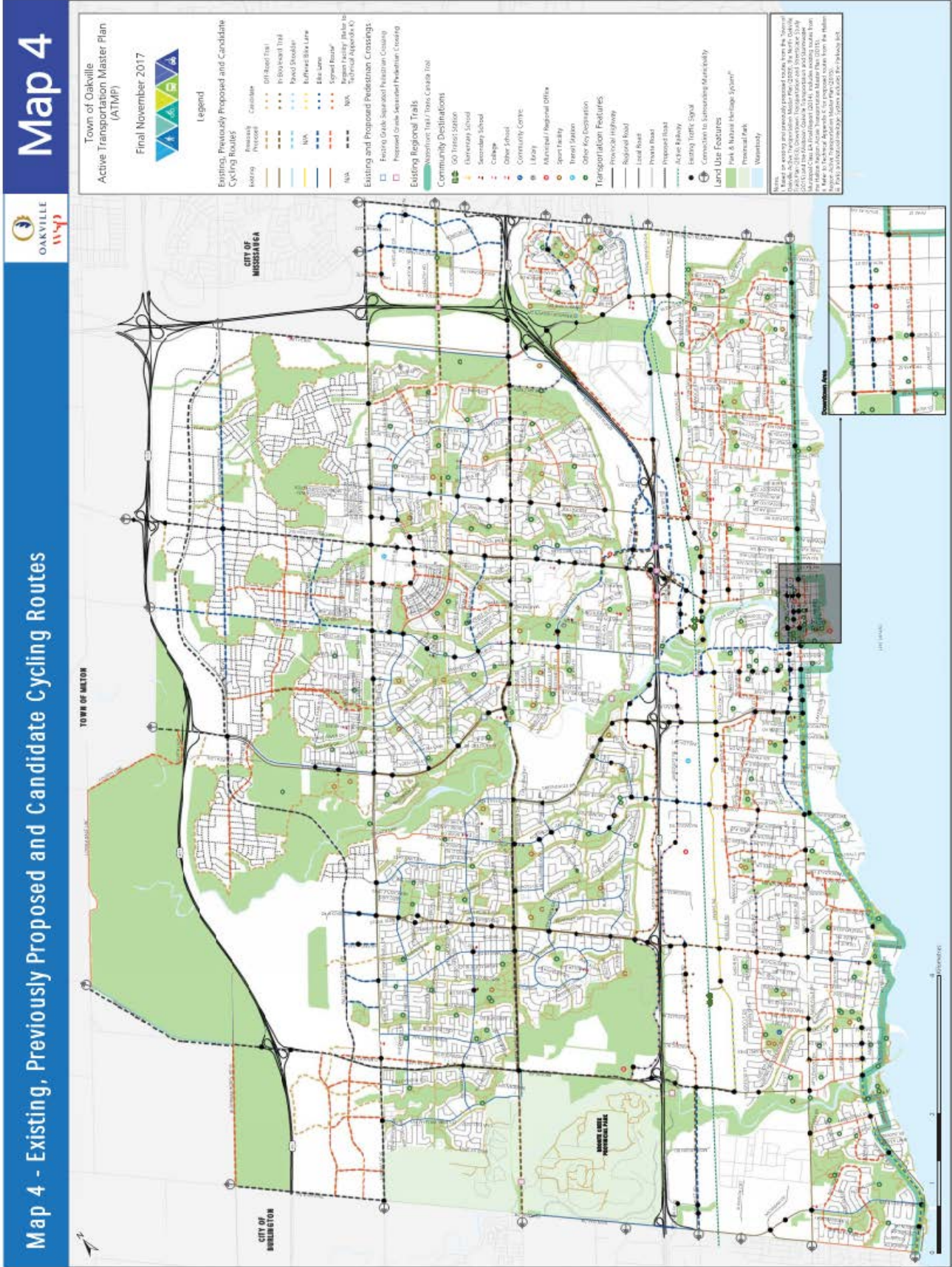
**APPENDIX G:  
Existing, Previously Proposed and Candidate Pedestrian and  
Cycling Routes – Town of Oakville Active Transportation  
Master Plan, Nov 2017**







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



**APPENDIX H:**  
**Subject Site Trip Generation and Modal Split Assumptions**

**RESIDENTIAL MULTI-MODAL TRIP GENERATION**

Land Use	Mode	AM		PM	
		In	Out	In	Out
Residential	Driver	57%	57%	67%	67%
	Passenger	13%	13%	13%	13%
	Transit	21%	21%	16%	16%
	Walk	7%	7%	4%	4%
	Cycle	1%	1%	0%	0%
<b>Total</b>		<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

**RETAIL MULTI-MODAL TRIP GENERATION**

Land Use	Mode	AM		PM	
		In	Out	In	Out
Retail	Driver	83%	83%	71%	71%
	Passenger	9%	9%	21%	21%
	Transit	3%	3%	4%	4%
	Walk	1%	1%	5%	5%
	Cycle	4%	4%	0%	0%
<b>Total</b>		<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

**RESIDENTIAL MULTI-MODAL TRIP GENERATION (With Adjusted Mode Split)**

Land Use	Mode	AM		PM	
		In	Out	In	Out
Residential	Driver	48%	48%	52%	52%
	Passenger	13%	13%	13%	13%
	Transit	26%	26%	26%	26%
	Walk	9%	9%	6%	6%
	Cycle	4%	4%	3%	3%
<b>Total</b>		<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

**RETAIL MULTI-MODAL TRIP GENERATION (With Adjusted Mode Split)**

Land Use	Mode	AM		PM	
		In	Out	In	Out
Retail	Driver	61%	61%	49%	49%
	Passenger	9%	9%	21%	21%
	Transit	20%	20%	20%	20%
	Walk	4%	4%	7%	7%
	Cycle	6%	6%	3%	3%
<b>Total</b>		<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

**RETAIL GROCERY VEHICLE TRIP GENERATION**

Proxy	AM		PM	
	In	Out	In	Out
ITE11th - LU820 Shopping Centre (General Urban/Suburban)				
Average rate	0.52	0.32	0.84	1.77
				3.40

**APPENDIX I:  
Capacity 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)
WBLR	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	<b>0.52 (0.54)</b>	<b>A (A)</b>	<b>0.34 (0.40)</b>	<b>A (A)</b>	<b>0.34 (0.39)</b>	<b>B (A)</b>	<b>0.35 (0.39)</b>	<b>B (A)</b>

#### 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	<b>0.74 (0.70)</b>	<b>C (C)</b>	<b>0.82 (0.72)</b>	<b>D (C)</b>	<b>0.83 (0.71)</b>	<b>D (C)</b>	<b>0.84 (0.73)</b>	<b>D (C)</b>

#### 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	<b>0.80 (0.87)</b>	<b>D (C)</b>	<b>0.87 (0.89)</b>	<b>D (D)</b>	<b>0.90 (0.91)</b>	<b>D (D)</b>	<b>0.94 (0.94)</b>	<b>D (D)</b>

#### 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	-- (-)	-- (-)	<b>0.32 (0.37)</b>	<b>A (A)</b>	<b>0.33 (0.37)</b>	<b>A (A)</b>	<b>0.33 (0.37)</b>	<b>A (A)</b>

#### 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	<b>0.45 (0.65)</b>	<b>B (B)</b>	<b>0.49 (0.65)</b>	<b>B (C)</b>	<b>0.49 (0.66)</b>	<b>B (C)</b>	<b>0.50 (0.67)</b>	<b>B (C)</b>

#### 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	<b>0.41 (0.51)</b>	<b>B (A)</b>	<b>0.45 (0.55)</b>	<b>B (A)</b>	<b>0.45 (0.54)</b>	<b>B (A)</b>	<b>0.45 (0.56)</b>	<b>B (A)</b>

#### 10 Dorval Road & Wyecroft 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 (0.96)	D (F)	0.60 (0.96)	D (F)	0.60 (0.96)	D (F)
EBTR	0.22 (0.29)	D (D)	0.22 (0.47)	D (D)	0.21 (0.49)	D (D)	0.21 (0.49)	D (D)
WBL	0.11 (0.19)	D (C)	0.11 (0.25)	D (D)	0.11 (0.25)	D (D)	0.10 (0.25)	D (D)
WBTR	0.37 (-)	D (-)	0.38 (-)	D (-)	0.43 (-)	D (-)	0.45 (-)	D (-)
WBT	-- (0.22)	-- (D)	-- (0.43)	-- (D)	-- (0.45)	-- (D)	-- (0.45)	-- (D)
WBR	-- (0.86)	-- (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	<b>0.60 (0.82)</b>	<b>C (D)</b>	<b>0.62 (0.88)</b>	<b>C (D)</b>	<b>0.64 (0.89)</b>	<b>C (D)</b>	<b>0.66 (0.91)</b>	<b>C (D)</b>

# 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)

**APPENDIX J:**  
**Capacity Analyses Worksheets – Synchro Analyses**

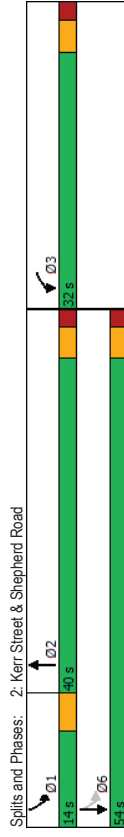


Upper Kerr Village (8/7/24-01) Existing AM  
 HCM Unsignalized Intersection Capacity Analysis  
 1: Kerr Street & Wycroft Road

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W	W	T	T	T	T
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			None	None	None	None
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					

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

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations	W	T	T	T
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	
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
<b>Intersection Summary</b>			

	WBL	WBR	NBT	NBR	SBL	SBT
Movement	W					
Lane Configurations	W					
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	0.95	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
Flt Protected						
Satd. Flow (prot)	1639	3366	3366	3484		3484
Flt Permitted	0.98		1.00			0.83
Satd. Flow (perm)	1639	3366	3366			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
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
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
<b>Intersection Summary</b>						
HCM 2000 Control Delay			9.0			HCM 2000 Level of Service A
HCM 2000 Volume to Capacity ratio			0.52			
Actuated Cycle Length (s)			41.2			Sum of lost time (s) 14.6
Intersection Capacity Utilization			62.8%			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

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

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

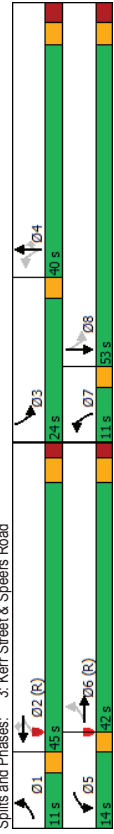
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	35	605	180	435	175	95	365	345
Traffic Volume (vph)	35	605	180	435	175	95	365	345
Future Volume (vph)	35	605	180	435	175	95	365	345
Turn Type	pm-pt	NA	pm-pt	NA	pm-pt	NA	pm-pt	NA
Protected Phases	1	6	5	2	2	7	4	8
Permitted Phases	6	2	2	2	2	4	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

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	122.7	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

# 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.

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

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.



3: Kerr Street & Speers Road

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	35	605	85	180	435	175	95	95	365	345	135	70
Traffic Volume (vph)	35	605	85	180	435	175	95	95	365	345	135	70
Future Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	3.0	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	3.0	6.3
Total Lost time (s)	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	0.99	1.00	1.00	0.96	1.00	1.00	0.93	1.00	0.98	1.00	0.98
Frbp_ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.97	1.00	0.97
Frt	1.00	0.98	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	1.00	0.95
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)	1795	3292	1686	3438	1495	1678	1844	1429	1671	1729	1729	1729
Flt Permitted	0.47	1.00	0.20	1.00	1.00	0.61	1.00	0.61	1.00	0.61	1.00	0.61
Satd. Flow (perm)	880	3292	354	3438	1495	1079	1844	1429	1070	1729	1729	1729
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)	41	703	99	209	506	203	110	110	424	401	157	81
RTOR Reduction (vph)	0	8	0	0	0	116	0	0	197	0	17	0
Lane Group Flow (vph)	41	794	0	209	506	87	110	110	227	401	221	0
Confl. Peds. (#/hr)	15	10	10	10	15	20	35	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	0	5	0	0	0
Turn Type	pm-pt	NA	pm-pt	NA	pm-pt	NA	pm-pt	NA	pm-pt	pm-pt	NA	NA
Protected Phases	1	6	5	2	2	7	4	4	3	8	8	8
Permitted Phases	6	44.4	60.0	51.2	51.2	31.4	23.5	23.5	47.8	36.9	36.9	36.9
Actuated Green, G (s)	50.2	44.4	60.0	51.2	51.2	31.4	23.5	23.5	47.8	36.9	36.9	36.9
Effective Green, g (s)	0.42	0.37	0.50	0.43	0.43	0.26	0.20	0.20	0.40	0.31	0.31	0.31
Actuated G/C Ratio	3.0	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	3.0	6.3
Clearance Time (s)	2.5	5.5	2.5	5.5	5.5	2.5	4.0	4.0	2.5	4.0	2.5	4.0
Vehicle Extension (s)	412	1218	316	1466	637	321	361	279	532	531	531	531
Lane Grp Cap. (vph)	0.00	0.24	c0.07	0.15	0.02	0.06	0.02	0.06	c0.13	0.13	0.13	0.13
v/s Ratio Prot	0.04	c0.26	0.35	0.14	0.34	0.30	0.81	0.75	0.42	0.42	0.42	0.42
v/s Ratio Perm	2.08	31.4	19.7	23.1	20.9	35.0	41.3	46.2	28.8	33.0	33.0	33.0
Uniform Delay, d1	0.91	0.84	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	0.1	2.2	4.6	0.6	0.4	0.5	0.7	17.2	5.7	0.7	0.7	0.7
Incremental Delay, d2	19.0	28.4	24.3	23.8	21.4	35.5	41.9	63.3	34.5	33.7	33.7	33.7
Delay (s)	B	C	C	C	C	D	D	E	C	C	C	C
Level of Service	B	C	C	C	C	D	D	E	C	C	C	C
Approach Delay (s)	28.0	C	23.4	C	C	D	D	54.9	C	C	C	34.2
Approach LOS	C	C	C	C	C	D	D	D	C	C	C	C
Intersection Summary	HCM 2000 Control Delay: 33.6 HCM 2000 Level of Service: C HCM 2000 Volume to Capacity ratio: 0.74 Actuated Cycle Length (s): 120.0 Sum of lost time (s): 18.2 Intersection Capacity Utilization: 81.4% ICU Level of Service: D Analysis Period (min): 15 Critical Lane Group:											

