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Memorandum

To/Attention	Sarah Grady, P.Eng. Traffic and Transportation Engineer Transportation Planning and Design City of London	**Date**	December 5, 2023
From	David Hook	**Project No**	136632
cc	David Ailles - York Developments Dhaval Harpal - City of London Juan Chamorra - City of London		
Subject	Kilbourne Subdivision - Site-Specific Transportation Assessment		

Arcadis IBI Group was retained by Kilbourne Developments Inc. to undertake a Transportation Assessment in support of the proposed Kilbourne Subdivision, located east of Bostwick Road within the Bostwick neighbourhood of the City of London, Ontario.

In conjunction with this memorandum, Arcadis IBI Group was also contracted to undertake the Bostwick Road Area Master Transportation Study (MTS) which provides analysis of the regional traffic impacts of three major developments in the area, including the subject site. As the regional traffic impacts of the proposed development have already been addressed as part of the MTS, this assessment focuses on the localized impacts such as site access intersections, major internal intersections and specific transportation considerations of the proposed development.

This site-specific assessment will therefore address the following items:

- Description of the proposed development
- Proposed transportation network
- Site access and major internal intersection configuration, intersection capacity analysis and geometric requirements
- Transportation Demand Management (TDM)
- Traffic calming measures
- Pedestrian crossovers
- Cycling facility selection

Proposed Development

The Kilbourne Subdivision is bound by Bostwick Road to the west, a hydro corridor and existing commercial developments on Wonderland Road South to the east, Wharncliffe Road South to the south and the 3080 Bostwick Road development to the north. The proposed development occupies the following municipal addresses: 3514 Bostwick Rd, 3313 Wonderland Rd S, 3341 Wonderland Rd S and 1875 Wharncliffe Rd S.

The location of the subject subdivision and adjacent developments within its vicinity are illustrated in **Exhibit 1** below.

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Exhibit 1:
Site Location and
Adjacent Developments

PROJECT No. 136632

SCALE: 0m 250m 500m

Consistent with the Bostwick MTS, the proposed development has been divided into eight subzones. **Table 1** summarizes the land use statistics and anticipated buildout years for each subzone. Construction of this development is anticipated to begin in 2024, with full buildout anticipated in 2035. **Exhibit 2** below illustrates the layout of the proposed development and outlines the extents of each subzone.

Table 1 - Land Use and Phasing

Subzone	Construction	Land Use	Size
A	N/A	Greenspace	N/A
B	2024 to 2026	Street Townhomes	10 units
		Cluster Housing (3-6 storeys)	226 units
		Mid-Rise Apartments (6-10 storeys)	92 units
C	2025 to 2030	Single Family Homes	93 units
		Mid-Rise Apartments (6-10 storeys)	310 units
D	2024 to 2026	Single Family Homes	41 units
		Street Townhomes	9 units
		Mid-Rise Apartments (6-10 storeys)	30 units
E	2024 to 2030	Single Family Homes	145 units
		Street Townhomes	8 units
		Cluster Housing (3-6 storeys)	26 units
		Mid-Rise Apartments (6-10 storeys)	330 units
F	2025 to 2028	Single Family Homes	209 units
		Street Townhomes	39 units
		Cluster Housing (3-6 storeys)	67 units
		High-Rise Apartments (11+ storeys)	538 units
G	2025 to 2030	Cluster Housing (3-6 storeys)	76 units
H	2030 to 2035	Street Townhomes	147 units
		Cluster Housing (3-6 storeys)	157 units
		High-Rise Apartments (11+ storeys)	538 units
		Cluster Housing (3-6 storeys) (Future Development)	50 units
Total			**3,141 units**

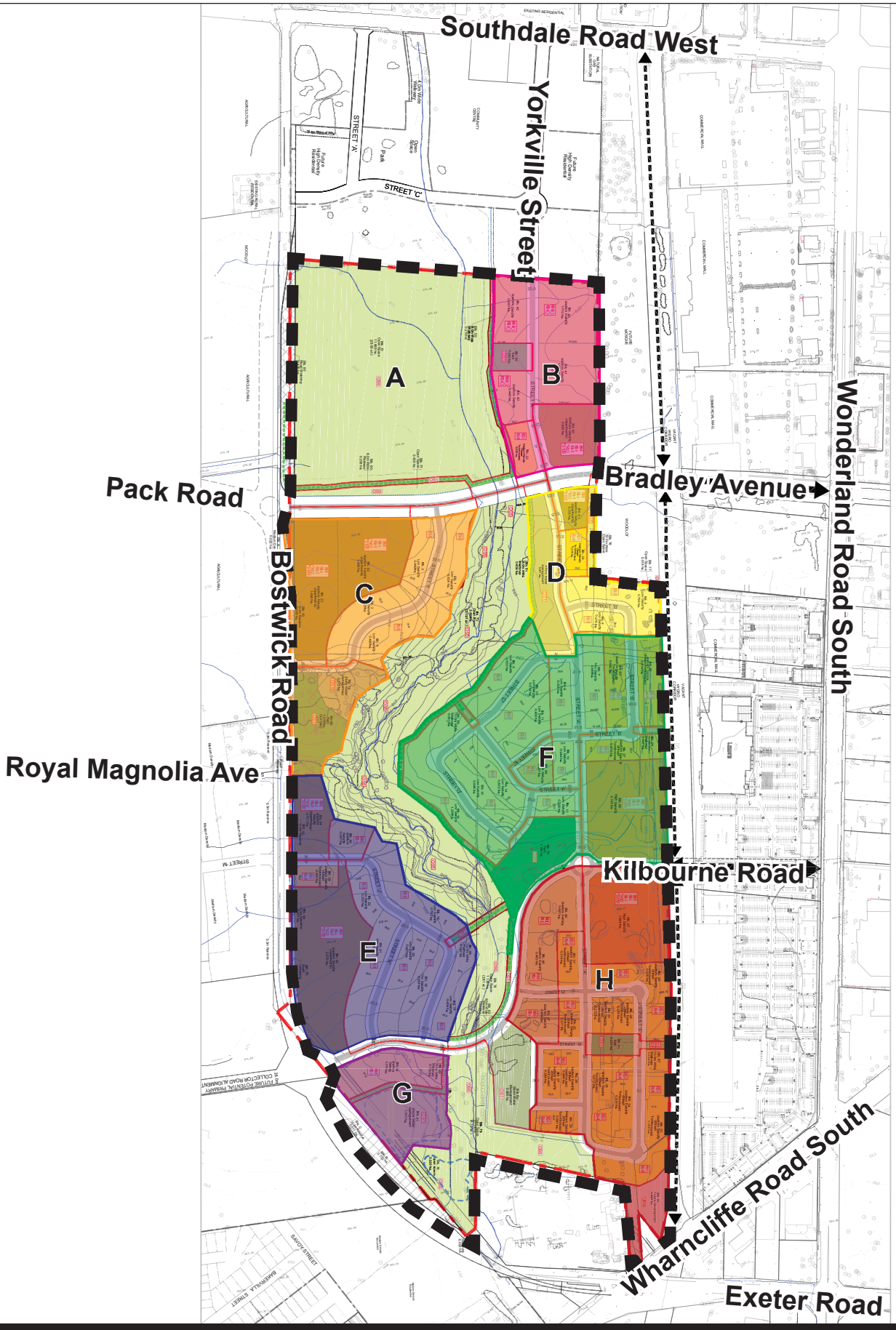

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Exhibit 2:
Proposed Development

PROJECT No. 136632

SCALE: 0m 100m 200m

Proposed Road Network

The internal road network within the proposed development will consist of three primary roads: Bradley Avenue, Kilbourne Road and Yorkville Street. Bradley Avenue is an Urban Thoroughfare with a right-of-way (ROW) width of 36.0m, Kilbourne Road is a Neighbourhood Connector with a ROW width of 23m, and Yorkville Street is a local road with a ROW width of 20m. Both Bradley Avenue and Kilbourne Road will extend east-west through the proposed development providing connections between Bostwick Road and Wonderland Road, while Yorkville Street will extend north-south from Southdale Road to south of Kilbourne Road. All other streets within the proposed development will be classified as local roads each with 20m ROWs.

Access to the site will be provided via a number of major and minor access intersections, as well as two major internal intersections:

- Major access intersections:
    - Wonderland & Bradley (existing)
    - Bostwick & Pack/Bradley (existing)
    - Southdale & Yorkville (existing)
    - Wonderland & Kilbourne (existing)
    - Bostwick & Kilbourne (future)
- Minor access intersections:
    - Bostwick & Street ‘I’ (future)
    - Bostwick & Street ‘J’ (future)
    - Bradley & Street ‘I’ (future)
- Major internal intersections:
    - Bradley & Yorkville (future)
    - Kilbourne & Yorkville (future)

As a result of the high traffic volumes and future four-lane divided cross-section on Bostwick Road, it is assumed that both minor access intersections at Street ‘I’ and Street ‘J’ will be restricted to right-in/right-out turning movements only for safety purposes. This is consistent with the overall distribution of area-wide traffic analyzed as part of the MTS. It is expected that the Bradley & Street ‘I’ intersection can be configured as a full-movement intersection as traffic volumes on Bradley Avenue are expected to be much lower than on Bostwick Road.

Exhibit 3 below illustrates the proposed road network within the development.

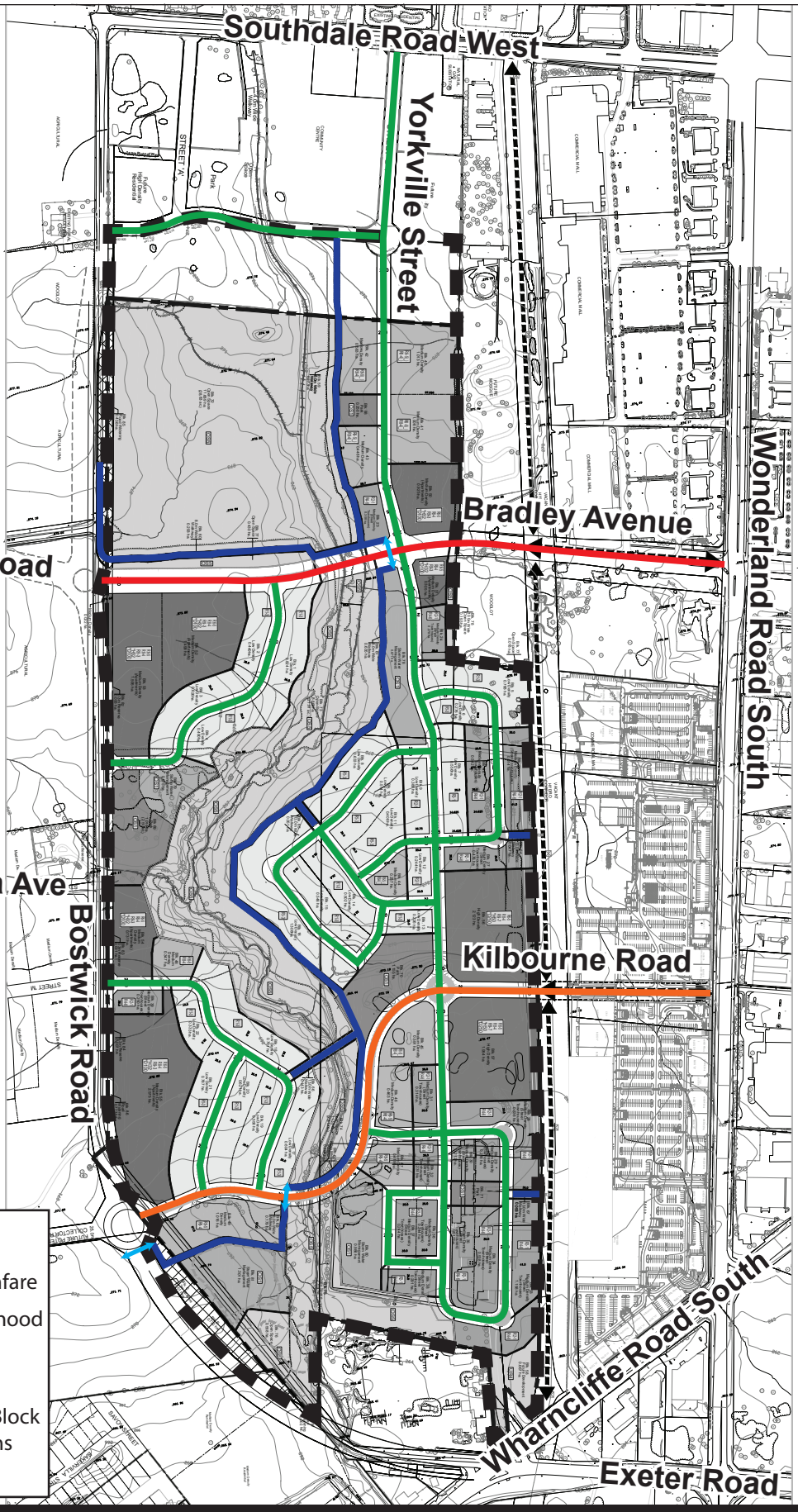

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Exhibit 3:
Proposed
Road Network

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SCALE: 0m 100m 200m

Pedestrian & Cycling Facilities

There are currently no pedestrian facilities along the boundary streets (Bostwick Road, Pack Road and Wharncliffe Road South). The Bostwick Environmental Assessment (EA) indicates that concrete sidewalks will be provided on both sides of Bostwick Road when it is widened in 2026. It is unknown what pedestrian facilities will be provided along Pack Road when it is urbanized in 2032. It is expected that concrete sidewalks will be provided on both sides of Yorkville Street, Bradley Avenue, Kilbourne Road and all local streets within the subdivision.