4: Dorval Road & Speers Road

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	415	485	75	300	180	70	720	240	450	255	255	255
Traffic Volume (vph)	415	485	75	300	180	70	720	240	450	255	255	255
Future Volume (vph)	415	485	75	300	180	70	720	240	450	255	255	255
Ideal Flow (vphpl)	7	4	3	8	8	2	6	6	6	6	6	6
Total Lost time (s)	7	4	3	8	8	2	6	6	6	6	6	6
Lane Util. Factor	7	4	3	8	8	2	6	6	6	6	6	6
Frbp_ped/bikes	7.0	10.0	7.0	10.0	10.0	7.0	20.0	7.0	20.0	20.0	20.0	20.0
Frt	11.0	42.0	11.0	42.0	42.0	11.0	40.0	11.0	40.0	40.0	40.0	40.0
Flt Protected	24.0	49.0	17.0	42.0	42.0	11.0	41.0	13.0	43.0	43.0	43.0	43.0
Satd. Flow (prot)	20.0%	40.8%	14.2%	35.0%	35.0%	9.2%	34.2%	10.8%	35.8%	35.8%	35.8%	35.8%
Flt Permitted	20.0	42.0	13.0	35.0	35.0	7.0	34.0	9.0	36.0	36.0	36.0	36.0
Satd. Flow (perm)	3.0	4.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0
Peak-hour factor, PHF	1.0	3.0	1.0	3.0	3.0	1.0	3.0	1.0	3.0	3.0	3.0	3.0
Adj. Flow (vph)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RTOR Reduction (vph)	4.0	7.0	4.0	7.0	7.0	4.0	7.0	4.0	7.0	7.0	7.0	7.0
Lane Group Flow (vph)	4.0	7.0	4.0	7.0	7.0	4.0	7.0	4.0	7.0	7.0	7.0	7.0
Confl. Peds. (#/hr)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Heavy Vehicles (%)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Bus Blockages (#/hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	None	None	None	None	None	None	None	None	None	None	None	None
Protected Phases	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Permitted Phases	28.0	28.0	28.0	28.0	28.0	28.0	26.0	26.0	26.0	26.0	26.0	26.0
Actuated Green, G (s)	5	5	5	5	5	5	5	5	5	5	5	5
Effective Green, g (s)	5.0	3.0	5.0	5.0	5.0	3.0	5.0	3.0	5.0	5.0	5.0	5.0
Actuated G/C Ratio	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Clearance 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
Vehicle Extension (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
Lane Grp Cap. (vph)	None	None	None	None	None	None	None	None	None	None	None	None
v/s Ratio Prot	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
v/s Ratio Perm	28.0	28.0	28.0	28.0	28.0	28.0	26.0	26.0	26.0	26.0	26.0	26.0
Uniform Delay, d1	5	5	5	5	5	5	5	5	5	5	5	5
Progression Factor	None	None	None	None	None	None	None	None	None	None	None	None
Incremental Delay, d2	28.0	28.0	28.0	28.0	28.0	28.0	26.0	26.0	26.0	26.0	26.0	26.0
Delay (s)	5	5	5	5	5	5	5	5	5	5	5	5
Level of Service	5	5	5	5	5	5	5	5	5	5	5	5
Approach Delay (s)	28.0	28.0	28.0	28.0	28.0	28.0	26.0	26.0	26.0	26.0	26.0	26.0
Approach LOS	C	C	C	C	C	C	D	D	C	C	C	C
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: 115 Control Type: Actuated-Coordinated Splits and Phases: 4: Dorval Road & Speers Road 13 s (D1), 17 s (D2), 17 s (D3), 17 s (D4), 11 s (D5), 11 s (D6), 24 s (D7), 42 s (D8)											

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
<b>Intersection Summary</b>										
#	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	T	T	T	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	
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	0.13	0.14	0.14	0.14
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	B	B	B
<b>Intersection Summary</b>										
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 (8/7/24-01)

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

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)	5	740	15	0	590	15	0	0	20	0	0	0
Future Volume (Veh/h)	5	740	15	0	590	15	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							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							None					
Median storage (veh)												
Upstream signal (m)							236					
pX, platoon unblocked	0.92						0.92	0.92	0.92	0.92	0.92	0.92
VC, conflicting volume	692			863			1202	1558	434	1139	1558	348
VC1, stage 1 conf vol												
VC2, stage 2 conf vol												
VCU, unblocked vol	481			863			1037	1427	434	969	1427	106
IC, single (s)	4.1			4.1			7.5	6.5	7.0	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
IC queue free %	99			100			100	100	96	100	100	100
IC capacity (veh/h)	996			784			170	123	559	182	123	852
Direction_Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1	SB 1					
Volume Total	6	561	297	447	240	23	0					
Volume Left	6	0	0	0	0	0	0					
Volume Right	0	0	17	0	17	23	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	0.0	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			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	WBT	SBL	SBR
Lane Configurations	4	4	4	4	4	4
Traffic Volume (vph)	185	1125	540	5	220	220
Future Volume (vph)	185	1125	540	5	220	220
Turn Type	pm-pt	NA	NA	Prot	Perm	Perm
Protected Phases	5	2	2	6	4	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%	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:WBTL Start of Green						
Natural Cycle: 60						
Control Type: Actuated-Coordinated						
Splits and Phases: 6: Speers Road/Cornwall Road & Cross Avenue						
→ D2 (R)	→ D4					
← D5	← D6 (R)					
53 s	31 s					

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)

Movement	EBL	EBT	WBT	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔
Traffic Volume (vph)	185	1125	540	20	5
Future Volume (vph)	185	1125	540	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	3447	1805	2608
Flt Permitted	0.37	1.00	1.00	0.95	1.00
Satd. Flow (perm)	656	3471	3447	1805	2608
Peak-Hour factor, PHF	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	218	1324	635	24	6
RTOR Reduction (vph)	0	0	1	0	0
Lane Group Flow (vph)	218	1324	658	0	19
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	102.0	10.3	10.3
Effective Green, g (s)	117.3	117.3	102.0	10.3	10.3
Actuated g/C Ratio	0.84	0.84	0.73	0.07	0.07
Clearance Time (s)	6.0	6.6	6.6	5.8	5.8
Vehicle Extension (s)	3.5	5.0	5.0	3.0	3.0
Lane Grp Cap (vph)	617	2908	2511	132	191
v/s Ratio Prot	0.02	c0.38	0.19	0.00	
v/c Ratio Perm	0.27			c0.01	
v/c Ratio	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				
Intersection Capacity Utilization	68.1%		Sum of lost time (s)		18.4
Analysis Period (min)	15		ICU Level of Service		C
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												
Traffic Volume (veh/h)	5	0	5	5	0	40	5	510	5	40	345	5
Future Volume (Veh/h)	5	0	5	5	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	6	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	SB 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%									B
Analysis Period (min)			15									

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
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			
						A

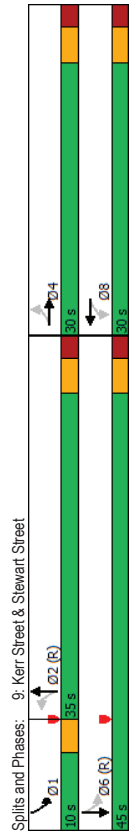


Timings 9: Kerr Street & Stewart Street

Existing AM 9: Kerr Street & Stewart Street

	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	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	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	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							

	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)	463	564	1156	1025
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	0.26	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	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	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 &amp; Wyecroft Road</p> <p>Phase 1: 17 s (L), Phase 2: 17 s (R), Phase 3: 21 s (L), Phase 4: 21 s (R), Phase 5: 17 s (L), Phase 6: 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	2	2	2	2	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	2	2	2	2	2	1	6	6
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	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	2	2	2	1	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 &amp; Wyecroft Road</p> <p>Phase 1: 17 s (L), Phase 2: 17 s (R), Phase 3: 21 s (L), Phase 4: 21 s (R), Phase 5: 17 s (L), Phase 6: 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	672.1			
Internal Link Dist (m)	115.0			65.0	125.0			
Turn Bay Length (m)	416	928	351	1020	259	2309	379	2238
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	0.34	0.46	0.55	0.42	0.65
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	TT	TT	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	0.99	1.00	1.00
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	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								
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	WB	WB	WB	WB	WB	WB
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%			
Analysis Period (min)			15			
						B

Timings  
 2. Kerr Street & Shepherd Road

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

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations	WB	WB	WB	WB
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	
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-Uncooord				
Splits and Phases: 2: Kerr Street & Shepherd Road				

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)

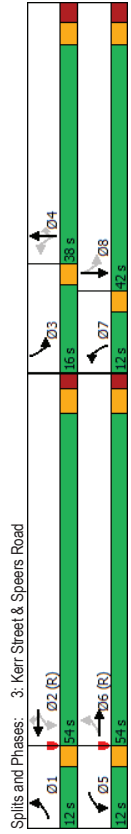
	WBL	NBT	SBT
Lane Group	242	676	583
Lane Group Flow (vph)	0.47	0.41	0.62
v/c Ratio	11.9	7.7	9.7
Control Delay	0.0	0.0	0.0
Queue Delay	11.9	7.7	9.7
Total Delay	7.6	12.8	12.6
Queue Length 50th (m)	25.5	26.3	27.4
Queue Length 95th (m)	241.3	143.2	2.5
Internal Link Dist (m)			
Turn Bay Length (m)	1104	2888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

	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	
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	
<b>Intersection Summary</b>						
HCM 2000 Control Delay			8.4			HCM 2000 Level of Service A
HCM 2000 Volume to Capacity ratio			0.54			
Actuated Cycle Length (s)			41.7			Sum of lost time (s) 14.6
Intersection Capacity Utilization			63.1%			ICU Level of Service 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 (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.9	3.0	5.9	5.9	3.0	6.3	6.3	3.0	6.3	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	1.00
Fpb. ped/bikes	1.00	0.99	1.00	1.00	0.94	1.00	1.00	0.93	1.00	0.99	1.00	0.99
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.97
Satd. Flow (prot)	1797	3392	1750	3539	1485	1768	1877	1486	1750	1816	1750	1816
Flt Permitted	0.32	1.00	0.33	1.00	1.00	0.36	1.00	0.36	1.00	0.51	1.00	0.51
Satd. Flow (perm)	601	3392	611	3539	1485	1768	1877	1486	1750	1816	1750	1816
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	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	3	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	pm-pt	NA	pm-pt	NA	pm-pt	NA	pm-pt	pm-pt	NA	NA
Protected Phases	1	6	5	2	2	7	4	4	3	8	8	8
Permitted Phases	6	52.4	68.5	59.4	59.4	30.8	20.9	20.9	39.3	26.4	26.4	26.4
Actuated Green, G (s)	58.5	52.4	68.5	59.4	59.4	30.8	20.9	20.9	39.3	26.4	26.4	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	26.4	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	0.22	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	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	2.5	4.0
Lane Grp Cap. (vph)	353	1481	473	1751	735	263	326	258	411	399	399	399
v/s Ratio Prot	0.01	0.17	c0.07	0.22	0.05	0.08	0.05	0.08	c0.09	c0.17	c0.17	c0.17
v/s Ratio Perm	0.08	c0.29	0.17	0.10	0.10	0.03	0.03	0.03	0.14	0.14	0.14	0.14
v/c Ratio	0.18	0.40	0.63	0.45	0.35	0.56	0.45	0.45	0.16	0.69	0.76	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	43.8	43.8
Progression Factor	0.73	0.89	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.7	2.4	0.8	1.3	2.1	1.4	0.4	4.6	8.4	8.4	8.4
Delay (s)	12.2	21.3	16.7	20.5	19.8	38.5	45.8	42.5	37.2	52.2	52.2	52.2
Level of Service	B	C	B	C	B	D	D	D	D	D	D	D
Approach Delay (s)	20.4	C	19.6	B	B	42.3	D	D	45.0	D	D	D
Approach LOS	C	C	B	B	B	D	D	D	D	D	D	D
Intersection Summary	<p>HCM 2000 Control Delay: 27.7 HCM 2000 Level of Service: C</p> <p>HCM 2000 Volume to Capacity ratio: 0.70</p> <p>Actuated Cycle Length (s): 120.0 Sum of lost time (s): 18.2</p> <p>Intersection Capacity Utilization: 83.1% ICU Level of Service: E</p> <p>Analysis Period (min): 15</p>											
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	375	375
Future Volume (vph)	415	410	195	560	455	65	530	240	595	375	375	375
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7	4	3	8	8	2	6	6	1	6	6	6
Lane Util. Factor	7	4	3	8	8	2	6	6	1	6	6	6
Fpb. ped/bikes	7	4	3	8	8	2	6	6	1	6	6	6
Fpb. ped/bikes	7	4	3	8	8	2	6	6	1	6	6	6
Flt Protected	7.0	10.0	7.0	10.0	10.0	7.0	20.0	7.0	20.0	20.0	20.0	20.0
Satd. Flow (prot)	11.0	42.0	11.0	42.0	42.0	11.0	40.0	11.0	40.0	40.0	40.0	40.0
Flt Permitted	24.0	47.0	19.0	42.0	42.0	11.0	41.0	13.0	43.0	43.0	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%	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	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	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	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)	4.0	7.0	4.0	7.0	7.0	4.0	7.0	4.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lag	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	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)	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	<p>Cycle Length: 120</p> <p>Actuated Cycle Length: 120</p> <p>Offset: 17 (14%), Referenced to phase 2,NBTL and 6,SBTL, Start of Green</p> <p>Natural Cycle: 105</p> <p>Control Type: Actuated-Coordinated</p>											
Spits and Phases:	<p>4: Dorval Road &amp; Speers Road</p> <p>Phase 1: 11 s, Phase 2: 43 s, Phase 3: 24 s, Phase 4: 47 s, Phase 5: 19 s, Phase 6: 27 s, Phase 7: 19 s, Phase 8: 47 s</p>											

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.								
~	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

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

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	FF	FF	FF	FF	FF	FF	FF	FF	FF
Traffic Volume (vph)	415	410	50	195	560	455	65	530	75
Future Volume (vph)	415	410	50	195	560	455	65	530	75
Ideal Flow (vphpl)	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
Lane Util. Factor	0.97	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Fpb. ped/bikes	1.00	1.00	1.00	0.98	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	0.98	1.00	1.00	0.85	1.00	0.98	1.00	1.00
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3492	1785	3546	1572	1805	3507	1787	3574
Flt Permitted	0.95	1.00	0.46	1.00	1.00	0.34	1.00	0.22	1.00
Satd. Flow (perm)	3433	3492	863	3546	1572	648	3507	408	3574
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)	451	446	54	212	609	495	71	576	82
RTOR Reduction (vph)	0	0	0	0	134	0	9	0	0
Lane Group Flow (vph)	451	492	0	212	609	361	71	649	0
Confl. Peds. (#/hr)	5	5	5	5	5	5	5	5	5
Heavy Vehicles (%)	2%	2%	1%	1%	1%	0%	1%	1%	1%
Bus Blockages (#/hr)	0	2	0	0	4	0	0	0	0
Turn Type	Prot	NA	NA	pm-pt	NA	pm-pt	NA	pm-pt	NA
Protected Phases	7	4	3	8	8	5	2	1	6
Permitted Phases	8	8	8	8	2	2	6	6	6
Actuated Green, G (s)	19.2	39.1	45.9	32.9	39.7	34.0	49.9	40.2	40.2
Effective Green, g (s)	19.2	39.1	45.9	32.9	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	0.42	0.34
Clearance Time (s)	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0	4.0
Vehicle Extension (s)	3.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0	3.0
Lane Grp Cap (vph)	549	1137	429	972	430	269	993	306	1197
v/s Ratio Prot	c0.13	0.14	0.05	0.17	0.01	0.18	c0.08	0.18	0.09
v/s Ratio Perm	0.14	0.14	0.23	0.07	0.07	0.27	0.27	0.27	0.26
v/c Ratio	0.82	0.43	0.49	0.63	0.84	0.26	0.65	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
Progression Factor	1.00	1.00	0.90	0.85	0.73	1.00	1.00	1.48	0.48
Incremental Delay, d2	9.6	0.6	0.9	1.7	14.2	0.5	3.3	15.3	1.3
Delay (s)	58.3	32.3	24.1	34.1	44.1	28.6	41.2	53.8	16.7
Level of Service	E	C	C	C	D	C	D	D	B
Approach Delay (s)	44.6	36.2	39.9	39.9	39.9	39.9	20.7	20.7	20.7
Approach LOS	D	D	D	D	D	D	C	C	C
Intersection Summary									
HCM 2000 Control Delay	34.0								
HCM 2000 Volume to Capacity ratio	0.87								
Actuated Cycle Length (s)	120.0								
Intersection Capacity Utilization	78.1%								
Analysis Period (min)	15								
c. Critical Lane Group	D								



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

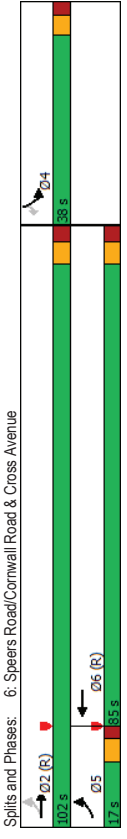
Timings  
 6. Speers Road/Cornwall Road & Cross Avenue

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	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
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
Right turn flare (veh)												
Median type												
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked	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											

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						



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

7: Kerr Street & Prince Charles Drive

8: Kerr Street & Elmwood Road

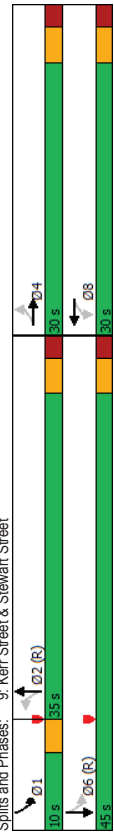
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4		4				4			4	
Traffic Volume (veh/h)	10	0	10	10	0	30	5	475	10	20	605	25
Future Volume (Veh/h)	10	0	10	10	0	30	5	475	10	20	605	25
Sign Control	Stop	Stop	Free	Stop	Stop	Free	0%	Free	0%	Free	0%	Free
Grade	0%	0%	0%	0%	0%	0%	0%	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	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)												
Median type								None				None
Median storage (veh)												
Upstream signal (m)								238				127
pX platoon unblocked	0.78	0.78	0.76	0.78	0.78	0.96	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												
vCv, 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
iF (s)	3.5	4.5	3.3	3.5	4.0	3.3	2.4					2.2
p0 queue free %	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	NB 1	SB 1	SB 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	35					
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	0.87	0.83	0.83			
vC, conflicting volume	1156	651	672			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCv, unblocked vol	895	472	497			
iC, single (s)	6.4	6.3	4.3			
iF (s)	3.5	3.4	2.4			
p0 queue free %	94	98	99			
CM capacity (veh/h)	261	461	783			
Direction_Lane #	EB 1	NB 1	SB 1	SB 1	SB 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 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
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	4	8	8	2	2	1	6	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	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
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 Existing PM Upper Kerr Village (8/24-01)

	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

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	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			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				0.99	
Fpb. ped/bikes	0.98			1.00				1.00				1.00	
Ft	0.97			0.90				0.99				0.99	
Flt Protected	0.97			0.99				1.00				1.00	
Satd. Flow (prot)	1661			1562				1852				1799	
Flt Permitted	0.77			0.97				0.98				0.93	
Satd. Flow (perm)	1323			1518				1825				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	380	16	60	495	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	406	0	0	606	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		2	1	6		
Permitted Phases	4			8			2		2	1	6		
Actuated Green, G (s)	13.2			13.2			51.0		51.0	51.0	51.0	51.0	
Effective Green, g (s)	13.2			13.2			51.0		51.0	51.0	51.0	51.0	
Actuated G/C Ratio	0.18			0.18			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	
Vehicle Extension (s)	4.0			4.0			4.0		4.0	4.0	4.0	4.0	
Lane Grp. Cap. (vph)	232			267			1241		1241	1141	1141	1141	
v/s Ratio Prot													
v/s Ratio Perm	c0.05			0.03			0.22		0.22	c0.36	c0.36	c0.36	
v/c Ratio	0.29			0.16			0.33		0.33	0.53	0.53	0.53	
Uniform Delay, d1	26.8			26.2			4.9		4.9	6.0	6.0	6.0	
Progression Factor	1.00			1.00			1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.0			0.4			0.7		0.7	0.5	0.5	0.5	
Delay (s)	27.8			26.5			5.6		5.6	6.5	6.5	6.5	
Level of Service	C			C			A		A	A	A	A	
Approach Delay (s)	27.8			26.5			5.6		5.6	6.5	6.5	6.5	
Approach LOS	C			C			A		A	A	A	A	
Intersection Summary													
HCM 2000 Control Delay	9.4			HCM 2000 Level of Service									A
HCM 2000 Volume to Capacity ratio	0.51												
Actuated Cycle Length (s)	75.0			Sum of lost time (s)									13.8
Intersection Capacity Utilization	77.5%			ICU Level of Service									D
Analysis Period (min)	15												
c Critical Lane Group													

10: Donval Road & Wycroft 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	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	4	3	8	8	5	2	1	6
Permitted Phases	7	4	3	8	8	5	2	1	6
Detector Phase									
Switch Phase									
Minimum Initial (s)	7.0	10.0	7.0	10.0	10.0	7.0	20.0	7.0	20.0
Minimum Split (s)	12.0	25.0	12.0	25.0	25.0	12.0	41.0	12.0	41.0
Total Split (s)	21.0	40.0	21.0	40.0	40.0	17.0	42.0	17.0	42.0
Total Split (%)	17.5%	33.3%	17.5%	33.3%	33.3%	14.9%	35.0%	14.9%	35.0%
Maximum Green (s)	16.0	33.0	16.0	33.0	33.0	12.0	35.0	12.0	35.0
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	2.0	3.0	2.0	3.0	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
Total Lost Time (s)	5.0	7.0	5.0	7.0	7.0	5.0	7.0	5.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	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
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	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									



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	HT	HT	HT	F	F	F	F	F	F	HT	HT	HT
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	0.91
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	
Permitted Phases				8		8		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)	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 G/C Ratio	0.14	0.34	0.31	0.25	0.25	0.41	0.33	0.08	0.33	0.08	0.33	0.33
Clearance Time (s)	5.0	7.0	5.0	7.0	7.0	5.0	7.0	5.0	7.0	5.0	7.0	7.0
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)	455	1085	337	436	398	198	1654	271	1616	271	1616	1616
v/s Ratio Prot	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 Perm			0.05		c0.22	0.17						
v/c Ratio	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		41.7
Approach LOS		D		E		C		D		D		D

Intersection Summary	
HCM 2000 Control Delay	42.9
HCM 2000 Volume to Capacity ratio	0.82
Actuated Cycle Length (s)	120.0
Sum of lost time (s)	24.0
Intersection Capacity Utilization	84.4%
ICU Level of Service	E
Analysis Period (min)	15
Critical Lane Group	

### 1: Kerr Street & Wyeocort Road

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

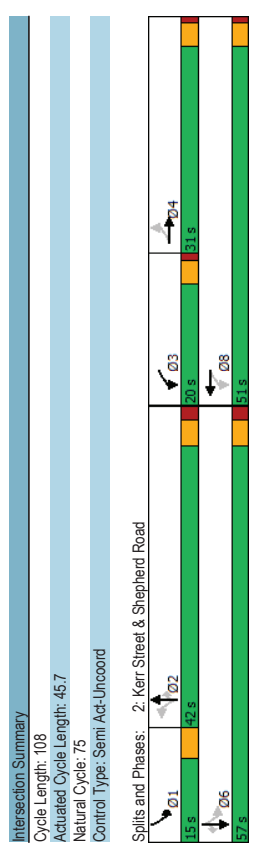
### HCM Unsynchronized Intersection Capacity Analysis

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	5	80	170	335	500	125
Future Volume (Veh/h)	5	80	170	335	500	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	181	356	532	133
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)			None	None	None	None
Median type						
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	1138	332	665			
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	1138	332	665			
IC, single (s)	6.8	7.0	4.1			
IC, 2 stage (s)	3.5	3.3	2.2			
p0 queue free %	97	87	80			
CM capacity (veh/h)	159	660	920			
Direction_Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1 SB 2
Volume Total	5	85	181	178	178	355 310
Volume Left	5	0	181	0	0	0 0
Volume Right	0	85	0	0	0	0 133
cSH	159	660	920	1700	1700	1700
Volume to Capacity	0.03	0.13	0.20	0.10	0.10	0.21 0.18
Queue Length 95th (m)	0.7	3.3	5.5	0.0	0.0	0.0 0.0
Control Delay (s)	28.4	11.3	9.9	0.0	0.0	0.0 0.0
Lane LOS	D	B	A	A	A	A A
Approach Delay (s)	12.2		3.3			0.0
Approach LOS	B					
Intersection Summary						
Average Delay	2.2					
Intersection Capacity Utilization	40.6%					
Analysis Period (min)	15					

### 2: Kerr Street & Shepherd Road

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

Lane Group	WBL	WBT	NBT	NBR	SBL	SBT	Ø4
Lane Configurations	↔	↔	↔	↔	↔	↔	
Traffic Volume (vph)	120	0	280	65	90	435	
Future Volume (vph)	120	0	280	65	90	435	
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	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	5	0
Intersection Summary							
Cycle Length: 108							
Actual Cycle Length: 45.7							
Natural Cycle: 75							
Control Type: Semi Ad-Uncoordinated							