In terms of cycling facilities, there are currently cycle tracks on both sides of Wonderland Road as well as on both sides of the segment of Southdale Road between Bostwick Road/Farnham Road and Pine Valley Boulevard. The Bostwick MTS indicates that grade-separated cycling facilities will eventually be provided along Wharncliffe, Bostwick, Pack, and the future extension of Bradley. A bi-directional cycle track exists along the south side of Bradley Avenue, east of Wonderland Road, and it is therefore assumed that this configuration will be maintained through the Kilbourne Subdivision as well.

A recent technical amendment to the Cycling Master Plan (CMP) has also identified the need for cycling facilities along the segment of Kilbourne Road within the proposed development. Kilbourne Road has been reviewed in further detail in a subsequent section of this study to determine what type of cycling facility will be appropriate for this street.

Within the proposed development, right-of-way has been protected for a multi-use path (MUP) adjacent to the Thornicroft Drain in accordance with the Southwest Area Plan (SWAP), as well as along the north side of Bradley Avenue (west of the Thornicroft Drain). ROW has also been allocated for mid-block pathway connections between internal roadways and the MUP. The planned MUP adjacent to the Thornicroft Drain will cross Bradley Avenue, Kilbourne Road and Bostwick Road. These three locations may therefore be good candidates for pedestrian crossovers (PXOs) and have been reviewed in further detail in a subsequent section of this study.

The planned MUP network will also extend westwards and cross Bostwick Road at the intersection with Royal Magnolia Avenue. As discussed in the Westwinds Subdivision Site-Specific Transportation Assessment (Arcadis IBI Group, August 2023), it is expected that crossing facilities for this MUP will be integrated into the future design of a signalized intersection at this location.

Future Transit Service

The Bostwick MTS indicates that transit service will eventually be provided along Wonderland, Wharncliffe, Southdale, Bostwick, Pack, and the future extension of Bradley. It is therefore expected that bus stops will be provided internally on Bradley Avenue, as well as on all major roadways surrounding the proposed development. Based on the planned phasing for the proposed development, it is recommended that transit service be extended to Bostwick Road by 2024 and along Bradley Avenue by 2028 to accommodate the travel demands of this new community and establish a high transit mode share upon first occupancy. Furthermore, to ensure adequate transit coverage, it is also recommended that transit service be provided along Kilbourne Road when it is constructed in 2025. In order to bring the majority of the subdivision residents within a 400m (5-minute) walking distance of transit, it is recommended that transit stops be provided at the following locations:

- Bostwick & Pack/Bradley
- Bostwick & Street ‘I’
- Bostwick & Street ‘J’
- Bostwick & Kilbourne

- Bradley & Yorkville
- Kilbourne & Yorkville

With the implementation of the above, it is anticipated that the mode share targets identified in the Bostwick MTS will be achieved.

Intersection Capacity Analysis

The Bostwick MTS provides a detailed analysis of the regional traffic impacts of the proposed development, including the major access intersections, and therefore the following analysis focuses on the intersection capacity of the minor site accesses and the major internal intersections:

- Bostwick & Street 'I'
- Bostwick & Street 'J'
- Bradley & Street 'I'
- Bradley & Yorkville
- Kilbourne & Yorkville

As noted previously in **Table 1**, the majority of the subzones of the proposed development will be fully built-out by 2030, with only Subzone H expected to be fully built-out later in 2035. Traffic operations at the study intersections were therefore evaluated under the following traffic conditions:

- Future (2030) Total Traffic
- Future (2035) Total Traffic

The above analysis years have been selected to align with the analysis years from the Bostwick MTS. As only the minor site accesses and major internal intersections have been evaluated, no analysis of background traffic conditions has been undertaken as these intersections would not exist under background conditions.

The proposed development will be predominantly residential therefore only the weekday morning and afternoon peak hours have been analysed as the combined impact of site-generated and background traffic is expected to be highest during these periods.

Future (2030 & 2035) Total Traffic volumes were calculated by using the vehicle trip generation estimates and distribution from the Bostwick MTS to assign site-generated traffic to the site access intersections and superimposing these volumes over the background traffic from the Bostwick MTS. The resulting Future (2030 & 2035) Total Traffic volumes are illustrated in **Exhibit 4** and **Exhibit 5**.

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Exhibit 4:
Future (2030) Total Traffic

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SCALE: N.T.S.

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Exhibit 5:
Future (2035) Total Traffic

PROJECT No. 136632

SCALE: N.T.S.

The City of London Transportation Impact Assessment (TIA) Guidelines indicate that intersections and movements with a v/c ratio greater than 0.90 or Level of Service (LOS) 'E' or worse should be identified, along with 95th percentile queues that exceed the available storage capacity.

Traffic operations at all study area intersections were evaluated using Synchro v11. The results of the intersection capacity analysis under Future (2030 & 2035) Total Traffic conditions are presented in **Table 2** and **Table 3** below. Detailed intersection capacity analysis reports are provided in **Appendix A**.

Table 2 - Intersection Capacity Analysis Results: Future (2030) Total Traffic

Intersection	Traffic Control	Lane Group	Storage (m)	AM Peak Hour (PM Peak Hour)					
				Int. Delay	Int. LOS	Delay (s)	LOS	v/c Ratio	95th Percentile Queue (m)
Bostwick & Street 'I'	Stop-Control[1] (on Street 'I)	WBR	-	10.3 (12.4)	B (B)	10.3 (12.4)	B (B)	0.05 (0.05)	1.4 (0.7)
Bostwick & Street 'J'	Stop-Control[1] (on Street 'J')	WBR	-	9.4 (13.1)	A (B)	9.4 (13.1)	A (B)	0.05 (0.06)	0.7 (1.4)
Bradley & Street 'I'	Stop-Control (on Street 'I')	NBRL	-	10.6 (11.1)	B (B)	10.6 (11.1)	B (B)	0.06 (0.05)	1.4 (0.7)
		WBL	15			8.1 (8.2)	A (A)	0.02 (0.05)	0.7 (1.4)
Bradley & Yorkville	Two-Way Stop-Control (on Yorkville)	NBTRL	-	16.1 (23.7)	C (C)	11.7 (12.6)	B (B)	0.18 (0.14)	4.9 (3.5)
		EBL	15			7.7 (8.5)	A (A)	0.02 (0.04)	0.7 (0.7)
		WBL	15			8.1 (8.2)	A (A)	0.03 (0.08)	0.7 (2.1)
		SBTRL	-			16.1 (23.7)	C (C)	0.35 (0.42)	10.5 (14.0)
Kilbourne & Yorkville	Two-Way Stop-Control (on Yorkville)	NBTRL	-	9.1 (9.3)	A (A)	- (-)	A (A)	- (-)	- (-)
		EBL	-			7.3 (7.4)	A (A)	0.00 (0.00)	- (-)
		WBL	-			- (-)	A (A)	- (-)	- (-)
		SBTRL	-			9.1 (9.3)	A (A)	0.06 (0.05)	1.4 (1.4)

Note[1] – Right-in/right-out access only.

The results of the intersection capacity analysis indicate that all of the study area intersections are expected to operate at an acceptable Level of Service (i.e. LOS 'D' or better and v/c ratio of 0.90 or less) as stop-controlled intersections.

It should be noted that the two main internal junctions (Bradley & Yorkville and Kilbourne & Yorkville) are shown to operate at an excellent Level of Service as two-way stop-controlled intersections with free flow in the east-west direction. The Draft Plan of Subdivision indicates potential roundabouts at these

intersections. Although not required, the provision for roundabouts at these intersections will be discussed in the Traffic Calming section of this memorandum.

Table 3 - Intersection Capacity Analysis Results: Future (2035) Total Traffic

Intersection	Traffic Control	Lane Group	Storage (m)	AM Peak Hour (PM Peak Hour)					
				Int. Delay	Int. LOS	Delay (s)	LOS	v/c Ratio	95th Percentile Queue (m)
Bostwick & Street 'I'	Stop-Control[1] (on Street 'I)	WBR	-	10.3 (12.4)	B (B)	10.3 (12.4)	B (B)	0.05 (0.05)	1.4 (0.7)
Bostwick & Street 'J'	Stop-Control[1] (on Street 'J')	WBR	-	9.4 (13.1)	A (B)	9.4 (13.1)	A (B)	0.05 (0.06)	0.7 (1.4)
Bradley & Street 'I'	Stop-Control (on Street 'I')	NBRL	-	10.6 (11.3)	B (B)	10.6 (11.3)	B (B)	0.06 (0.05)	1.4 (0.7)
		WBL	15			8.1 (8.3)	A (A)	0.02 (0.05)	0.7 (1.4)
Bradley & Yorkville	Two-Way Stop-Control (on Yorkville)	NBTRL	-	16.2 (24.0)	C (C)	12.7 (14.2)	B (B)	0.23 (0.19)	6.3 (4.9)
		EBL	15			7.7 (8.5)	A (A)	0.02 (0.04)	0.7 (0.7)
		WBL	15			8.1 (8.2)	A (A)	0.03 (0.08)	0.7 (2.1)
		SBTRL	-			16.2 (24.0)	C (C)	0.35 (0.42)	10.5 (14.0)
Kilbourne & Yorkville	Two-Way Stop-Control (on Yorkville)	NBTRL	-	10.6 (11.6)	B (B)	9.2 (9.2)	A (A)	0.11 (0.07)	2.8 (1.4)
		EBL	-			7.3 (7.4)	A (A)	0.00 (0.00)	- (-)
		WBL	-			7.3 (7.4)	A (A)	0.02 (0.05)	0.7 (1.4)
		SBTRL	-			10.6 (11.6)	B (B)	0.09 (0.10)	2.1 (2.1)

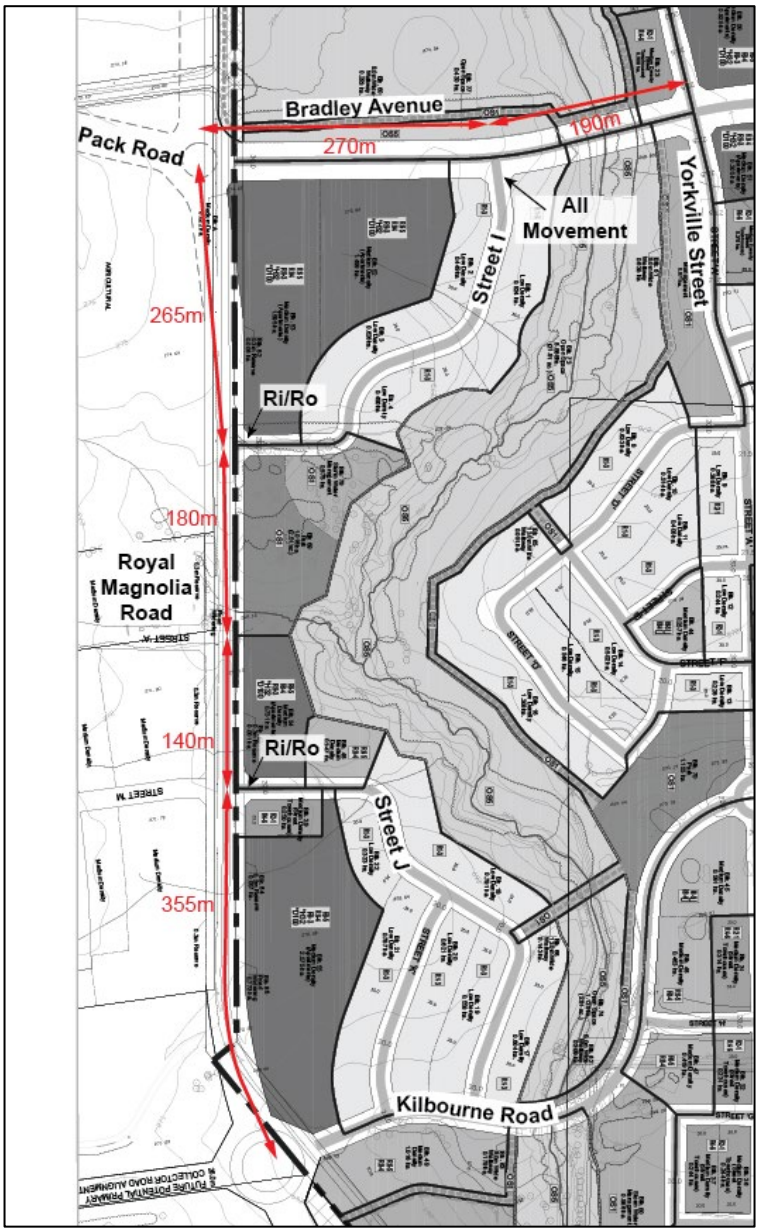
Note[1]- Right-in/right-out access only.