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					
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)

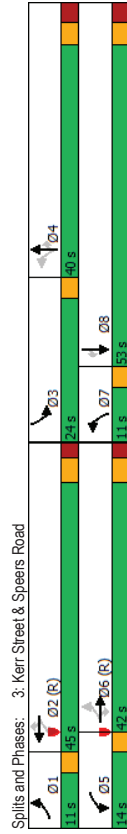
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Traffic Volume (vph)	0	0	0	120	0	215	0	280	65	90	435	0
Future Volume (vph)	0	0	0	120	0	215	0	280	65	90	435	0
Ideal Flow (vphpb)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0 4.0			5.2 5.2			4.0 4.0			5.2 5.2		
Lane Util. Factor	1.00 1.00			1.00 1.00			0.95 1.00			1.00 0.95		
Fpb. ped/bikes	1.00 0.98			1.00 0.98			1.00 0.97			1.00 1.00		
Ft	1.00 0.85			1.00 0.85			1.00 0.85			1.00 1.00		
Flt Protected	0.95 1.00			0.95 1.00			1.00 1.00			0.95 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			0.91 0.92			0.91 0.91			0.91 0.91		
Adj. Flow (vph)	0 0			132 0			236 0			308 71		
RTOR Reduction (vph)	0 0			0 177			0 0			0 44		
Lane Group Flow (vph)	0 0			132 59			0 0			308 27		
Confl. Peds. (#/hr)	2%			2%			8%			2%		
Heavy Vehicles (%)	2%			2%			0%			2%		
Bus Blockages (#/hr)	0 0			0 0			0 0			6 0		
Turn Type	Perm	pm-pt	NA	Perm	NA	Perm	NA	Perm	pm-pt	NA	Perm	
Protected Phases	4			3 8			2 2			1 6		
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	12.6			12.6			19.4			19.4		
Effective Green, g (s)	12.6			12.6			19.4			19.4		
Actuated G/C Ratio	0.25			0.25			0.38			0.57		
Clearance Time (s)	4.0			4.0			5.2			4.0		
Vehicle Extension (s)	3.0			3.0			3.5			2.5		
Lane Grp Cap (vph)	373			396			1343			575		
v/s Ratio Prot	c0.05			c0.04			0.09			c0.14		
v/s Ratio Perm	c0.04			c0.04			0.02			0.08		
v/c Ratio	0.35			0.15			0.23			0.17		
Uniform Delay, d1	15.5			14.8			10.5			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)	16.0			14.9			10.6			9.8		
Level of Service	B			B			B			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			A		
HCM 2000 Volume to Capacity ratio	0.34											
Actuated Cycle Length (s)	50.5			Sum of lost time (s)			17.2			B		
Intersection Capacity Utilization	56.0%			ICU Level of Service			B			c		
Analysis Period (min)	15											
Critical Lane Group												



Timings 3: Kerr Street & Speers 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	4	4	4	4	4	4	4	4	4	4	4	4
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
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	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 Background AM 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	826	99	227	628	221	116	145	430	407	186	105
v/c Ratio	0.13	0.72	0.18	0.75	0.45	0.30	0.28	0.33	0.91	0.79	0.30	0.18
Control Delay	15.2	31.5	4.4	38.5	29.6	4.9	20.6	38.1	50.3	60.3	29.7	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	15.2	31.5	4.4	38.5	29.6	4.9	20.6	38.1	50.3	60.3	29.7	5.2
Queue Length 50th (m)	3.6	98.7	1.5	32.3	60.7	0.0	14.7	27.0	61.3	47.7	30.6	0.0
Queue Length 95th (m)	9.7	119.0	5.6	#63.5	77.6	14.1	23.0	41.9	#98.3	60.5	44.2	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)	384	1154	564	301	1399	739	416	517	522	583	718	652
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	0.12	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.



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
<b>Intersection Summary</b>											
#	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	T	TT	TT	T	TT	TT	TT	TT	T
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	0.41	0.71	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
<b>Intersection Summary</b>											
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

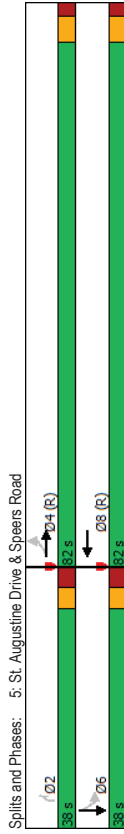
Queues  
5. St. Augustine Drive & Speers Road

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

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

Lane Group	EBL	EBT	WBT	NBR	Ø6
Lane Configurations	5	4	4	2	Ø6
Traffic Volume (vph)	850	720	20	20	
Future Volume (vph)	850	720	20	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	983	835	23
v/c Ratio	0.01	0.31	0.27	0.11
Control Delay	1.6	1.4	4.7	1.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	1.6	1.4	4.7	1.1
Queue Length 50th (m)	0.1	13.6	45.6	0.0
Queue Length 95th (m)	m0.3	m20.4	52.3	0.0
Internal Link Dist (m)		472.1	42.5	
Turn Bay Length (m)	50.0			
Base Capacity (vph)	583	3124	3122	519
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	0.31	0.27	0.04

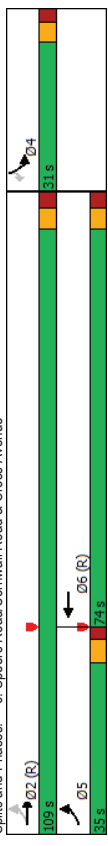
Intersection Summary  
m Volume for 95th percentile queue is metered by upstream signal.

**HCM Signalized Intersection Capacity Analysis** Future Background AM  
5. St. Augustine Drive & Speers Road

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
<b>Movement</b>												
Lane Configurations		EB	EB							WB	WB	WB
Traffic Volume (vph)	5	850	15	0	720	15	0	0	0	20	0	0
Future Volume (vph)	5	850	15	0	720	15	0	0	0	20	0	0
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				6.3			
Lane Util. Factor	1.00	0.95	1.00	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	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	1.00	1.00	1.00	1.00	1.00	1.00
Flt	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	1796	3430	3425	1796	3430	3425	1796	3430	3425
Flt Permitted	0.34	1.00	1.00	0.34	1.00	1.00	0.34	1.00	1.00	0.34	1.00	1.00
Satd. Flow (perm)	638	3430	3425	638	3430	3425	638	3430	3425	638	3430	3425
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	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	22	0	0	0
Lane Group Flow (vph)	6	983	0	0	835	0	0	0	1	0	0	0
Conf. Ped. (#/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%
<b>Turn Type</b>	Perm	NA	NA	NA	NA	NA	NA	NA	Perm	Perm	Perm	
Protected Phases	4			8					2	6	6	
Permitted Phases	4			8					2	6	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	
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	
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	
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)	555	2986	2982	555	2982	2982	555	2982	43	43	43	
v/s Ratio Prot	c0.29		0.24									
v/s Ratio Perm	0.01		c0.00									
v/c Ratio	0.01	0.33	0.28	0.01					0.01	0.01	0.01	
Uniform Delay, d1	1.0	1.4	1.3	1.0					56.8			
Progression Factor	1.19	0.96	3.76	1.19					1.00			
Incremental Delay, d2	0.0	0.2	0.2	0.0					0.1			
Delay (s)	1.2	1.6	5.2	1.2					56.9			
Level of Service	A	A	A	A					E			
Approach Delay (s)	1.6	5.2	5.2	1.6					56.9			0.0
Approach LOS	A	A	A	A					E			A
<b>Intersection Summary</b>												
HCM 2000 Control Delay	3.9 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.32											
Actuated Cycle Length (s)	120.0 Sum of lost time (s)											
Intersection Capacity Utilization	38.3% ICU Level of Service											
Analysis Period (min)	15											
c Critical Lane Group												

**Timings** Future Background AM  
6. Speers Road/Cornwall Road & Cross Avenue

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
<b>Lane Group</b>												
Lane Configurations		EB	EB							WB	WB	WB
Traffic Volume (vph)	205	1220	610	5	245					5	245	
Future Volume (vph)	205	1220	610	5	245					5	245	
Turn Type	pm-plt	NA	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							
Minimum Initial (s)	12.0	47.6	47.6	15.8	15.8							
Minimum Split (s)	35.0	109.0	74.0	31.0	31.0							
Total Split (%)	25.0%	77.9%	52.9%	22.1%	22.1%							
Maximum Green (s)	29.0	102.4	67.4	25.2	25.2							
Yellow Time (s)	4.0	3.7	3.7	3.3	3.3							
All-Red Time (s)	2.0	2.9	2.9	2.5	2.5							
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0							
Total Lost Time (s)	6.0	6.6	6.6	5.8	5.8							
Lead/Lag			Lead		Lag							
Lead-Lag Optimize?	Yes	Yes	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									
<b>Intersection Summary</b>												
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	↑	↑↑	↑↑	↑	↑↑
Traffic Volume (vph)	205	1220	610	20	5
Future Volume (vph)	205	1220	610	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	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>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)	573	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	0.30	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	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					

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												
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	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						
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	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	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							

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		
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	1701	1612	1775	1775	1775	1775	1775	1775	1775	1775	1775	1775
Satd. Flow (prot)	0.79	0.94	1.00	1.00	0.90	1.00	1.00	0.90	1.00	0.90	1.00	0.90
Statd. Flow (perm)	1388	1532	1769	1769	1572	1769	1769	1572	1769	1572	1769	1572
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	43	30	6	24	43	85	6	518	24	49	348	37
RTOR Reduction (vph)	0	5	0	0	68	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	74	0	0	84	0	0	547	0	0	431	0
Confl. Peds. (#/hr)	20	20	20	20	30	20	30	35	35	35	30	30
Heavy Vehicles (%)	2%	7%	16%	0%	5%	4%	28%	6%	0%	2%	6%	6%
Bus Blockages (#/hr)	0	2	0	0	2	0	0	0	0	0	4	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)	15.2			15.2			49.0		49.0	49.0		49.0
Effective Green, g (s)	15.2			15.2			48.0		48.0	48.0		48.0
Actuated G/C Ratio	0.20			0.20			0.65		0.65	0.65		0.65
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)	281			310			1155		1155	1027		1027
v/s Ratio Prot	0.05			c0.05			c0.31		c0.31	0.27		0.27
v/c Ratio Perm	0.26			0.27			0.47		0.47	0.42		0.42
Uniform Delay, d1	25.2			25.2			6.5		6.5	6.2		6.2
Progression Factor	1.00			1.00			1.00		1.00	1.00		1.00
Incremental Delay, d2	0.7			0.6			1.4		1.4	0.3		0.3
Delay (s)	25.9			25.9			7.9		7.9	6.5		6.5
Level of Service	C			C			A		A	A		A
Approach Delay (s)	25.9			25.9			7.9		7.9	6.5		6.5
Approach LOS	C			C			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	68.4% ICU Level of Service C											
Analysis Period (min)	15											
c Critical Lane Group												

10: Dorval 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	17	17	17	17	17	17	17	17	17	17	17	17
Traffic Volume (vph)	215	115	20	120	110	1260	145	985	145	985	145	985
Future Volume (vph)	215	115	20	120	110	1260	145	985	145	985	145	985
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				
Permitted Phases	7	4	3	8	5	2	1	6				
Detector Phase	7	4	3	8	5	2	1	6				
Switch Phase												
Minimum Initial (s)	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 Split (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
Total 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											

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	10.1	105.0	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	TT	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	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	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	0.28	c0.05	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	D	C	C
Intersection Summary									
HCM 2000 Control Delay	28.4		HCM 2000 Level of Service		C				
HCM 2000 Volume to Capacity ratio	0.62								
Actuated Cycle Length (s)	120.0								
Sum of lost time (s)	24.0								
Intersection Capacity Utilization	71.7%								
ICU Level of Service	C								
Analysis Period (min)	15								
Critical Lane Group	c								

# 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	
Grade	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	
Median type						
Median storage (veh)						
Upstream signal (m)						
pX 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)						
p0 queue free %	3.5	3.3	2.3			
IF (s)	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
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					
Intersection Summary						
Average Delay	2.1					
Intersection Capacity Utilization	37.5%					
ICU Level of Service	A					
Analysis Period (min)	15					

# 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	4
Permitted Phases	8	8	2	2	6	6	
Detector Phase							
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	
Lead/Lag			Lag	Lead	Lead		
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	7.0	10.0	10.0	10.0	7.0	7.0
Flash Don't Walk (s)	11.0	11.0	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	49.4						
Natural Cycle	65						
Control Type	Semi Ad-Uncoordinated						
Splits and Phases	2: Kerr Street & Shepherd Road						
Ø1	23.6						
Ø2	53.5						
Ø3		53.5					
Ø4			53.5				
Ø5				53.5			
Ø6					53.5		

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	588	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
<b>Intersection Summary</b>						

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

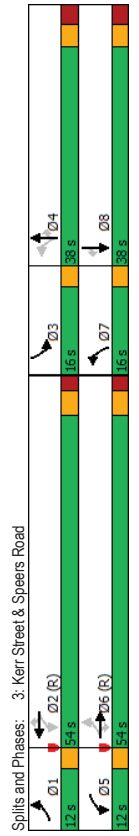
Future Background PM  
Upper Kerr Village (8/24-01)

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				0.0	17.3	11.2	11.2	4.2	4.2			
Approach Delay (s)				A	B	B	B	A	A			
Approach LOS				A	B	B	B	A	A			
<b>Intersection Summary</b>												
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** Future Background PM  
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	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	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 Don't 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/WBTL and 6/EBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated



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

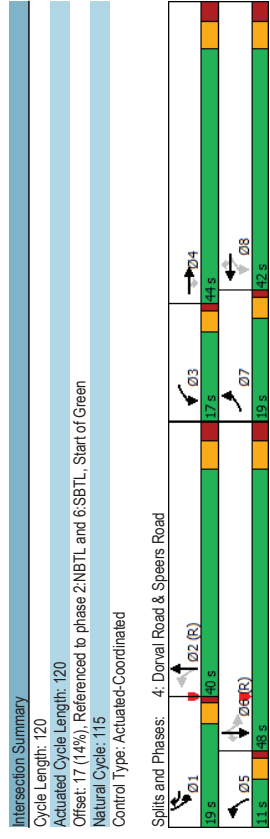
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	68	611	137	316	937	526	147	179	247	305	284	74
v/c Ratio	0.20	0.39	0.18	0.65	0.52	0.52	0.50	0.51	0.52	0.82	0.75	0.20
Control Delay	11.0	22.9	10.4	22.3	23.3	4.0	32.3	47.5	9.0	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.

HCM Signalized Intersection Capacity Analysis  
 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 (vehph)	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	0.94	1.00	0.93	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
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)	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	1.00	0.85	1.00	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	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	4	3	8	8	8
Permitted Phases	6	6	2	2	2	4	4	4	4	4	4	4
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	0.04	c0.07	0.26	0.18	0.10	0.05	0.10	c0.09	c0.15	0.01
v/s Ratio Perm	0.10	0.31	0.09	0.66	0.53	0.35	0.52	0.51	0.18	0.82	0.75	0.05
v/s Ratio	16.2	22.2	19.1	14.0	20.3	18.2	34.1	43.7	40.9	52.4	45.1	38.7
Uniform Delay, d1	0.79	0.94	2.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	0.3	0.7	0.2	3.1	1.1	1.3	1.3	1.6	0.4	12.9	8.2	0.1
Incremental Delay, d2	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	D	E	D
Approach Delay (s)	25.6	C	C	20.1	C	41.1	D	D	D	E	57.2	E
Approach LOS	C	C	C	C	C	D	D	D	D	E	E	E

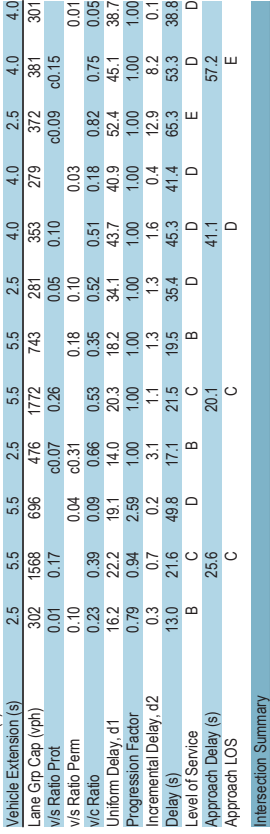


Splits and Phases: 4: Dorval Road & Speers Road  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Offset: 17 (14%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green  
 Natural Cycle: 115  
 Control Type: Actuated-Coordinated

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 BA Group - EFS  
 Synchro 11 Report  
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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)	415	515	50	195	690	475	65	615	270	685	375	375
Future Volume (vph)	415	515	50	195	690	475	65	615	270	685	375	375
Turn Type	Prot	NA	Perm	pm-pt	NA	pm-ov	pm-pt	NA	pm+pt	NA	pm	Perm
Protected Phases	7	4	4	8	8	2	2	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 (%)	15.8%	36.7%	36.7%	14.2%	35.0%	15.8%	9.2%	33.3%	15.8%	40.0%	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	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	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	Lag	Lead	Lag	Lag	Lead	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	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	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	26.0	26.0
Pedestrian Calls (#/hr)	5	5	5	5	5	5	5	5	5	5	5	5



Splits and Phases: 4: Dorval Road & Speers Road  
 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

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 BA Group - EFS  
 Synchro 11 Report  
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Queues  
4: Dorval Road & Speers Road

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

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

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

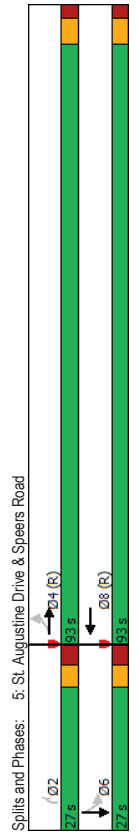
	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group	451	560	54	212	750	516	71	750	293	745	408
Lane Group Flow (vph)	0.92	0.50	0.09	0.54	0.78	0.72	0.25	0.79	0.89	0.68	0.51
v/c Ratio	75.8	35.8	0.3	33.1	54.8	23.3	21.2	46.8	59.9	16.9	2.7
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue 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	60.0	85.0	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.											

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	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
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 Flow (prot)	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	283	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	283	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	4	3	8	1	5	2	1	6	6
Permitted Phases	17	37.4	37.4	44.6	32.4	48.5	38.1	32.3	52.4	42.6	42.6
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)	0.14	0.31	0.31	0.37	0.27	0.40	0.32	0.27	0.44	0.36	0.36
Actuated g/C Ratio	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0	4.0	7.0	4.0
Clearance Time (s)	3.0	5.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0
Vehicle Extension (s)	492	1109	484	377	957	638	250	946	324	1268	567
Lane Grp Cap (vph)	c0.13	0.16	0.01	0.06	c0.21	0.10	0.01	0.21	c0.12	0.21	0.11
v/s Ratio Prot	0.92	0.50	0.03	0.56	0.78	0.74	0.28	0.78	0.90	0.59	0.31
v/s Ratio Perm	50.7	33.7	28.7	27.0	40.6	30.4	29.2	40.6	27.3	31.5	28.1
v/c Ratio	1.00	1.00	1.00	1.42	1.20	0.80	1.00	1.00	1.48	0.48	0.17
Uniform Delay, d1	21.8	0.8	0.1	1.9	4.8	4.5	0.6	6.5	23.4	1.6	1.2
Progression Factor	72.5	34.5	28.8	40.3	53.6	28.9	29.8	47.1	63.8	16.9	5.9
Incremental Delay, d2	E	C	C	D	D	C	C	D	E	B	A
Delay (s)	E	C	C	D	D	C	C	D	E	B	A
Level of Service	E	C	C	D	D	C	C	D	E	B	A
Approach Delay (s)	50.3			43.1				23.3			
Approach LOS	D			D				C			
Intersection Summary											
HCM 2000 Control Delay	39.2 HCM 2000 Level of Service D										
HCM 2000 Volume to Capacity ratio	0.69										
Actuated Cycle Length (s)	120.0 Sum of lost time (s) 22.0										
Intersection Capacity Utilization	85.1% ICU Level of Service E										
Analysis Period (min)	15										
c Critical Lane Group											

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		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	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.





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)					
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)	431	2924	2100	415	858
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	0.65	0.02	0.51
Intersection Summary					

	EBL	EBT	WBT	SBL	SBR
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	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												
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	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	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)												
Median type							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		
p0 queue free %	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								
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%								B	
Analysis Period (min)			15									

Movement	EBL	EBR	NBL	NBT	SBL	SBR
Lane Configurations						
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	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	542	658	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	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)						
p0 queue free %	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%			A
Analysis Period (min)			15			

Timings 9: Kerr Street & Stewart Street

Queues 9: Kerr Street & Stewart Street

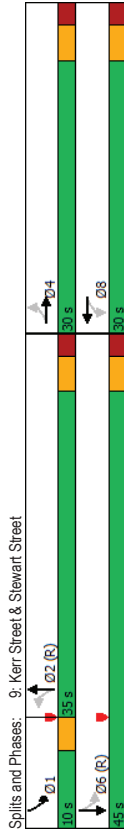
Future Background PM Upper Kerr Village (8/24-01)

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	4	4	8	8	2	2	1	6
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	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
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



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

9: Kerr Street & Stewart Street

Future Background PM  
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	395	15	55	515	50
Traffic Volume (vph)	50	10	15	10	15	75	10	395	15	55	515	50
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	
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			0.99	
Fpb. ped/bikes	0.98			1.00				1.00			1.00	
Ft	0.97			0.90				1.00			0.99	
Flt Protected	0.97			0.99				1.00			1.00	
Satd. Flow (prot)	1661			1562				1855			1803	
Flt Permitted	0.77			0.97				0.98			0.93	
Satd. Flow (perm)	1323			1518				1828			1683	
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	429	16	60	560	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	455	0	0	671	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		1		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		1144		1144	
v/s Ratio Prot												
v/s Ratio Perm	c0.05			0.03			0.25		c0.40		c0.40	
v/c Ratio	0.29			0.16			0.37		0.59		0.59	
Uniform Delay, d1	26.8			26.2			5.1		6.4		6.4	
Progression Factor	1.00			1.00			1.00		1.00		1.00	
Incremental Delay, d2	1.0			0.4			0.8		0.8		0.8	
Delay (s)	27.8			26.5			5.9		7.2		7.2	
Level of Service	C			C			A		A		A	
Approach Delay (s)	27.8			26.5			5.9		7.2		7.2	
Approach LOS	C			C			A		A		A	
Intersection Summary												
HCM 2000 Control Delay				9.6			HCM 2000 Level of Service		A		A	
HCM 2000 Volume to Capacity ratio				0.65								
Actuated Cycle Length (s)				75.0			Sum of lost time (s)		13.8		13.8	
Intersection Capacity Utilization				81.6%			ICU Level of Service		D		D	
Analysis Period (min)				15								
c Critical Lane Group												

10: Dorval Road & Wycroft Road

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

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations	385	215	60	90	475	95	1265	110	1105
Traffic Volume (vph)	385	215	60	90	475	95	1265	110	1105
Future Volume (vph)	385	215	60	90	475	95	1265	110	1105
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: Dorval Road & Wycroft Road								
	Ø1	Ø2 (R)	Ø3	Ø4	Ø5	Ø6 (R)	Ø7	Ø8	Ø9
	17 s	42 s	21 s	40 s	17 s	42 s	21 s	40 s	17 s

Queues  
10: Dorval Road & Wynecroft 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				
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 & Wynecroft 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	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	0.95	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	1.00	0.95
Satd. Flow (prot)	3213	3217	1783	1727	1590	1736	5040	3502	4964	3502	4964	4964
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	4964
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		0.12	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	0.88		
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			

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

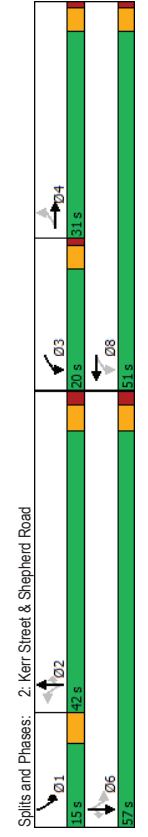
Future Total AM (Interim)  
 Upper Kerr Village (8/24-01)

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	
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	pm-pt	NA	Perm	NA
Protected Phases		4	3	8	2	2		1	6	
Permitted Phases	4	4	8	8	2	2	2	2	6	6
Detector Phase	4	4	3	8	2	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	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	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					57.1					
Natural Cycle					75					
Control Type					Semi Ad-Uncoord					



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		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
v/c Ratio	22.3	21.4	14.2	13.7	13.5	13.8	12.8	7.6	8.2	7.1
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	1.3	0.1	0.5	0.1	0.4	0.1	0.0	0.1	0.1	0.0
Incremental Delay, d2	23.6	21.5	14.7	13.8	13.9	13.9	12.8	7.8	8.3	7.1
Delay (s)	C	C	B	B	B	B	B	A	A	A
Level of Service	C	C	B	B	B	B	B	A	A	A
Approach Delay (s)	22.7	14.1	13.7	13.7	13.7	13.7	8.2	8.2	8.2	A
Approach LOS	C	C	B	B	B	B	B	A	A	A

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
v/c Ratio	22.3	21.4	14.2	13.7	13.5	13.8	12.8	7.6	8.2	7.1
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	1.3	0.1	0.5	0.1	0.4	0.1	0.0	0.1	0.1	0.0
Incremental Delay, d2	23.6	21.5	14.7	13.8	13.9	13.9	12.8	7.8	8.3	7.1
Delay (s)	C	C	B	B	B	B	B	A	A	A
Level of Service	C	C	B	B	B	B	B	A	A	A
Approach Delay (s)	22.7	14.1	13.7	13.7	13.7	13.7	8.2	8.2	8.2	A
Approach LOS	C	C	B	B	B	B	B	A	A	A

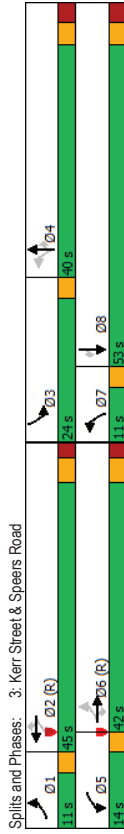


Timings 3: Kerr Street & Speers Road

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	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
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	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

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)

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  
 HCM Signalized Intersection Capacity Analysis  
 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	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 (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	0.95	1.00	0.95	1.00	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
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	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)	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	0.02	c0.08	0.19	0.02	0.02	0.08	c0.13	0.11	0.02	0.02
v/s Ratio Perm	0.10	0.02	0.02	c0.28	0.06	0.07	0.06	0.07	c0.21	0.11	0.02	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	C	C	29.4	C	C	53.9	D	E	45.7	D	D
Approach LOS	C	C	C	C	C	C	D	D	D	D	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  
 Timings  
 Future Total AM (Interim)  
 Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	
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	6	
Protected 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	7.0	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 (%)	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: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 (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	FF	FF	F	FF	FF	F	FF	FF	F	FF	F
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
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)	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	0	70	0	10	0	0
Lane Group Flow (vph)	451	641	12	92	429	267	76	1028	0	288	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	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	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	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)											
Approach LOS		E			C			D		C	

Intersection Summary	Value	Unit
HCM 2000 Control Delay	40.3	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	85.5%	ICU Level of Service
Analysis Period (min)	15	

c Critical Lane Group

Timings  
5. St. Augustine Drive & Speers Road

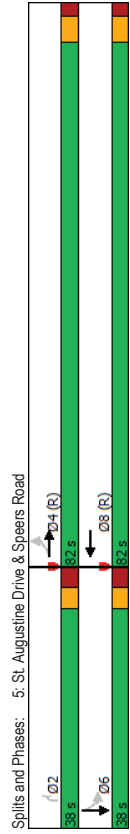
Queues  
5. St. Augustine Drive & Speers Road

Future Total AM (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.