Under Future (2035) Total Traffic conditions, all study area intersections are expected to continue operating at an acceptable Level of Service.

Geometric Review

The distances from the proposed minor site accesses to other the existing and future intersections are summarized below in **Figure 1**.

Figure 1 - Proposed Access Locations



The City of London Access Management Guidelines classify all development intersections as major access connections. Assuming a future design speed of 80 km/h (posted speed limit plus 10 km/h) along Bostwick Road and 70 km/h along Bradley Avenue, the following geometric requirements are applicable to the site access intersections:

Table 4 - Geometric Requirements

Geometric Requirement	Distance Required/ Recommended
Sight Distance Requirements	
Minimum Intersection Sight Distance[1] (Right-In/Right-Out Intersections)	145m
Minimum Intersection Sight Distance[1] (Full-Movement Intersections)	150m
Minimum Decision Sight Distance[2]	325m
Intersection Spacing Requirements	
Minimum Spacing Required between Major Access Connections[2] (Right-In/Right-Out Intersections)	75m
Minimum Spacing Required between Major Access Connections[2] (Full-Movement Intersections)	200m

Notes:

[1] – Based on the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads.

[2] – Based on the City of London Access Management Guidelines.

The sight distance requirements were reviewed at the three proposed access intersections and the results are summarized in **Table 5**.

Table 5 - Sight Distance Requirement Compliance

Location	Sight Distance Requirement Compliance	
	Minimum Intersection Sight Distance	Minimum Decision Sight Distance
Bostwick & Street 'I'	✓	✓
Bostwick & Street 'J'	✓	✓
Bradley & Street 'I'	✓	✓

A desktop review of the sightlines from the site access intersections indicates that both sight distance requirements are met.

The intersection spacing requirements were also reviewed for the three proposed site access intersections. As shown in **Figure 1**, both of the right-in/right-out access intersections on Bostwick Road are well in excess of 75m from the nearest intersections. The Bradley & Street 'I' intersection is 10m short of meeting the recommended intersection spacing from the Bradley & Yorkville intersection. Given the small magnitude of this deficiency, however, it is not expected that the location of this intersection will create any significant operational issues.

Left- and right-turn auxiliary lane warrant analysis was conducted in accordance with the City of London Access Management Guidelines for the two major internal intersections and the Bradley & Street 'I' intersection. Right-turn auxiliary lane warrant analysis was also conducted for the Street 'I' and Street 'J' accesses on Bostwick.

The results of the left- and right-turn auxiliary lane analysis indicates that the following auxiliary lanes are warranted:

- Bradley & Yorkville:
    - Eastbound left-turn: 15m of storage
    - Westbound left-turn: 15m of storage
    - Westbound right-turn taper
- Bradley & Street 'I'
    - Westbound left-turn: 15m of storage

The results of the auxiliary left-turn lane warrant analysis are provided in **Appendix B**.

Transportation Demand Management (TDM)

The Bostwick MTS identifies a number of Transportation Demand Management (TDM) measures that the City of London is undertaking to manage traffic demand. To support these City-initiated TDM measures, a multi-modal information package will be provided by the Developer to all new residents upon first occupancy to highlight the range of alternative transportation options available in the area. This package may include information about local pathways, bicycle infrastructure, nearby services and amenities, nearby bus stops/routes/schedule, schools, local taxi companies, etc. The intent of this package is to provide new residents with options to get around their new community without reliance on a private automobile and establish sustainable travel behaviors early on.

Traffic Calming Measures

The layout of the internal road network has been assessed to determine the appropriateness of traffic calming measures. Based on the proposed roadway layout, it is likely that Kilbourne Road may represent an attractive route to Wonderland for developments west of Bostwick Road. Despite the planned frequency of residential driveways and on-street parking, traffic calming measures such as mid-block or intersection narrowings and/or speeds humps may act as a deterrent to cut-through traffic. Any traffic-calming strategies, whether horizontal or vertical measures, should take into consideration the potential for the street to accommodate public transit and cyclists as well as future designations as primary emergency response routes.

The majority of the local roads within the proposed development have a circuitous roadway alignment and relatively short segments which will discourage excessive speeds. Yorkville Street, however, has several sections over 450m long between intersections with a relatively straight alignment and should also be considered for traffic calming measures.

The following measures are also recommended:

- Reduced curb radii of 5-7m at all local-local intersections, where appropriate
- Reduced curb radii of 9m at all local-collector and local-arterial intersections, where appropriate
- Strategically located intersection narrowings to 6-6.5m at select local-local intersections
- Strategically located mid-block narrowings to 6-6.5m at minimum 100m-frequency along Yorkville Street

The above measures can be combined with vertical deflection (i.e., speed humps) on roads not intended to be used as transit routes. Traffic calming measures will be incorporated into the subdivision roadway design following draft approval of the subdivision.

As noted previously, the two main junctions within the subdivision (Bradley & York and Kilbourne & York) have been shown to operate at LOS ‘C’ or better as two-way stop-controlled intersections. Although not required from an intersection capacity perspective, it is recommended that roundabouts be considered at each of these location as traffic calming measures within the community while also providing an opportunity to establish pedestrian crossings on all legs at these locations.

A conceptual traffic calming and mobility plan is illustrated in **Exhibit 6** below.

With respect to the broader area, the City of London is currently implementing an Area Speed Limits program to lower speed limits to 40 km/h on roads with high levels of pedestrian and cycling activity. Within the Southwest Area of London, area speed limits have been implemented within the area bound by Westdel Bourne, Oxford, Commissioners, Boler and Byron Baseline as well as the area bound by Wonderland, Southdale, White Oak and Exeter.

In order to ensure that walking and cycling are attractive and safe modes of transportation for residents of the proposed development, it is recommended that Area Speed Limits be implemented for the area bound by Colonel Talbot, Southdale, Wonderland, Wharncliffe and Main, with exceptions for Bostwick Road, Pack Road and Bradley Avenue.

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Exhibit 6:
Traffic Calming
and Mobility Plan

PROJECT No. 136632

SCALE: 0m 90m 180m

Pedestrian Crossovers (PXOs)

Based on the integration of the area pathway network through the proposed development as shown on **Exhibit 3**, there are three locations that may potentially warrant a pedestrian crossover:

- The multi-use path (MUP) crossing on Bradley Avenue at Yorkville Street; and
- The multi-use path (MUP) crossing on Kilbourne Road, approximately 240m east of Bostwick Road.
- The multi-use path (MUP) crossing on Bostwick Road at Kilbourne Road.

Based on Ontario Traffic Manual (OTM) Book 15: Pedestrian Crossing Facilities, PXOs are warranted on the basis of traffic volumes, system connectivity and the lack of alternative crossing locations. Book 15 also indicates that traffic signal warrants should also be assessed to identify whether a higher-level form of traffic control may be warranted. Given that the future pedestrian crossing volumes at the three potential PXO locations are unknown, traffic signal warrant analysis cannot be completed and the warrants for PXOs will need to be assessed based solely on the need for system connectivity and lack of alternative signal-controlled crossings within 200m.

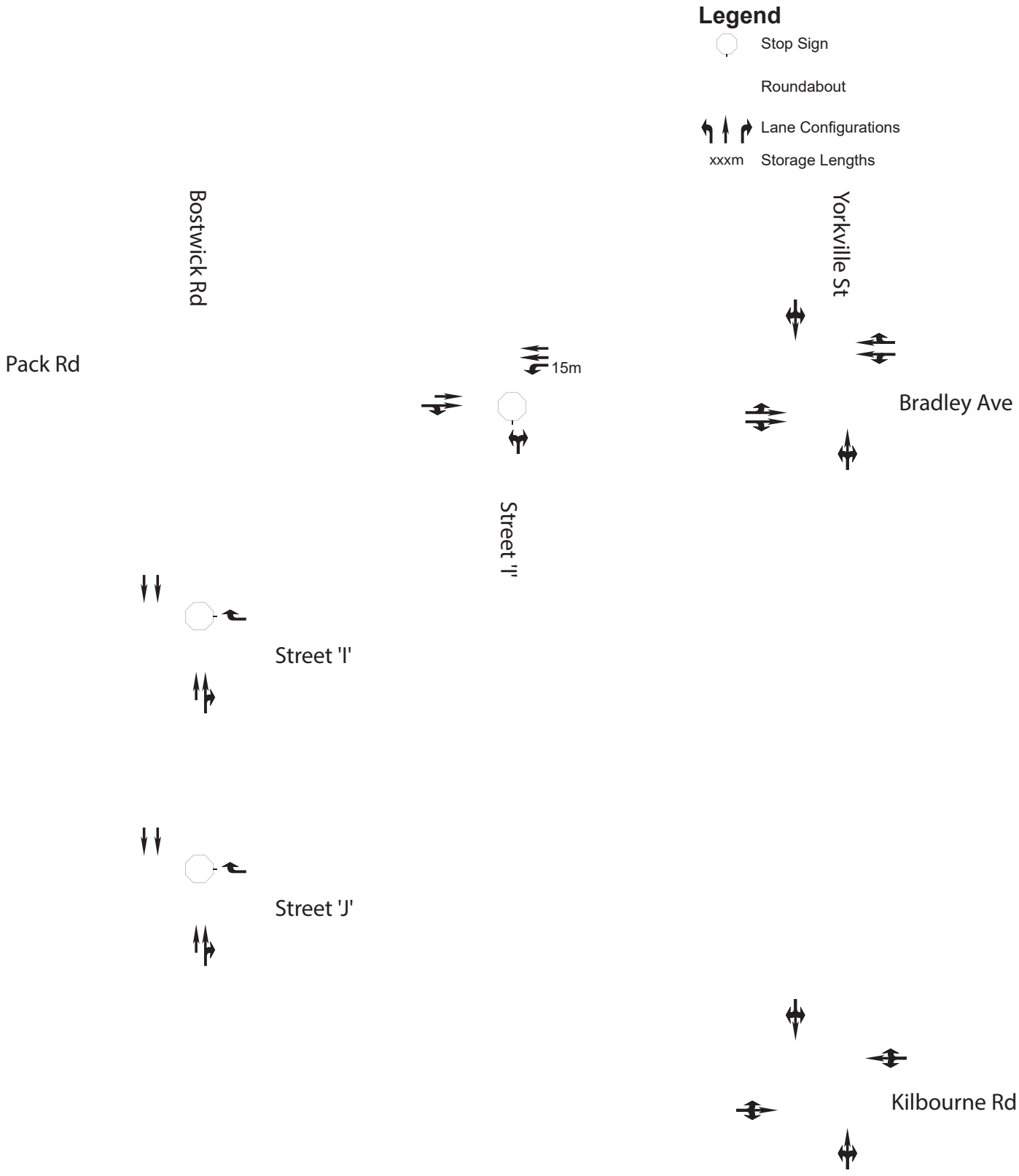
Given that the potential PXO locations on Bradley Avenue, Kilbourne Road and Bostwick Road are located along a planned MUP which will form part of the primary active transportation network in the area, there is a need for system connectivity at all three locations. The three crossings are also well in excess of 200m from alternative signal-controlled pedestrian crossings and therefore meet the warrants for a PXO, as indicated in the Decision Support Tool.

The PXO selection matrix from OTM Book 15 provides direction on which PXO configuration is appropriate at each location based on traffic volumes, posted speed limit, crossing distance and the presence or absence of a median refuge. As the potential PXO locations on Bradly Avenue and Kilbourne Road are located on future roadways, 8-hour volume projections were derived using the methodology provided in OTM Book 12: Traffic Signals. The resulting 8-hour traffic volumes along Bradley Avenue and Kilbourne Road are estimated to be in the order of 2,900 and 400 vehicles/8-hours, respectively. Bostwick Road is an existing roadway and based on 8-hour traffic counts conducted at the Bostwick & Pack intersection, two-way 8-hour traffic volumes at the proposed PXO location are in the order of 4250 vehicles/8-hours.

Bostwick Road is expected to be widened to a four-lane cross-section with a dividing median and the Bradley Avenue extension will have a similar roadway configuration. The dividing medians can serve as median refuges and therefore Level 2 Type C PXOs are recommended for the MUP crossings on Bradley Avenue and Bostwick Road. For the MUP crossing on Kilbourne Road, a Level 2 Type D PXO is recommended. Curb extensions should be utilized on Kilbourne Road to ensure the crossing distance does not exceed a total of 7.5m.

The PXO Decision Support Tool and Selection Matrix can be found in **Appendix C**.

Exhibit 7 illustrates the recommended traffic controls and lane configurations at the minor site access intersections and major internal intersections based on the results of the intersection capacity analysis, geometric review, traffic calming review and PXO warrants.



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Kilbourne Subdivision
Site-Specific Memorandum

Exhibit 7:
Recommended Intersection Traffic Controls and Lane Configurations

PROJECT No. 136632

SCALE: N.T.S.

Cycling Facility Selection

As discussed previously, a recent technical amendment to the Cycling Master Plan has identified the need for cycling facilities along Kilbourne Road. OTM Book 18: Cycling Facilities provides a nomograph as well as tables for determining what type of cycling facility will be appropriate for a given urban or suburban roadway based on the posted speed limit and average daily traffic volumes.

It is assumed that a 40 km/h speed limit will be applied to Kilbourne Road. Based on equations from OTM Book 12 that convert hourly volumes to estimated daily volumes, it is anticipated that average daily traffic on Kilbourne Road will be in the order of 2,300 vehicles east of Yorkville Street. With consideration of the above, the OTM Book 18 nomograph suggests that a mixed-traffic cycling facility such as advisory bicycle lanes would be appropriate for Kilbourne Road. It is therefore recommended that this type of facility be implemented along Kilbourne Road within the proposed development.

Conclusion

The proposed Kilbourne Subdivision will include approximately 3,100 residential units and is expected to achieve full occupancy by 2035 and will ultimately generate up to 922 vehicles per hour during the weekday morning and afternoon peak hours. This traffic will be distributed in many directions with access to/from the adjacent arterial road network by three primary routes: Bradley Avenue, Kilbourne Avenue and Yorkville Street.

The results of the intersection capacity analysis indicate that all minor site access intersections and the two major internal intersections are anticipated to operate at Level of Service 'D' or better within the timeframe of this study. A westbound left-turn lane with a minimum of 15m of storage is warranted for the Bradley & Street 'I' intersection.

A desktop review of intersection sight distances and intersection spacing for the proposed site access locations indicates that the Bradley & Street 'I' intersection is 10m short of meeting the recommended intersection spacing. Given the small magnitude of this deficiency, however, it is not expected that this will result in any significant operational issues.

A number of traffic calming measures are recommended to discourage cut-through traffic and excessive speeds. These recommended measures include mid-block and intersection narrowings, speed humps, reduced curb radii and the implementation of Area Speed Limits for the area bound by Colonel Talbot, Southdale, Wonderland, Wharncliffe and Main. In addition, consideration for implementation of roundabouts should be given to the two major internal intersections (Bradley & Yorkville and Kilbourne & Yorkville) for the purposes of traffic calming though not required for intersection capacity.

Locations where a planned MUP crosses Bradley Avenue, Bostwick Road and Kilbourne Road have been reviewed to assess the suitability of these crossing locations for PXOs. It is recommended that a Level 2 Type C PXO be provided where the future MUP crosses Bradley Avenue and Bostwick Road while a Level 2 Type D PXO is recommended for where the MUP crosses Kilbourne Road.

With regards to planned cycling facilities, Kilbourne Road has been assessed to determine what form of cycling facility would be appropriate along this corridor. Based on the results of the review, it is recommended that advisory bicycle lanes be provided on Kilbourne Road within the proposed development.

The overall conclusion of the Kilbourne Subdivision Site-Specific Transportation Assessment is that the proposed development can be accommodated by the adjacent road network with consideration of the above recommendations.

Prepared by:

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Appendix A – Intersection Capacity Analysis

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	36	576	2	0	959
Future Vol, veh/h	0	36	576	2	0	959
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	6	0	0	2
Mvmt Flow	0	36	576	2	0	959

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	289	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	714	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	714	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	714	-
HCM Lane V/C Ratio	-	-	0.05	-
HCM Control Delay (s)	-	-	10.3	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.2	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	40	305	14	0	981
Future Vol, veh/h	0	40	305	14	0	981
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	6	0	0	2
Mvmt Flow	0	40	305	14	0	981

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	160	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	863	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	863	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	863	-
HCM Lane V/C Ratio	-	-	0.046	-
HCM Control Delay (s)	-	-	9.4	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	357	5	19	212	11	30
Future Vol, veh/h	357	5	19	212	11	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	15	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	376	5	20	223	12	32

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	381	0	531	191
Stage 1	-	-	-	-	379	-
Stage 2	-	-	-	-	152	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1189	-	483	825
Stage 1	-	-	-	-	668	-
Stage 2	-	-	-	-	866	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1189	-	475	825
Mov Cap-2 Maneuver	-	-	-	-	475	-
Stage 1	-	-	-	-	668	-
Stage 2	-	-	-	-	851	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	689	-	-	1189	-
HCM Lane V/C Ratio	0.063	-	-	0.017	-
HCM Control Delay (s)	10.6	-	-	8.1	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	351	11	31	161	44	28	0	94	130	0	42
Future Vol, veh/h	25	351	11	31	161	44	28	0	94	130	0	42
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	15	-	-	15	-	15	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	25	351	11	31	161	44	28	0	94	130	0	42

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	205	0	0	362	0	0	550	674	181	449	635	81
Stage 1	-	-	-	-	-	-	407	407	-	223	223	-
Stage 2	-	-	-	-	-	-	143	267	-	226	412	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1378	-	-	1208	-	-	422	379	837	498	399	969
Stage 1	-	-	-	-	-	-	597	601	-	765	723	-
Stage 2	-	-	-	-	-	-	851	692	-	762	598	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1378	-	-	1208	-	-	390	362	837	427	381	969
Mov Cap-2 Maneuver	-	-	-	-	-	-	390	362	-	427	381	-
Stage 1	-	-	-	-	-	-	586	590	-	751	704	-
Stage 2	-	-	-	-	-	-	793	674	-	664	587	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	1.1	11.7	16.1
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	663	1378	-	-	1208	-	-	495
HCM Lane V/C Ratio	0.184	0.018	-	-	0.026	-	-	0.347
HCM Control Delay (s)	11.7	7.7	-	-	8.1	-	-	16.1
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.7	0.1	-	-	0.1	-	-	1.5

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	36	0	0	19	17	0	0	0	54	0	3
Future Vol, veh/h	1	36	0	0	19	17	0	0	0	54	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	1	36	0	0	19	17	0	0	0	54	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	36	0	0	36	0	0	67	74	36	66	66	28
Stage 1	-	-	-	-	-	-	38	38	-	28	28	-
Stage 2	-	-	-	-	-	-	29	36	-	38	38	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1588	-	-	1588	-	-	931	820	1042	932	829	1053
Stage 1	-	-	-	-	-	-	982	867	-	994	876	-
Stage 2	-	-	-	-	-	-	993	869	-	982	867	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1588	-	-	1588	-	-	927	819	1042	931	828	1053
Mov Cap-2 Maneuver	-	-	-	-	-	-	927	819	-	931	828	-
Stage 1	-	-	-	-	-	-	981	866	-	993	876	-
Stage 2	-	-	-	-	-	-	990	869	-	981	866	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0	0	9.1
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1588	-	-	1588	-	-	937
HCM Lane V/C Ratio	-	0.001	-	-	-	-	-	0.061
HCM Control Delay (s)	0	7.3	0	-	0	-	-	9.1
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	24	1027	7	0	611
Future Vol, veh/h	0	24	1027	7	0	611
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	4
Mvmt Flow	0	24	1027	7	0	611

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	517	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	509	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	509	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	509	-
HCM Lane V/C Ratio	-	-	0.047	-
HCM Control Delay (s)	-	-	12.4	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	27	1091	43	0	506
Future Vol, veh/h	0	27	1091	43	0	506
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	4
Mvmt Flow	0	27	1091	43	0	506

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	567	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	472	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	472	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	472	-
HCM Lane V/C Ratio	-	-	0.057	-
HCM Control Delay (s)	-	-	13.1	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.2	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	352	16	59	368	7	20
Future Vol, veh/h	352	16	59	368	7	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	15	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	371	17	62	387	7	21

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	388	0	698	194
Stage 1	-	-	-	-	380	-
Stage 2	-	-	-	-	318	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1182	-	379	821
Stage 1	-	-	-	-	667	-
Stage 2	-	-	-	-	716	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1182	-	359	821
Mov Cap-2 Maneuver	-	-	-	-	359	-
Stage 1	-	-	-	-	667	-
Stage 2	-	-	-	-	679	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	11.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	616	-	-	1182	-
HCM Lane V/C Ratio	0.046	-	-	0.053	-
HCM Control Delay (s)	11.1	-	-	8.2	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	39	297	36	99	362	138	18	0	60	87	0	48
Future Vol, veh/h	39	297	36	99	362	138	18	0	60	87	0	48
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	15	-	-	15	-	15	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	39	297	36	99	362	138	18	0	60	87	0	48

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	500	0	0	333	0	0	772	1091	167	787	971	181
Stage 1	-	-	-	-	-	-	393	393	-	560	560	-
Stage 2	-	-	-	-	-	-	379	698	-	227	411	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1075	-	-	1238	-	-	293	217	854	286	255	837
Stage 1	-	-	-	-	-	-	609	609	-	485	514	-
Stage 2	-	-	-	-	-	-	620	445	-	761	598	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1075	-	-	1238	-	-	252	192	854	243	226	837
Mov Cap-2 Maneuver	-	-	-	-	-	-	252	192	-	243	226	-
Stage 1	-	-	-	-	-	-	587	587	-	468	473	-
Stage 2	-	-	-	-	-	-	538	409	-	682	576	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	1.3	12.6	23.7
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	551	1075	-	-	1238	-	-	325
HCM Lane V/C Ratio	0.142	0.036	-	-	0.08	-	-	0.415
HCM Control Delay (s)	12.6	8.5	-	-	8.2	-	-	23.7
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.5	0.1	-	-	0.3	-	-	2

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	24	0	0	60	56	0	0	0	34	0	9
Future Vol, veh/h	1	24	0	0	60	56	0	0	0	34	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	1	24	0	0	60	56	0	0	0	34	0	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	116	0	0	24	0	0	119	142	24	114	114	88
Stage 1	-	-	-	-	-	-	26	26	-	88	88	-
Stage 2	-	-	-	-	-	-	93	116	-	26	26	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1485	-	-	1604	-	-	861	753	1058	868	780	976
Stage 1	-	-	-	-	-	-	997	878	-	925	826	-
Stage 2	-	-	-	-	-	-	919	803	-	997	878	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1485	-	-	1604	-	-	852	752	1058	867	779	976
Mov Cap-2 Maneuver	-	-	-	-	-	-	852	752	-	867	779	-
Stage 1	-	-	-	-	-	-	996	877	-	924	826	-
Stage 2	-	-	-	-	-	-	911	803	-	996	877	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0	0	9.3
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1485	-	-	1604	-	-	888
HCM Lane V/C Ratio	-	0.001	-	-	-	-	-	0.048
HCM Control Delay (s)	0	7.4	0	-	0	-	-	9.3
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	36	579	2	0	960
Future Vol, veh/h	0	36	579	2	0	960
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	6	0	0	2
Mvmt Flow	0	36	579	2	0	960

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	291	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	712	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	712	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	712	-
HCM Lane V/C Ratio	-	-	0.051	-
HCM Control Delay (s)	-	-	10.3	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.2	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	40	308	14	0	982
Future Vol, veh/h	0	40	308	14	0	982
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	6	0	0	2
Mvmt Flow	0	40	308	14	0	982

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	161	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	862	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	862	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	862	-
HCM Lane V/C Ratio	-	-	0.046	-
HCM Control Delay (s)	-	-	9.4	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	363	5	19	228	11	30
Future Vol, veh/h	363	5	19	228	11	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	15	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	382	5	20	240	12	32

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	387	0	545	194
Stage 1	-	-	-	-	385	-
Stage 2	-	-	-	-	160	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1183	-	473	821
Stage 1	-	-	-	-	663	-
Stage 2	-	-	-	-	858	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1183	-	465	821
Mov Cap-2 Maneuver	-	-	-	-	465	-
Stage 1	-	-	-	-	663	-
Stage 2	-	-	-	-	843	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	681	-	-	1183	-
HCM Lane V/C Ratio	0.063	-	-	0.017	-
HCM Control Delay (s)	10.6	-	-	8.1	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	351	17	31	161	44	45	0	97	130	0	42
Future Vol, veh/h	25	351	17	31	161	44	45	0	97	130	0	42
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	15	-	-	15	-	15	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	25	351	17	31	161	44	45	0	97	130	0	42