5. St. Augustine Drive & Speers Road

6. Speers Road/Cornwall Road & Cross Avenue

Future Total AM (Interim)

Future Total AM (Interim)

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	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	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	3427	3427	3427	3427	3427	1565	1565	1565	1565
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	3427	3427	3427	3427	3427	1565	1565	1565	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	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%	5%	0%	0%	5%	0%	0%	0%
Turn Type	Perm	NA	NA	NA	NA	NA	NA	NA	Perm	Perm	Perm	SBR
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	2984	2984	2984	2984	2984	43	43	43	43
v/s Ratio Prot	0.01								0.28			
v/s Ratio Perm	0.01								c0.00			
v/c Ratio	0.01	0.34	0.32	0.32	0.32	0.32	0.32	0.32	0.01	0.01	0.01	0.01
Uniform Delay, d1	1.0	1.4	1.4	1.4	1.4	1.4	1.4	1.4	56.8	56.8	56.8	56.8
Progression Factor	1.14	0.95	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	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	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	5.3	5.3	5.3	5.3	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												

Future Total AM (Interim)

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	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	Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lead
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: 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										
→ Ø4			31.5									

	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
<b>Intersection Summary</b>					

	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			0.01	
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		
<b>Intersection Summary</b>					
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												
Traffic Volume (veh/h)	5	0	5	0	0	40	5	555	5	40	400	5
Future Volume (Veh/h)	5	0	5	0	0	40	5	555	5	40	400	5
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	0.84	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	661	6	48	476	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					
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								
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										
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			58.2%								B	
Analysis Period (min)			15									

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
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	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	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			
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					
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			43.7%			ICU Level of Service
Analysis Period (min)			15			A

Timings  
9: Kerr Street & Stewart Street

Queues  
9: Kerr Street & Stewart Street

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

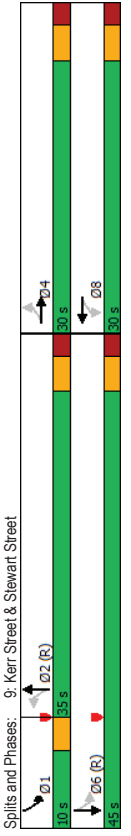
Future Total AM (Interim)  
Upper Kerr Village (8/24-01)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations	4	4	8	8	2	2	6
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	NA
Protected Phases	4		8		2		6
Permitted Phases	4	4	8	8	2	2	1
Detector Phase	4	4	8	8	2	2	1
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:NBTL 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:NBTL 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 (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
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	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	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	25.2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Grp Cap. (vph)	0.7	25.9	25.9	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
v/s Ratio Prot	C	C	C	A	A	A	A	A	A	A	A	A
v/s Ratio Perm	C	C	C	A	A	A	A	A	A	A	A	A
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	75.0	75.0	75.0	15	15	15	15	15	15	15	15	15
Progression Factor	67.1%	67.1%	67.1%	67.1%	67.1%	67.1%	67.1%	67.1%	67.1%	67.1%	67.1%	67.1%
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	C	C	C	A	A	A	A	A	A	A	A	A
Approach Delay (s)	25.9	25.9	25.9	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
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	<p>HCM 2000 Control Delay</p> <p>HCM 2000 Level of Service: B</p>											
HCM 2000 Volume to Capacity ratio	<p>HCM 2000 Volume to Capacity ratio</p> <p>Sum of lost time (s): 13.8</p>											
Actuated Cycle Length (s)	<p>Actuated Cycle Length (s)</p> <p>ICU Level of Service: C</p>											
Intersection Capacity Utilization	<p>Intersection Capacity Utilization</p> <p>Analysis Period (min): 15</p>											
Analysis Period (min)	<p>Analysis Period (min)</p>											
Critical Lane Group	<p>Critical Lane Group</p>											

10: Dorval Road & Wyecroft 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	17	4	3	8	2	2	2	2	2	1	6	6
Traffic Volume (vph)	215	120	20	130	110	1345	110	1345	155	995	995	995
Future Volume (vph)	215	120	20	130	110	1345	110	1345	155	995	995	995
Ideal Flow (vphpt)	7	4	3	8	2	2	2	2	2	1	6	6
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	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	4	0
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	2	1	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	25.2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Grp Cap. (vph)	0.7	25.9	25.9	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
v/s Ratio Prot	C	C	C	A	A	A	A	A	A	A	A	A
v/s Ratio Perm	C	C	C	A	A	A	A	A	A	A	A	A
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	75.0	75.0	75.0	15	15	15	15	15	15	15	15	15
Progression Factor	67.1%	67.1%	67.1%	67.1%	67.1%	67.1%	67.1%	67.1%	67.1%	67.1%	67.1%	67.1%
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	C	C	C	A	A	A	A	A	A	A	A	A
Approach Delay (s)	25.9	25.9	25.9	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
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	<p>HCM 2000 Control Delay</p> <p>HCM 2000 Level of Service: B</p>											
HCM 2000 Volume to Capacity ratio	<p>HCM 2000 Volume to Capacity ratio</p> <p>Sum of lost time (s): 13.8</p>											
Actuated Cycle Length (s)	<p>Actuated Cycle Length (s)</p> <p>ICU Level of Service: C</p>											
Intersection Capacity Utilization	<p>Intersection Capacity Utilization</p> <p>Analysis Period (min): 15</p>											
Analysis Period (min)	<p>Analysis Period (min)</p>											
Critical Lane Group	<p>Critical Lane Group</p>											

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
Lane Configurations	TT	TT	T	T	TT	TT	TT	TT
Traffic Volume (vph)	215	120	105	20	130	240	110	1345
Future Volume (vph)	215	120	105	20	130	240	110	1345
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	0.95
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3127	3072	1637	3129	1641	5035	3433	4667
Flt Permitted	0.95	1.00	0.60	1.00	0.08	1.00	0.95	1.00
Satd. Flow (perm)	3127	3072	1034	3129	140	5035	3433	4667
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	114	22	141	261	120	1462
RTOR Reduction (vph)	0	87	0	0	200	0	3	0
Lane Group Flow (vph)	234	157	0	22	202	0	120	1524
Confl. Peds. (#/hr)	2	3	3	2	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	28.9	21.8	17.9	61.7	50.1	13.1	51.6
Effective Green, g (s)	14.9	28.9	21.8	17.9	61.7	50.1	13.1	51.6
Actuated g/C Ratio	0.12	0.24	0.18	0.15	0.51	0.42	0.11	0.43
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	739	207	466	217	2102	374	2006
v/s Ratio Prot	c0.07	0.05	0.00	c0.06	c0.05	0.30	0.05	c0.32
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
Uniform Delay, d1	49.8	36.5	40.7	46.4	19.4	23.2	50.1	28.8
Progression Factor	1.00	1.00	1.00	1.00	1.21	0.60	1.00	1.00
Incremental Delay, d2	3.9	0.3	0.5	1.4	2.5	1.1	1.8	2.6
Delay (s)	53.6	36.8	41.2	47.8	26.1	18.7	51.9	31.4
Level of Service	D	D	D	D	C	B	D	C
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							
c. Critical Lane Group								

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%					
Analysis Period (min)	15					
					ICU Level of Service	A

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	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	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%					
Analysis Period (min)	15					
					ICU Level of Service	A

Timings  
2: Kerr Street & Shepherd Road

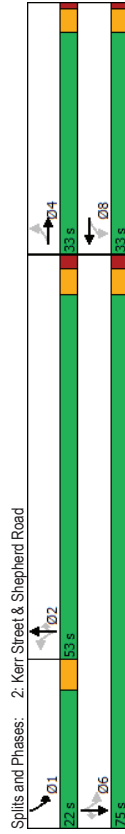
Queues  
2: Kerr Street & Shepherd Road

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	Lead	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: 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)	241.3									
Turn Bay Length (m)	50.0									
Base Capacity (vph)	725	976	781	1002	860	3372	1466	844	3574	1583
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_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	0.87	1.00	0.86	1.00	0.86	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	1.00	0.95
Satd. Flow (prot)	1770	1620	1732	1593	1770	1593	1770	1593	1770	1593	1804	3574
Flt Permitted	0.68	1.00	0.73	1.00	0.68	1.00	0.68	1.00	0.68	1.00	1.00	0.68
Satd. Flow (perm)	1221	1620	1335	1593	1221	1593	1221	1593	1221	1593	1645	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)	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	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	Perm	NA	NA	Perm	NA	Perm	pm-pt	NA	Perm
Protected Phases	4			8			2		2	1	6	
Permitted Phases	4			8			2		2	1	6	
Actuated Green, G (s)	9.3	9.3	9.3	9.3	9.3	9.3	19.1	19.1	19.1	30.7	30.7	6
Effective Green, g (s)	9.3	9.3	9.3	9.3	9.3	9.3	19.1	19.1	19.1	30.7	30.7	6
Actuated G/C Ratio	0.19	0.19	0.19	0.19	0.19	0.19	0.39	0.39	0.39	0.62	0.62	0.07
Clearance Time (s)	4.0	4.0	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	3.0	3.0	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	
v/s Ratio Prot	0.01			0.02			c0.16		0.03	0.13		
v/s Ratio Perm	0.03			c0.07			0.14		0.03	0.13		
Uniform Delay, d1	16.7	16.3	17.5	16.6	10.8	11.0	9.5	4.1	4.0	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	11.5	11.3	9.5	4.3	4.1	4.1	3.6	
Level of Service	B	B	B	B	B	B	B	A	A	A	A	A
Approach Delay (s)	16.7			17.4			11.1		11.1	4.1		
Approach LOS	B			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)

Movement	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
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_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	0.87	1.00	0.86	1.00	0.86	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	1.00	0.95
Satd. Flow (prot)	1770	1620	1732	1593	1770	1593	1770	1593	1770	1593	1804	3574
Flt Permitted	0.68	1.00	0.73	1.00	0.68	1.00	0.68	1.00	0.68	1.00	1.00	0.68
Satd. Flow (perm)	1221	1620	1335	1593	1221	1593	1221	1593	1221	1593	1645	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)	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	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	Perm	NA	NA	Perm	NA	Perm	pm-pt	NA	Perm
Protected Phases	4			8			2		2	1	6	
Permitted Phases	4			8			2		2	1	6	
Actuated Green, G (s)	9.3	9.3	9.3	9.3	9.3	9.3	19.1	19.1	19.1	30.7	30.7	6
Effective Green, g (s)	9.3	9.3	9.3	9.3	9.3	9.3	19.1	19.1	19.1	30.7	30.7	6
Actuated G/C Ratio	0.19	0.19	0.19	0.19	0.19	0.19	0.39	0.39	0.39	0.62	0.62	0.07
Clearance Time (s)	4.0	4.0	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	3.0	3.0	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	
v/s Ratio Prot	0.01			0.02			c0.16		0.03	0.13		
v/s Ratio Perm	0.03			c0.07			0.14		0.03	0.13		
Uniform Delay, d1	16.7	16.3	17.5	16.6	10.8	11.0	9.5	4.1	4.0	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	11.5	11.3	9.5	4.3	4.1	4.1	3.6	
Level of Service	B	B	B	B	B	B	B	A	A	A	A	A
Approach Delay (s)	16.7			17.4			11.1		11.1	4.1		
Approach LOS	B			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												

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	5.9	3.0	6.3	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	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	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	0.95	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)	188	595	137	316	953	521	147	189	247	316	274	53
RTOR Reduction (vph)	0	0	75	0	0	258	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	6.3	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	0.14
v/s Ratio Perm	0.23	0.04	0.04	0.31	0.18	0.18	0.09	0.03	0.03	0.03	0.01	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

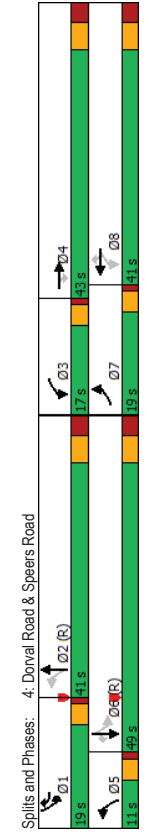
HCM 2000 Control Delay	31.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		
c. Critical Lane Group			