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	205	0	0	368	0	0	553	677	184	449	641	81
Stage 1	-	-	-	-	-	-	410	410	-	223	223	-
Stage 2	-	-	-	-	-	-	143	267	-	226	418	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1378	-	-	1202	-	-	420	377	833	498	395	969
Stage 1	-	-	-	-	-	-	595	599	-	765	723	-
Stage 2	-	-	-	-	-	-	851	692	-	762	594	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1378	-	-	1202	-	-	389	360	833	425	378	969
Mov Cap-2 Maneuver	-	-	-	-	-	-	389	360	-	425	378	-
Stage 1	-	-	-	-	-	-	584	588	-	751	704	-
Stage 2	-	-	-	-	-	-	793	674	-	661	583	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	1.1	12.7	16.2
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	612	1378	-	-	1202	-	-	493
HCM Lane V/C Ratio	0.232	0.018	-	-	0.026	-	-	0.349
HCM Control Delay (s)	12.7	7.7	-	-	8.1	-	-	16.2
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.9	0.1	-	-	0.1	-	-	1.5

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	46	0	27	22	17	0	19	86	54	6	3
Future Vol, veh/h	2	46	0	27	22	17	0	19	86	54	6	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	46	0	27	22	17	0	19	86	54	6	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	39	0	0	46	0	0	139	143	46	188	135	31
Stage 1	-	-	-	-	-	-	50	50	-	85	85	-
Stage 2	-	-	-	-	-	-	89	93	-	103	50	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1584	-	-	1575	-	-	836	752	1029	777	760	1049
Stage 1	-	-	-	-	-	-	968	857	-	928	828	-
Stage 2	-	-	-	-	-	-	923	822	-	908	857	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1584	-	-	1575	-	-	817	738	1029	688	746	1049
Mov Cap-2 Maneuver	-	-	-	-	-	-	817	738	-	688	746	-
Stage 1	-	-	-	-	-	-	967	856	-	927	813	-
Stage 2	-	-	-	-	-	-	897	807	-	813	856	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	3	9.2	10.6
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	960	1584	-	-	1575	-	-	705
HCM Lane V/C Ratio	0.109	0.001	-	-	0.017	-	-	0.089
HCM Control Delay (s)	9.2	7.3	0	-	7.3	0	-	10.6
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0.1	-	-	0.3

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	24	1029	7	0	614
Future Vol, veh/h	0	24	1029	7	0	614
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	4
Mvmt Flow	0	24	1029	7	0	614

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	518	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	508	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	508	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	508	-
HCM Lane V/C Ratio	-	-	0.047	-
HCM Control Delay (s)	-	-	12.4	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	27	1093	43	0	509
Future Vol, veh/h	0	27	1093	43	0	509
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	4
Mvmt Flow	0	27	1093	43	0	509

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	568	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	471	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	471	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	471	-
HCM Lane V/C Ratio	-	-	0.057	-
HCM Control Delay (s)	-	-	13.1	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.2	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	369	15	59	378	7	20
Future Vol, veh/h	369	15	59	378	7	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	15	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	388	16	62	398	7	21

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	404	0	719	202
Stage 1	-	-	-	-	396	-
Stage 2	-	-	-	-	323	-
Critical Hdwy	-	-	4.1	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1166	-	368	811
Stage 1	-	-	-	-	655	-
Stage 2	-	-	-	-	712	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1166	-	348	811
Mov Cap-2 Maneuver	-	-	-	-	348	-
Stage 1	-	-	-	-	655	-
Stage 2	-	-	-	-	674	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	603	-	-	1166	-
HCM Lane V/C Ratio	0.047	-	-	0.053	-
HCM Control Delay (s)	11.3	-	-	8.3	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	39	297	52	101	362	138	28	0	61	87	0	48
Future Vol, veh/h	39	297	52	101	362	138	28	0	61	87	0	48
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	15	-	-	15	-	15	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	39	297	52	101	362	138	28	0	61	87	0	48

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	500	0	0	349	0	0	784	1103	175	791	991	181
Stage 1	-	-	-	-	-	-	401	401	-	564	564	-
Stage 2	-	-	-	-	-	-	383	702	-	227	427	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1075	-	-	1221	-	-	287	213	844	284	248	837
Stage 1	-	-	-	-	-	-	602	604	-	483	512	-
Stage 2	-	-	-	-	-	-	617	443	-	761	589	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1075	-	-	1221	-	-	247	188	844	240	219	837
Mov Cap-2 Maneuver	-	-	-	-	-	-	247	188	-	240	219	-
Stage 1	-	-	-	-	-	-	580	582	-	466	470	-
Stage 2	-	-	-	-	-	-	534	406	-	680	568	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	1.4	14.2	24
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	479	1075	-	-	1221	-	-	322
HCM Lane V/C Ratio	0.186	0.036	-	-	0.083	-	-	0.419
HCM Control Delay (s)	14.2	8.5	-	-	8.2	-	-	24
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.7	0.1	-	-	0.3	-	-	2

Intersection	
Int Delay, s/veh	5.2

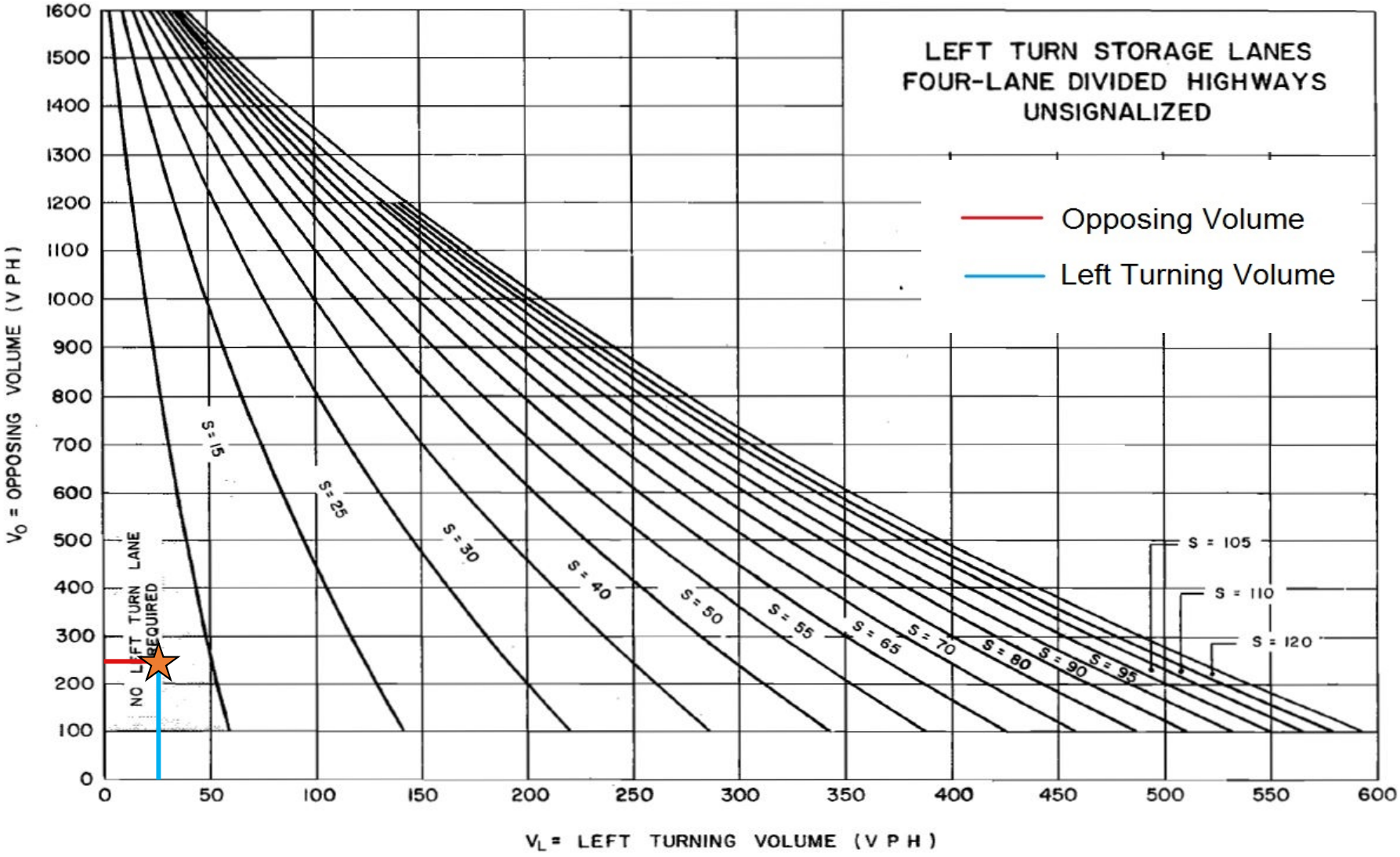
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	30	0	83	70	56	0	11	52	34	18	10
Future Vol, veh/h	1	30	0	83	70	56	0	11	52	34	18	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	1	30	0	83	70	56	0	11	52	34	18	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	126	0	0	30	0	0	310	324	30	328	296	98
Stage 1	-	-	-	-	-	-	32	32	-	264	264	-
Stage 2	-	-	-	-	-	-	278	292	-	64	32	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1473	-	-	1596	-	-	646	597	1050	629	619	963
Stage 1	-	-	-	-	-	-	990	872	-	746	694	-
Stage 2	-	-	-	-	-	-	733	675	-	952	872	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1473	-	-	1596	-	-	597	563	1050	564	584	963
Mov Cap-2 Maneuver	-	-	-	-	-	-	597	563	-	564	584	-
Stage 1	-	-	-	-	-	-	989	871	-	745	655	-
Stage 2	-	-	-	-	-	-	666	637	-	893	871	-

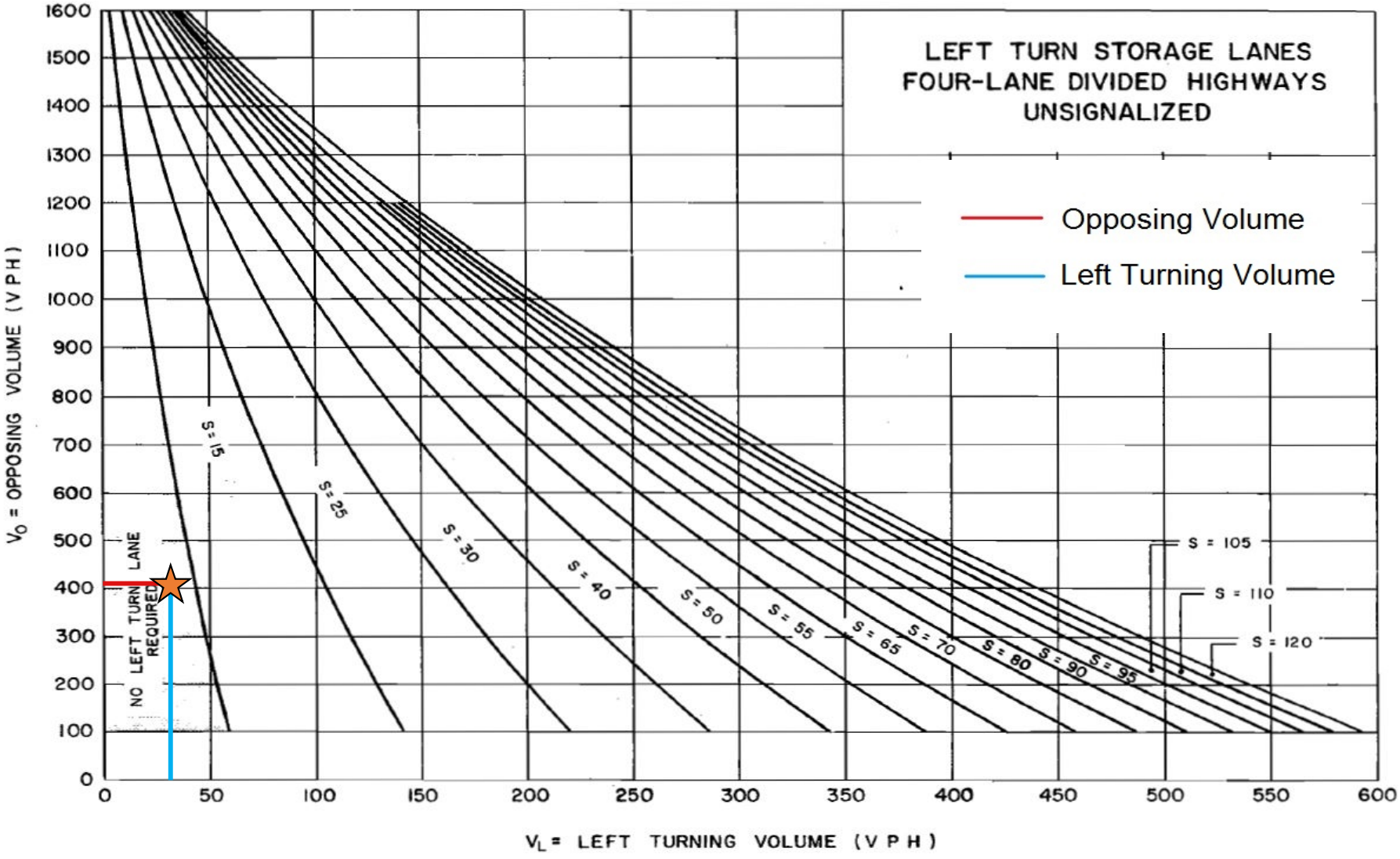
Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	2.9	9.2	11.6
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	912	1473	-	-	1596	-	-	611
HCM Lane V/C Ratio	0.069	0.001	-	-	0.052	-	-	0.101
HCM Control Delay (s)	9.2	7.4	0	-	7.4	0	-	11.6
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0.2	-	-	0.3