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

4: Dorval Road & 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	←←	←←	←	←←	←←	←	←←	←←	←	←	←	←
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	0.98	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Fpb. ped/bikes	1.00	1.00	0.85	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	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	0.99	1.00	1.00	0.95	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%	1%	2%	1%	1%	1%	1%	1%	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	NA
Protected Phases	7	4	3	8	1	5	2	1	6	1	6	6
Permitted Phases	4	3	8	8	2	8	2	8	2	6	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	0.01	c0.13	0.21	0.01	0.21
v/s Ratio Perm	0.01	0.14	0.01	0.14	0.21	0.08	0.29	0.01	c0.29	0.08	0.01	0.21
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	B	A
Approach Delay (s)	49.5	D	D	43.5	D	45.1	D	25.0	D	C	C	C
Approach LOS	D	D	D	D	D	D	D	D	D	D	D	D
Intersection Summary												
HCM 2000 Control Delay	39.5 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) 22.0											
Intersection Capacity Utilization	85.9% ICU Level of Service E											
Analysis Period (min)	15											
c Critical Lane Group												

5: St. Augustine Drive & 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	←←	←←	←	←←	←←	←	←←	←←	←	←	←	←
Traffic Volume (vph)	10	845	1115	10	845	1115	25	5	0	5	0	0
Future Volume (vph)	10	845	1115	10	845	1115	25	5	0	5	0	0
Turn Type	Perm	NA	NA	NA	Perm	Perm	NA	Perm	NA	NA	NA	NA
Protected Phases	4	4	4	8	2	6	6	6	6	6	6	6
Detector Phases	4	4	4	8	2	6	6	6	6	6	6	6
Switch Phase	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 Initial (s)	23.9	23.9	23.9	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3
Minimum Split (s)	93.0	93.0	93.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0
Total Split (%)	77.5%	77.5%	77.5%	22.5%	22.5%	22.5%	22.5%	22.5%	22.5%	22.5%	22.5%	22.5%
Maximum Green (s)	87.1	87.1	87.1	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7
Yellow Time (s)	3.7	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)	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	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)	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
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												
(L)D2												
27.5												
D6												
27.5												
D6 (R)												
27.5												



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
<b>Intersection Summary</b>						
m Volume for 95th percentile queue is metered by upstream signal.						

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

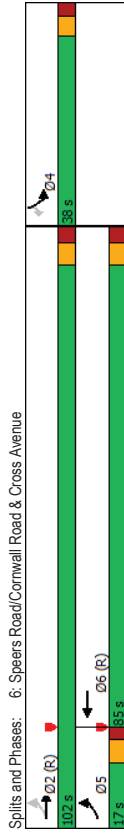
Future Total PM (Interim)  
Upper Kerr Village (8/24-01)

	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	1	1	1	1	1	1	1	1	1	1	1	1
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	0.95	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
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	1.00
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	1.00
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	0
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								2			6
Actuated Green, G (s)	104.0	104.0			104.0				3.8			3.8
Effective Green, g (s)	104.0	104.0			104.0				3.8			3.8
Actuated g/C Ratio	0.87	0.87			0.87				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)	387	3078			3093				52			51
v/s Ratio Prot	0.25				0.33				0.00			0.00
v/c Ratio Perm	0.02				0.38				0.02			0.09
Uniform Delay, d1	1.1	1.4			1.6				56.3			56.3
Progression Factor	0.69	0.68			0.96				1.00			1.00
Incremental Delay, d2	0.1	0.2			0.3				0.1			0.7
Delay (s)	0.8	1.2			1.8				56.4			56.3
Level of Service	A	A			A				E			E
Approach Delay (s)	1.1				1.8				56.4			56.6
Approach LOS	A				A				E			E
<b>Intersection Summary</b>												
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	1.00	0.95	1.00	0.88	1.00
Frb. ped/bikes	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
Frt	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-prot	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					
v/c Ratio	0.64	0.26	0.66	0.05	0.61	c0.06
Uniform Delay, d1	26.3	3.2	19.8	56.7	60.2	60.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.4	0.2	1.7	0.1	4.0	4.0
Delay (s)	29.7	3.5	21.5	56.9	64.2	64.2
Level of Service	C	A	C	E	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	Free	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	30	30	30	30	30
Lane Width (m)	3.6	3.6	3.6	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
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	3	3	3	3	3
Right turn flare (veh)											
Median type											
Median storage (veh)											
Upstream signal (m)								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						
vSH	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								
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

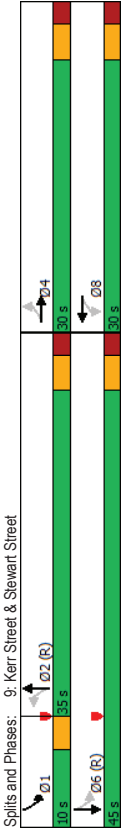
Future Total PM (Interim)  
Upper Kerr Village (8/24-01)

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)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	4	4	4	4	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		8		2	1
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:NBTL 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

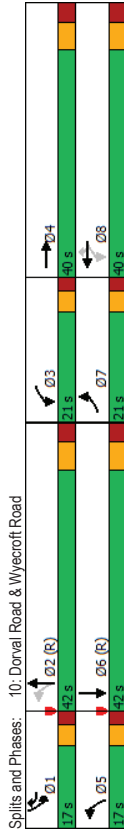
Future Total PM (Interim)  
Upper Kerr Village (8/24-01)

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											
Fpb. ped/bikes	0.99											
Fibb. 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	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	385	225	60	95	490	95	1280	130
Traffic Volume (vph)	385	225	60	95	490	95	1280	130
Future Volume (vph)	Prot	NA	pm+pt	NA	pm+ov	pm+pt	NA	Prot
Turn Type	7	4	3	8	1	5	2	1
Protected Phases								
Permitted Phases	7	4	3	8	1	5	2	1
Detector Phase								
Switch Phase								
Minimum Initial (s)	7.0	10.0	7.0	10.0	7.0	20.0	7.0	20.0
Minimum Split (s)	12.0	25.0	12.0	25.0	12.0	41.0	12.0	41.0
Total Split (s)	21.0	40.0	21.0	40.0	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%
Maximum Green (s)	16.0	33.0	16.0	33.0	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
All-Red Time (s)	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
Total Lost Time (s)	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 Optimize?	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
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	None	None	None	C-Min
Walk Time (s)	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
Pedestrian Calls (#/hr)	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	NBL	NBT	SBL	SBT
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	418	430	65	103	533	103	1434	141
v/c Ratio	0.98	0.57	0.22	0.47	0.88	0.42	0.85	0.20
Control Delay	90.1	31.3	29.9	54.9	45.0	13.8	38.1	39.9
Queue Delay	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
Queue Length 50th (m)	51.2	31.8	10.9	23.0	91.0	8.3	131.5	13.8
Queue Length 95th (m)	#82.7	46.3	19.4	37.7	129.7	m12.3,m#155.3	23.6	128.5
Internal Link Dist (m)	155.6	199.3			65.0	494.4		672.1
Turn Bay Length (m)	115.0	145.0			65.0	125.0		125.0
Base Capacity (vph)	428	1001	372	474	607	269	1690	721
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	0.43	0.17	0.22	0.88	0.38	0.85	0.20

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 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	8	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	0.33
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	0.43
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	38.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	0.75	0.90	1.00	1.00	1.00	1.00	0.75
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	1.1
Delay (s)	89.2	44.5	40.0	50.7	54.5	18.1	38.3	39.7	27.9	39.7	27.9	40.0
Level of Service	F	D	D	D	D	B	D	D	C	D	C	D
Approach Delay (s)	66.5	E	52.6	D	D	36.9	D	28.9	C	28.9	C	36.9
Approach LOS	E	E	D	D	D	D	D	D	D	D	D	D
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	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	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)						
IF (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

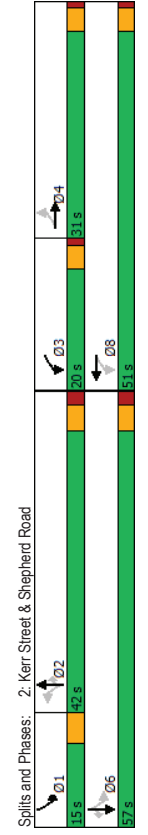
Future Total AM (Ultimate)  
 Upper Kerr Village (8/24-01)

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	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	4	4	3	8	2	2	2	1	6	6
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-Uncooord									





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

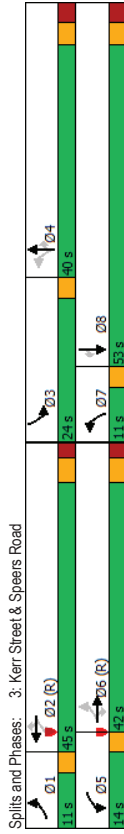
Future Total AM (Ultimate)  
Upper Kerr Village (8/24-01)

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	0	155	0	0	0	47	0	0	16
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	0	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	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											
HCM 2000 Volume to Capacity ratio	0.35											
Actuated Cycle Length (s)	59.6								17.2			
Intersection Capacity Utilization	63.7%											
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)	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 (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.



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	↑↑	↑↑	↑	↑	↑↑	↑↑	↑↑	↑↑	↑	↑	↑
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	0	70	0	10	0	0
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	58.4	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		
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)

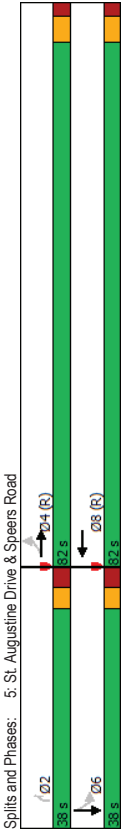
Future Total AM (Ultimate)  
Upper Kerr Village (8/24-01)

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	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	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)	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  
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

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

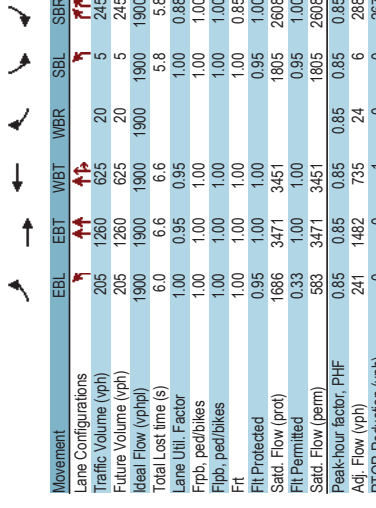




Queues  
6: Speers Road/Cornwall Road & Cross Avenue

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

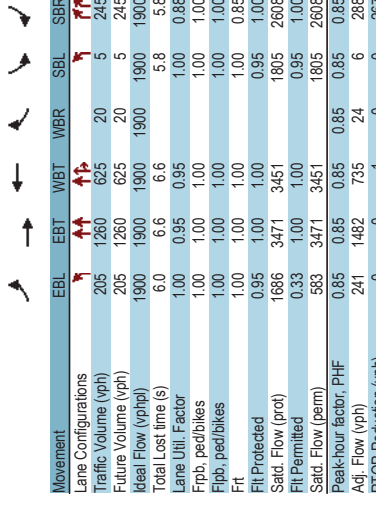
	EBL	EBT	WBT	SBL	SBR
Lane Group	241	1482	759	6	288
Lane Group Flow (vph)	0.43	0.51	0.30	0.05	0.63
v/c Ratio	4.5	4.0	7.3	60.6	12.9
Control Delay	0.0	0.0	0.0	0.0	0.0
Queue Delay	4.5	4.0	7.3	60.6	12.9
Total Delay	9.4	47.2	34.4	1.6	0.0
Queue Length 50th (m)	14.5	56.3	44.8	5.7	11.7
Queue Length 95th (m)	47.4	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)

Movement	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
Frbp. ped/bikes	1.00	1.00	1.00	1.00	1.00
Frbp. ped/bikes	1.00	1.00	1.00	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	0.85
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>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)	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)							None	None	None	None	None	None
Median type												
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%									B
Analysis Period (min)			15									

Movement	EBL	EBR	NBL	NBR	SBL	SBT	SBR
Lane Configurations	20	10	5	535	380	30	30
Traffic Volume (veh/h)	20	10	5	535	380	30	30
Future Volume (Veh/h)	20	10	5	535	380	30	30
Sign Control	Stop	Free	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	24	12	6	629	447	35	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	None
Median type							
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)							
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%				A
Analysis Period (min)			15				

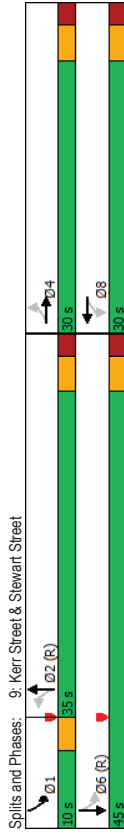


Timings 9: Kerr Street & Stewart Street

Future Total AM (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	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
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 Cap (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 Don't 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 (Ultimate)  
Upper Kerr Village (8/24-01)