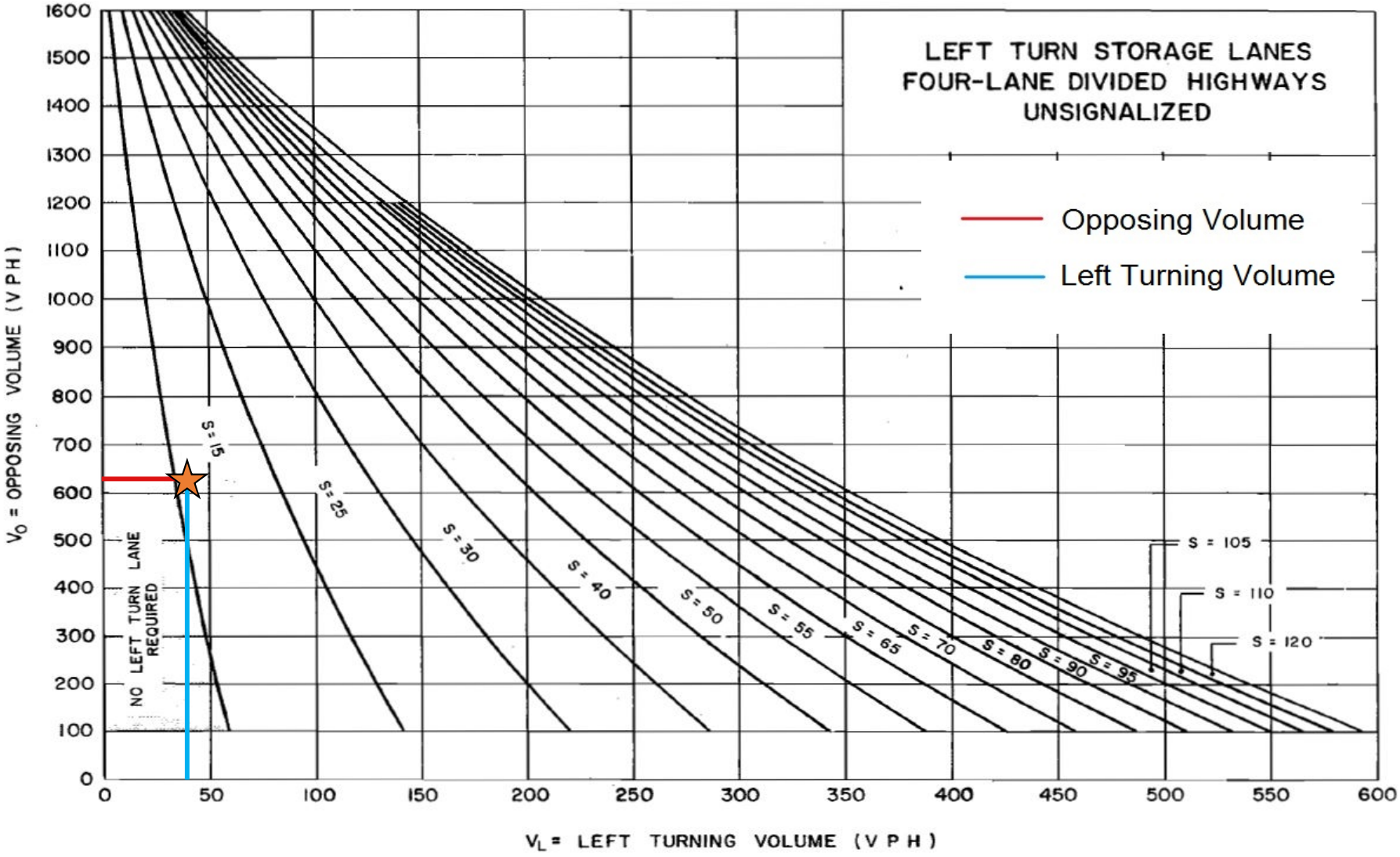
Appendix B – Left-Turn Lane Warrant Analysis



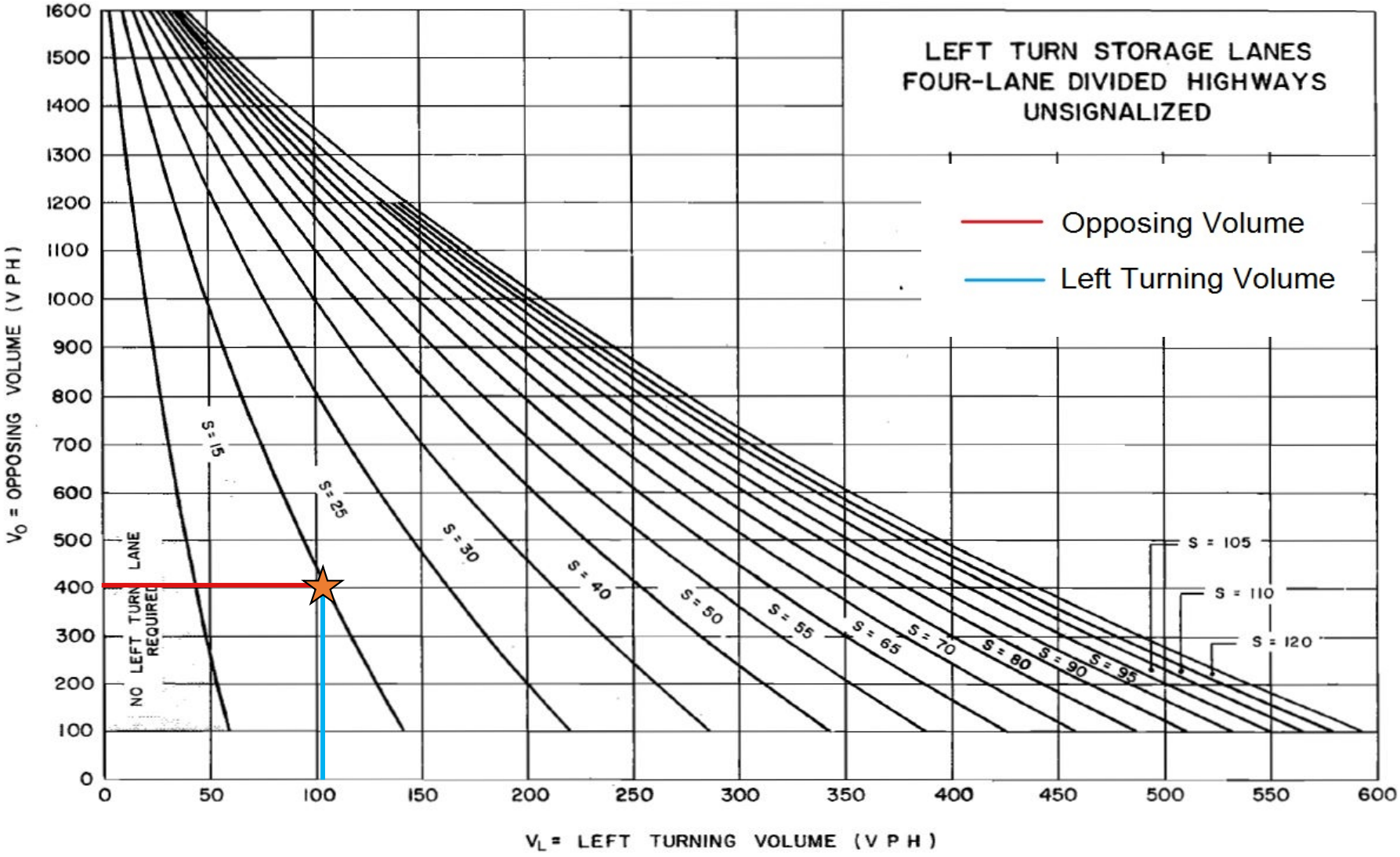
Bradley Ave & Yorkville St | Eastbound Left-Turn | AM Peak Hour



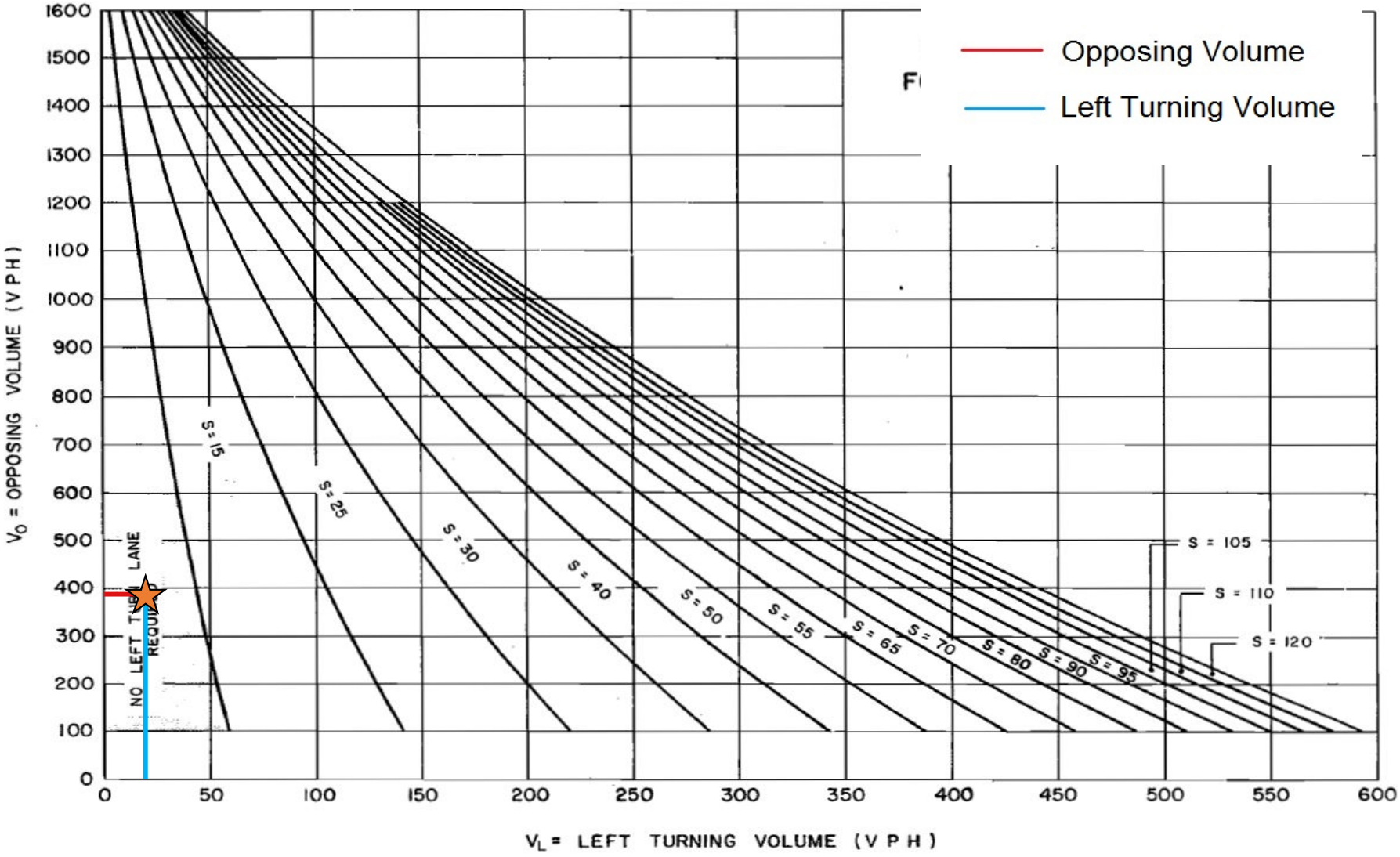
Bradley Ave & Yorkville St | Westbound Left-Turn | AM Peak Hour