	EBT	WBT	NBT	SBT
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

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 (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
Flb. ped/bikes	0.97	0.99	1.00	0.99	1.00	0.99	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	0.94	1.00	0.91	1.00	0.91	1.00	0.91	1.00	0.91
Flt Permitted	1388	1532	1769	1532	1769	1581	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	1	6	2	1	6	6
Protected Phases	4	8	2	8	2	2	1	6	2	1	6	6
Permitted Phases	15.2	15.2	49.0	15.2	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	0.20	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	281	1155	1032	1155	1032	1155	1032	1155	1032
Clearance Time (s)	0.05	0.05	0.31	0.05	0.31	0.29	0.31	0.29	0.31	0.29	0.31	0.29
Vehicle Extension (s)	0.26	0.27	0.48	0.26	0.48	0.45	0.48	0.45	0.48	0.45	0.48	0.45
Lane Grp Cap. (vph)	25.2	25.2	6.6	25.2	6.6	6.4	6.6	6.4	6.6	6.4	6.6	6.4
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	1.4	0.7	1.4	0.3	1.4	0.3	1.4	0.3	1.4	0.3
Uniform Delay, d1	25.9	25.9	8.0	25.9	8.0	6.7	8.0	6.7	8.0	6.7	8.0	6.7
Progression Factor	C	C	A	C	A	A	A	A	A	A	A	A
Incremental Delay, d2	25.9	25.9	8.0	25.9	8.0	6.7	8.0	6.7	8.0	6.7	8.0	6.7
Delay (s)	C	C	A	C	A	A	A	A	A	A	A	A
Level of Service	C	C	A	C	A	A	A	A	A	A	A	A
Approach Delay (s)	C	C	A	C	A	A	A	A	A	A	A	A
Approach LOS	C	C	A	C	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> <p>Critical Lane Group: c</p>											

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	1	6	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	Prot	NA	6	6
Protected Phases	7	4	3	8	2	2	1	6	2	1	6	6
Permitted Phases	7	4	3	8	2	2	1	6	2	1	6	6
Detector Phase	7	4	3	8	2	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 (s)	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	27.0	11.0	27.0	11.0	27.0	27.0	27.0
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 &amp; Wyecroft Road</p> <p>Ø1: 17 s (EBL) Ø2 (R): 42 s (WBL) Ø3: 21 s (WBT) Ø4: 40 s (WBR) Ø5: 17 s (EBT) Ø6 (R): 42 s (NBL) Ø7: 21 s (NBT) Ø8: 40 s (NBR)</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
Lane Configurations	TT	TT	T	T	TT	TT	TT	TT
Traffic Volume (vph)	215	120	100	20	130	250	110	1410
Future Volume (vph)	215	120	100	20	130	250	110	1410
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
Fpb. ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00
Frt	1.00	0.93	1.00	0.90	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	3079	1637	3125	1641	5036	3433	4672
Flt Permitted	0.95	1.00	0.60	1.00	0.08	1.00	0.95	1.00
Satd. Flow (perm)	3127	3079	1039	3125	140	5036	3433	4672
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	141	272	120	1533
RTOR Reduction (vph)	0	82	0	0	199	0	0	52
Lane Group Flow (vph)	234	157	0	22	214	0	120	1595
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		2			
Actuated Green, G (s)	14.9	29.3	22.2	18.3	61.1	49.5	13.3	51.2
Effective Green, g (s)	14.9	29.3	22.2	18.3	61.1	49.5	13.3	51.2
Actuated g/C Ratio	0.12	0.24	0.18	0.15	0.51	0.41	0.11	0.43
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	751	211	476	216	2077	380	1993
v/s Ratio Prot	c0.07	0.05	0.00	c0.07	c0.05	0.32	0.05	c0.33
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
Uniform Delay, d1	49.8	36.1	40.4	46.3	20.0	30.3	50.0	29.4
Progression Factor	1.00	1.00	1.00	1.00	1.18	0.64	1.00	1.00
Incremental Delay, d2	3.9	0.3	0.5	1.4	2.4	1.3	1.8	3.0
Delay (s)	53.6	36.4	40.9	47.7	26.0	20.6	51.8	32.4
Level of Service	D	D	D	D	C	C	D	C
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 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		73.9%		ICU Level of Service		D		
Analysis Period (min)		15						
c Critical Lane Group								

HCM Unsignalized Intersection Capacity Analysis  
 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					

Timings  
 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
Lead-Lag Optimize?					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: 49.1										
Natural Cycle: 65										
Control Type: Semi Ad-Uncoordinated										
Splits and Phases: 2: Kerr Street & Shepherd Road										
	01	02	03	04	05	06	07	08	09	10
	23.6	53.3	53.3	53.3	53.3	53.3	53.3	53.3	53.3	53.3

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)

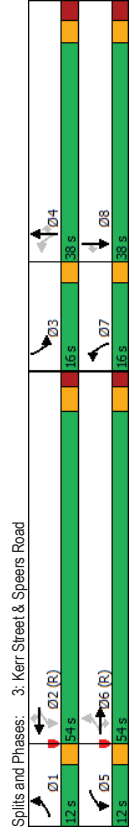
	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group	49	33	98	165	49	588	108	160	479
Lane Group Flow (vph)	0.22	0.10	0.40	0.39	0.14	0.43	0.16	0.27	0.21
v/c Ratio	19.9	11.2	23.1	8.1	12.1	12.7	3.7	5.0	4.6
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	19.9	11.2	23.1	8.1	12.1	12.7	3.7	5.0	4.6
Total 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	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
Frt	1.00	0.90	1.00	0.86	1.00	0.95	1.00	0.85	1.00
Frt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1770	1676	1732	1601	1770	3539	1543	1804	3574
Frt Permitted	0.65	1.00	0.74	1.00	0.48	1.00	0.34	1.00	1.00
Satd. Flow (perm)	1214	1676	1341	1601	891	3539	1543	638	3574
Peak-Hour factor, PHF	0.92	0.92	0.92	0.97	0.92	0.97	0.97	0.97	0.92
Adj. Flow (vph)	49	11	22	98	16	149	49	588	108
RTOR Reduction (vph)	0	18	0	0	121	0	0	66	0
Lane Group Flow (vph)	49	15	0	98	44	0	49	588	42
Confl. Peds. (#/hr)	2%	2%	3%	2%	1%	2%	1%	2%	0%
Heavy Vehicles (%)	0	0	0	0	0	0	0	0	0
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	pm-pt	NA
Protected Phases	4		8		2		1		6
Permitted Phases	4		8		2		2		6
Actuated Green, G (s)	9.2	9.2	9.2	9.2	9.2	19.0	19.0	30.6	30.6
Effective Green, g (s)	9.2	9.2	9.2	9.2	9.2	19.0	19.0	30.6	30.6
Actuated g/C Ratio	0.19	0.19	0.19	0.19	0.19	0.39	0.39	0.62	0.62
Clearance Time (s)	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	3.5	3.5	2.5	3.5
Lane Grp Cap (vph)	227	314	251	300	345	1372	598	579	2231
v/s Ratio Prot	0.04		c0.07		0.05	c0.17		c0.04	0.13
v/s Ratio Perm	0.22	0.05	0.39	0.15	0.14	0.43	0.07	0.28	0.21
Uniform Delay, d1	16.8	16.3	17.4	16.6	9.7	11.0	9.4	4.1	4.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.1	1.0	0.2	0.2	0.3	0.1	0.2	0.1
Delay (s)	17.3	16.4	18.4	16.8	9.9	11.3	9.5	4.3	4.0
Level of Service	B	B	B	B	A	B	A	A	A
Approach Delay (s)	16.9		17.4		10.9		4.1		A
Approach LOS	B		B		B		A		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

	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	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	6	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	6	2	2	7	7	7	4	4	8
Detector Phase	1	6	6	6	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

	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	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  
 HCM Signalized Intersection Capacity Analysis  
 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
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
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
Permitted Phases	1	6	5	2	2	7	4	4	3	8	8	8
Protected Phases	6	6	2	2	2	4	4	4	4	4	4	4
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)	58.4	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	0.04	0.09	c0.15	0.01	0.01
v/s Ratio Perm	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	HCM 2000 Control Delay: 31.4 HCM 2000 Level of Service: C HCM 2000 Volume to Capacity ratio: 0.73 Actuated Cycle Length (s): 120.0 Sum of lost time (s): 18.2 Intersection Capacity Utilization: 78.9% ICU Level of Service: D 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	4	3	8	1	5	2	1	6	6	
Detector Phase	7	4	4	3	8	1	5	2	1	6	6	
Switch Phase	7.0	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	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	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											



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											
Lane Group Flow (vph)	451	582	54	196	772	549	71	777	321	772	408
v/c Ratio	0.97	0.53	0.09	0.52	0.79	0.74	0.25	0.83	0.97	0.59	0.50
Control Delay	87.3	36.4	0.3	36.1	59.3	27.1	21.4	49.4	77.5	16.8	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.3	36.4	0.3	36.1	59.3	27.1	21.4	49.4	77.5	16.8	2.7
Queue Length 50th (m)	-59.7	59.5	0.0	30.5	79.5	42.1	9.2	88.4	-57.3	61.4	4.5
Queue Length 95th (m)	#91.8	77.1	0.0	63.4	118.4	107.4	17.7	111.6	#22.9	34.0	4.2
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)	464	1107	584	394	1034	738	279	974	331	1310	810
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
<b>Intersection Summary</b>											
~ 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	F	FF	F	
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	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	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	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		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		
<b>Intersection Summary</b>												
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)

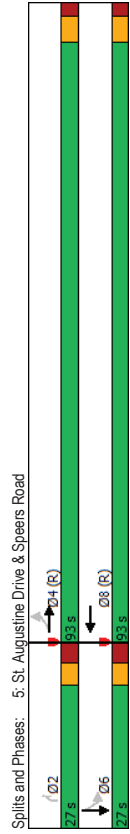
Future Total PM (Ultimate)  
Upper Kerr Village (8/24-01)

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	
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

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			93.6
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  
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

Intersection Summary  
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		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)	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	1.00	0.95	1.00	0.95	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			8							6
Permitted Phases	4								2	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)	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)	379	2990			2995				91	100		90
v/s Ratio Prot	0.23				c0.32							0.00
v/s Ratio Perm	0.29								0.00	c0.01		
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 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	58.6% ICU Level of Service B											
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	EBT	WBT	SBL	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	265	750	1340	10	420	
Future Volume (vph)	265	750	1340	10	420	
Turn Type	pm-plt	NA	NA	NA	Prot	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			
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 (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
Movement	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>pt	NA	NA	Prot	Perm
Protected Phases	5	2	6	4	
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

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 (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	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	C	C								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			61.2%									B
Analysis Period (min)			15									

8: Kerr Street & Elmwood Road

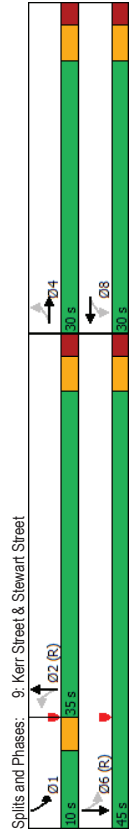
Future Total PM (Ultimate)

Upper Kerr Village (8/24-01)

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
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	C	C			
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			45.8%			
Analysis Period (min)			15			
						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	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		2	1	6	
Permitted Phases	4			8			2		2	1	6	
Actuated Green, G (s)	13.2			13.2			51.0		51.0	51.0	51.0	51.0
Effective Green, g (s)	13.2			13.2			51.0		51.0	51.0	51.0	51.0
Actuated G/C Ratio	0.18			0.18			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
Vehicle Extension (s)	4.0			4.0			4.0		4.0	4.0	4.0	4.0
Lane Grp Cap. (vph)	232			267			1245		1245	1141	1141	1141
V/S Ratio Prot												
V/S Ratio Perm	c0.05			0.03			0.26		0.26	c0.40	c0.40	c0.40
V/C Ratio	0.29			0.16			0.39		0.39	0.59	0.59	0.59
Uniform Delay, d1	26.8			26.2			5.2		5.2	6.4	6.4	6.4
Progression Factor	1.00			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	0.8
Delay (s)	27.8			26.5			6.1		6.1	7.3	7.3	7.3
Level of Service	C			C			A		A	A	A	A
Approach Delay (s)	27.8			26.5			6.1		6.1	7.3	7.3	7.3
Approach LOS	C			C			A		A	A	A	A
Intersection Summary												
HCM 2000 Control Delay	9.6 HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.56											
Actuated Cycle Length (s)	75.0 Sum of lost time (s)											
Intersection Capacity Utilization	82.5% ICU Level of Service											
Analysis Period (min)	15											
Critical Lane Group	c											

10: Donval Road & Wyecroft 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	4	4	4	4	4	4	4	4	4	4	4	4
Traffic Volume (vph)	385	225	60	95	495	95	1315	140	1170	140	1170	1170
Future Volume (vph)	385	225	60	95	495	95	1315	140	1170	140	1170	1170
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	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	None
Walk Time (s)	7.0			7.0			7.0		7.0		7.0	7.0
Flash Dont Walk (s)	11.0			11.0			27.0		27.0		27.0	27.0
Pedestrian Calls (#/hr)	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											

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	0.97	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
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	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
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	17
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	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
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	1.00	0.82	0.94	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)		66.5		52.7		39.7		29.4		29.4
Approach LOS		E		D		D		C		C

Intersection Summary	Value	Unit
HCM 2000 Control Delay	42.8	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.91	
Actuated Cycle Length (s)	120.0	Sum of lost time (s)
Intersection Capacity Utilization	84.2%	ICU Level of Service
Analysis Period (min)	15	
c Critical Lane Group		