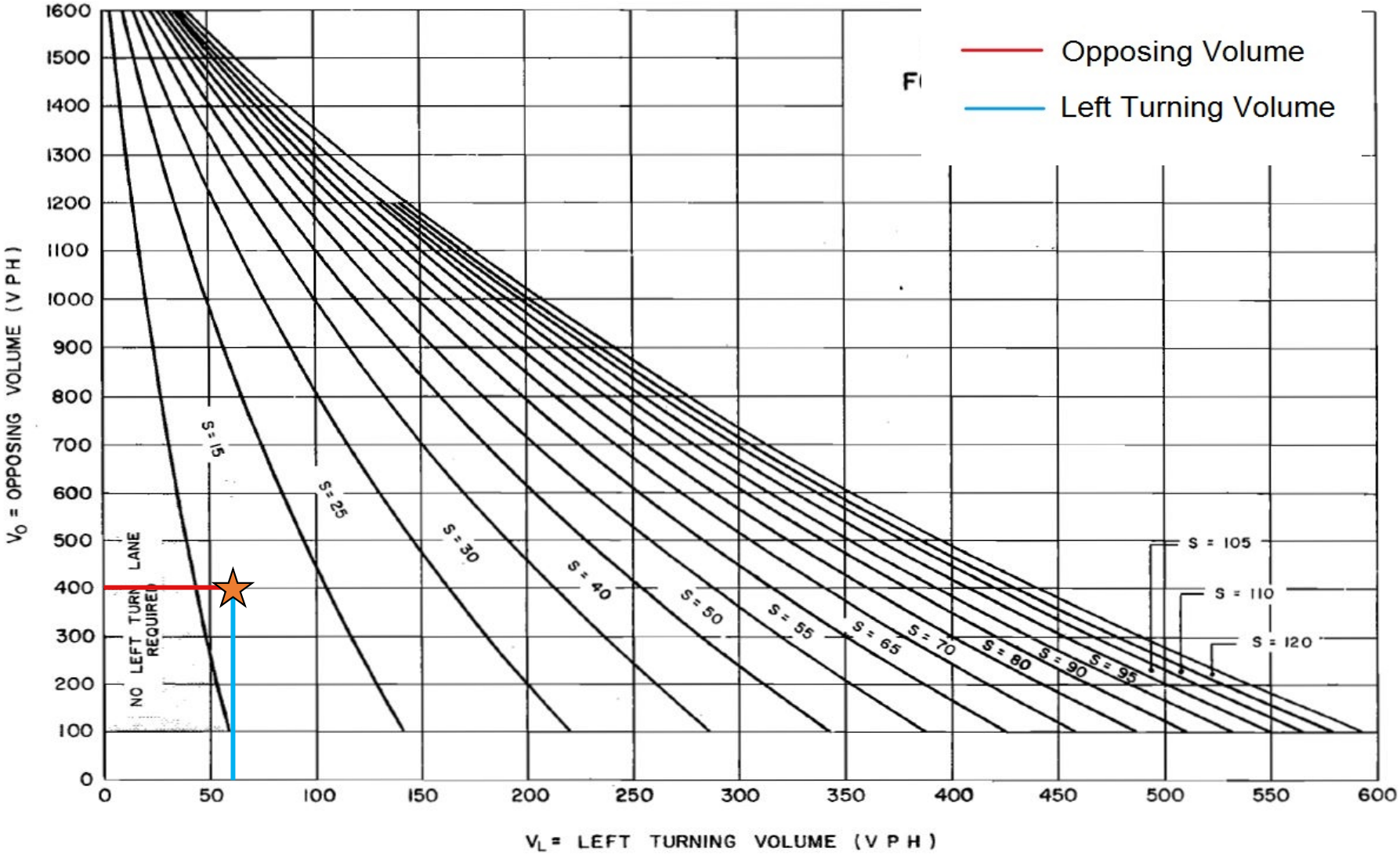
Bradley Ave & Yorkville St | Eastbound Left-Turn | PM Peak Hour



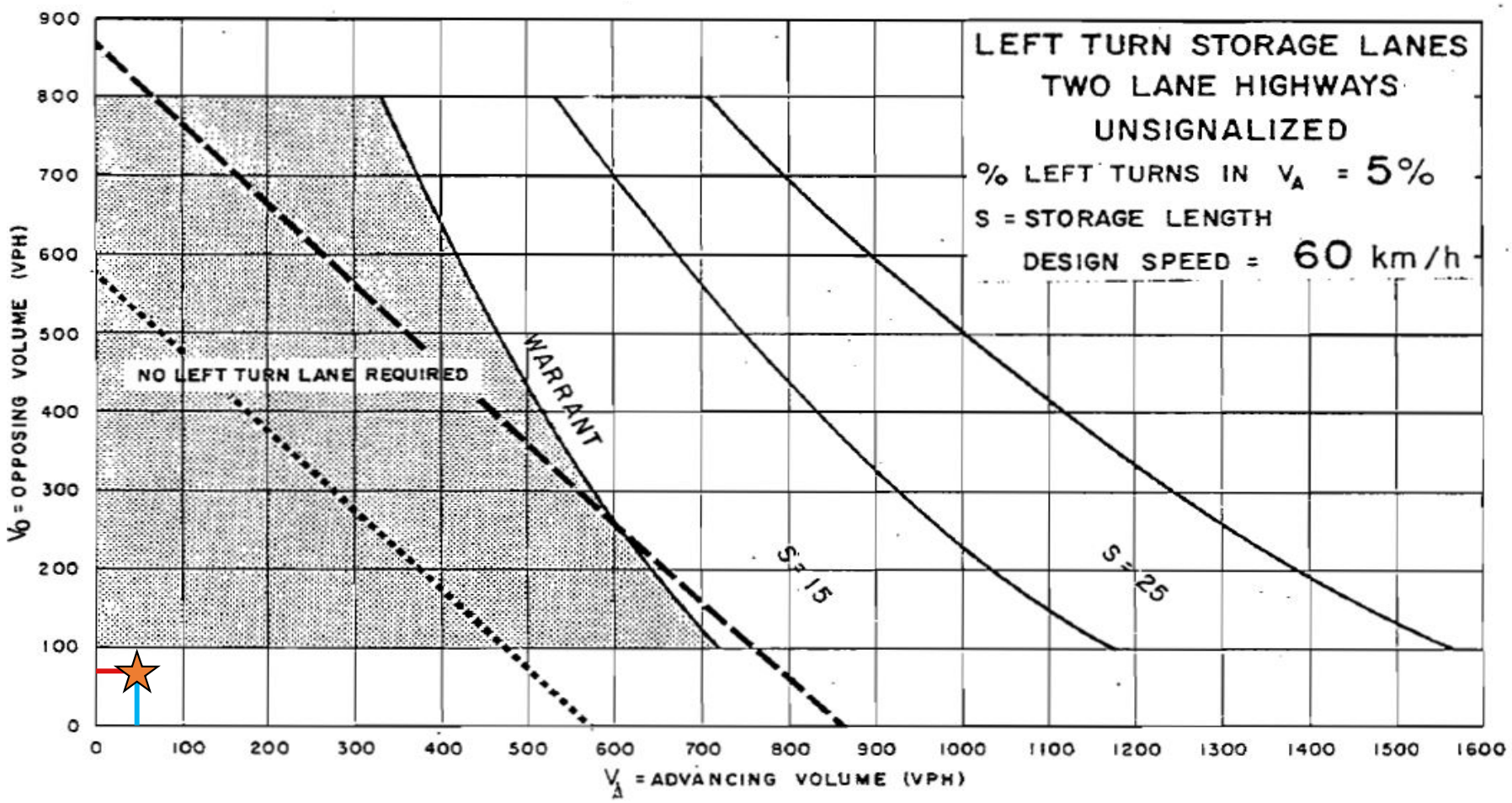
Bradley Ave & Yorkville St | Westbound Left-Turn | PM Peak Hour



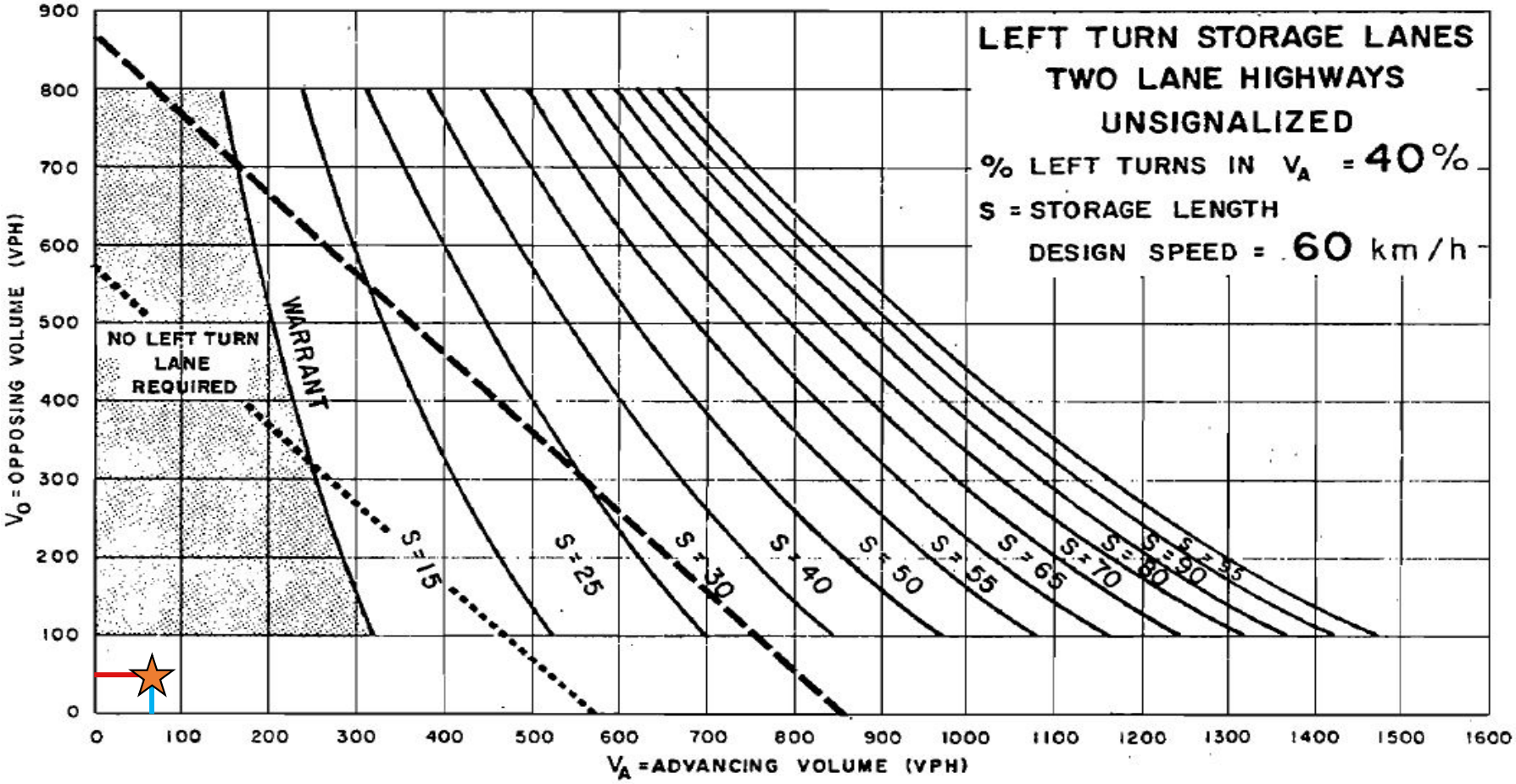
Bradley Ave & Street 'I' | Westbound Left-Turn | AM Peak Hour



Bradley Ave & Street 'I' | Westbound Left-Turn | PM Peak Hour



Kilbourne Rd & Yorkville St | Eastbound Left-Turn | AM Peak Hour



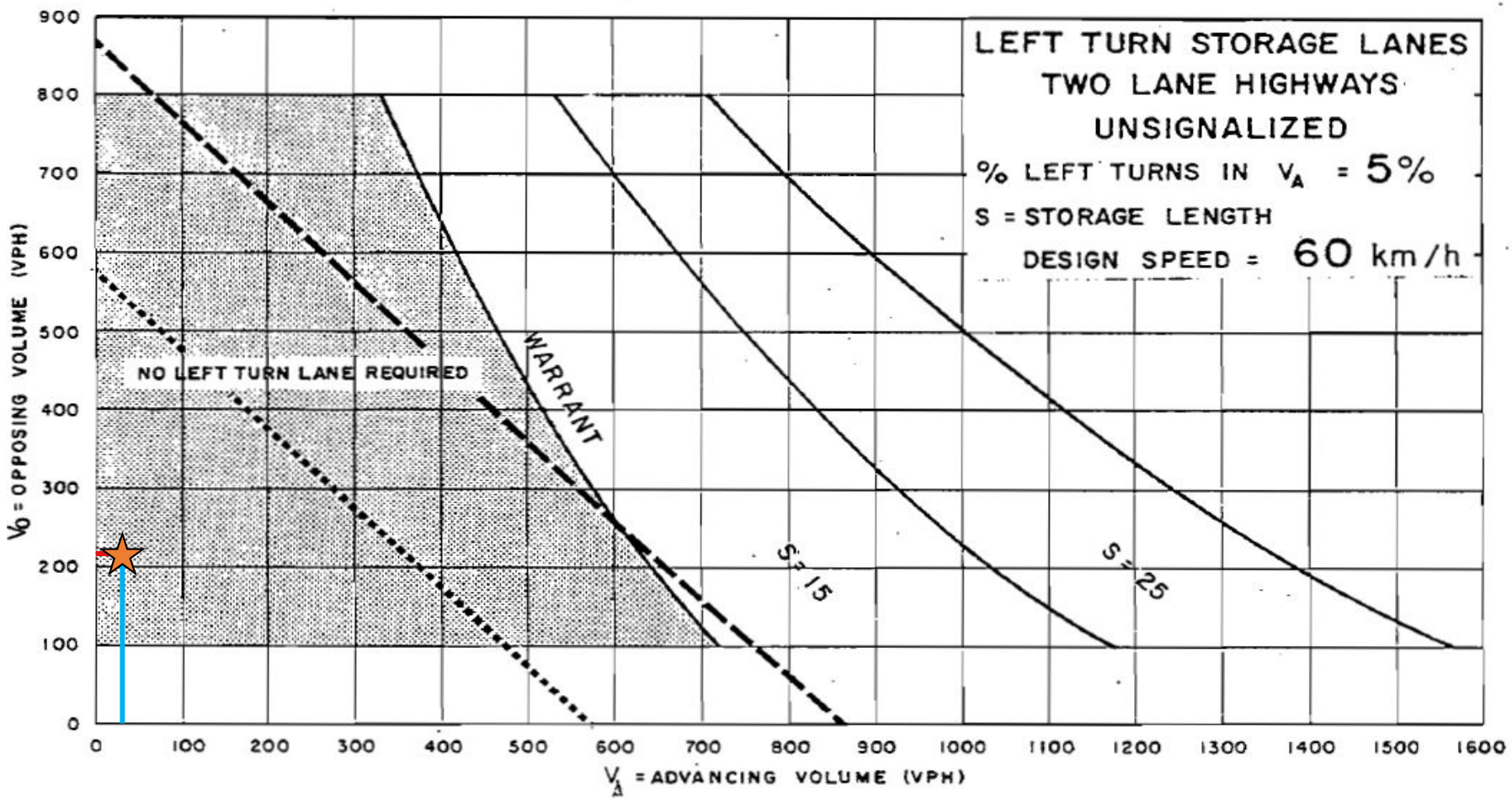
TRAFFIC SIGNALS MAY BE WARRANTED IN RURAL AREAS OR URBAN AREAS WITH RESTRICTED FLOW

TRAFFIC SIGNALS MAY BE WARRANTED IN "FREE FLOW" URBAN AREAS

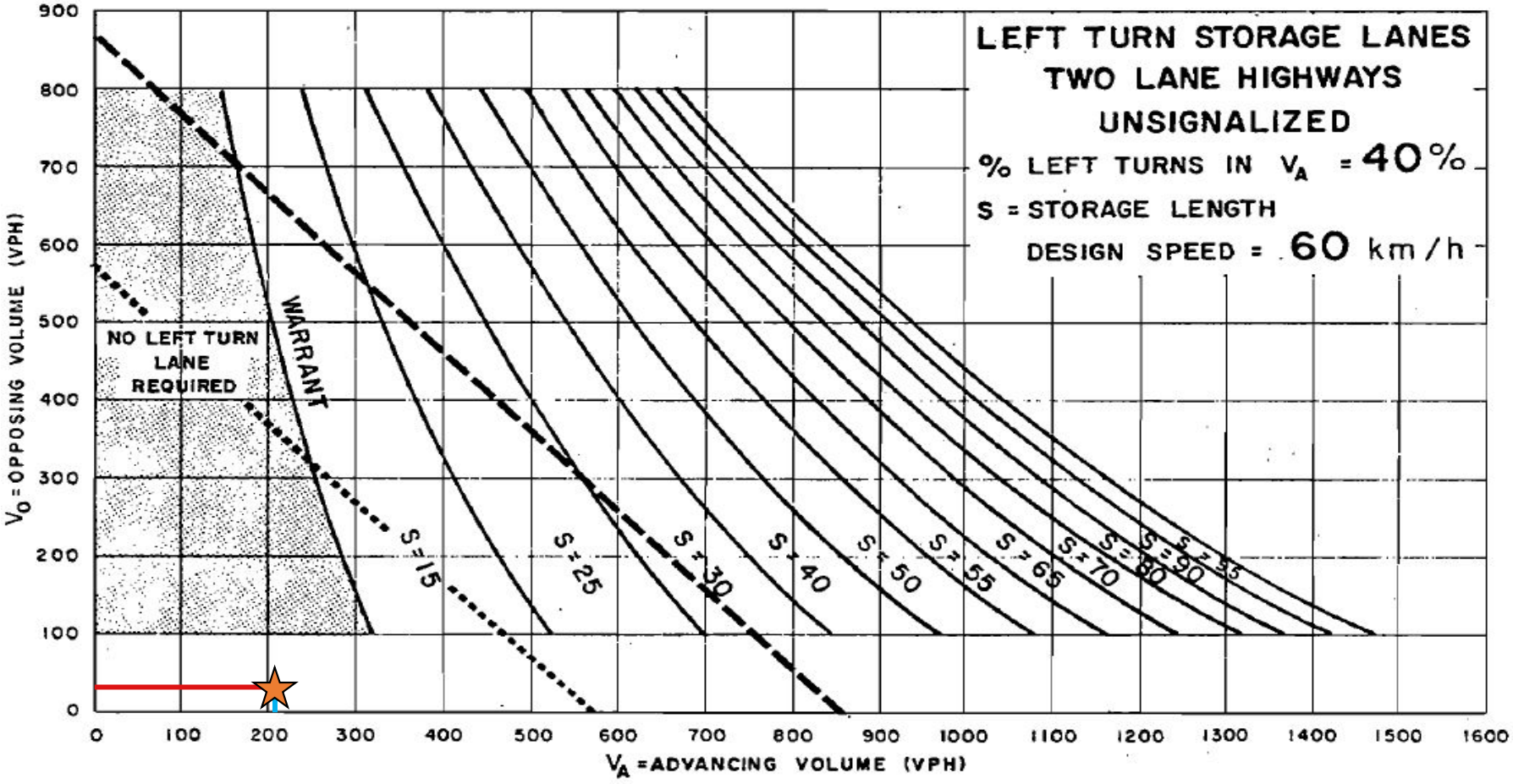
Opposing Volume

Advancing Volume

Kilbourne Rd & Yorkville St | Westbound Left-Turn | AM Peak Hour



Kilbourne Rd & Yorkville St | Eastbound Left-Turn | PM Peak Hour



TRAFFIC SIGNALS MAY BE WARRANTED IN RURAL AREAS OR URBAN AREAS WITH RESTRICTED FLOW

TRAFFIC SIGNALS MAY BE WARRANTED IN "FREE FLOW" URBAN AREAS

Opposing Volume

Advancing Volume

Kilbourne Rd & Yorkville St | Westbound Left-Turn | PM Peak Hour

Appendix C – PXO Decision Support Tool and Selection Matrix

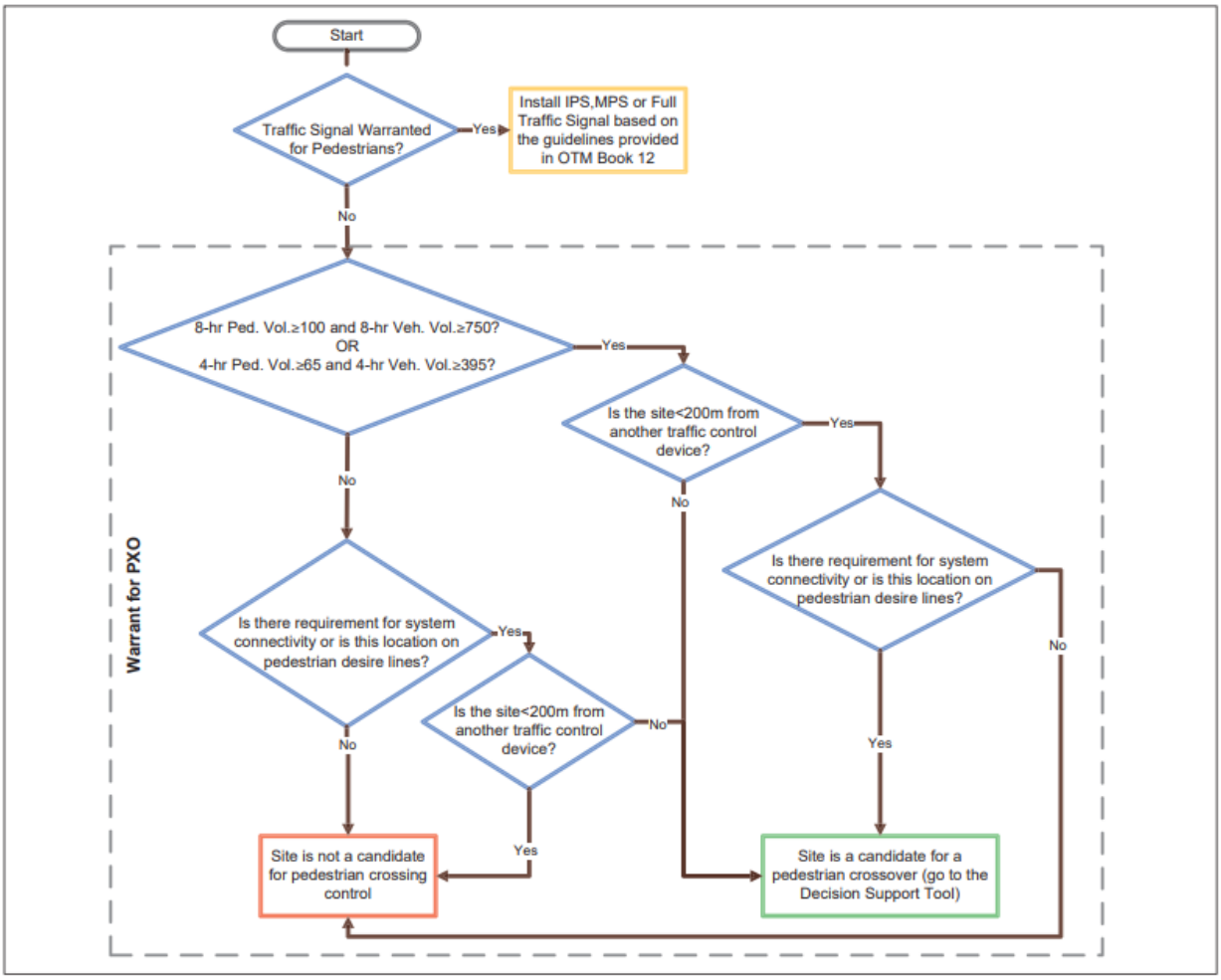


Figure 2: Decision Support Tool – Preliminary Assessment

Table 7: Pedestrian Crossover Selection Matrix

Two-way Vehicular Volume			Posted Speed Limit (km/h	Total Number of Lanes for the Roadway Cross Section[1]			
Time Period	Lower Bound	Upper Bound		1 or 2 Lanes	3 lanes	4 lanes w/raised refuge	4 lanes w/o raised refuge
8 Hour	750	2,250	≤50	Level 2 Type D	Level 2 Type C[3]	Level 2 Type D[2]	Level 2 Type B
4 Hour	395	1,185					
8 Hour	750	2,250	60	Level 2 Type C	Level 2 Type B	Level 2 Type C[2]	Level 2 Type B
4 Hour	395	1,185					
8 Hour	2,250	4,500	≤50	Level 2 Type D	Level 2 Type B	Level 2 Type D[2]	Level 2 Type B
4 Hour	1,185	2,370					
8 Hour	2,250	4,500	60	Level 2 Type C	Level 2 Type B	Level 2 Type C[2]	Level 2 Type B
4 Hour	1,185	2,370					
8 Hour	4,500	6,000	≤50	Level 2 Type C	Level 2 Type B	Level 2 Type C[2]	Level 2 Type B
4 Hour	2,370	3,155					
8 Hour	4,500	6,000	60	Level 2 Type B	Level 2 Type B	Level 2 Type C[2]	Level 2 Type B
4 Hour	2,370	3,155					
8 Hour	6,000	7,500	≤50	Level 2 Type B	Level 2 Type B	Level 2 Type C[2]	Level 1 Type A
4 Hour	3,155	3,950					
8 Hour	6,000	7,500	60	Level 2 Type B	Level 2 Type B		
4 Hour	3,155	3,950					
8 Hour	7,500	17,500	≤50	Level 2 Type B	Level 2 Type B		
4 Hour	3,950	9,215					
8 Hour	7,500	17,500	60	Level 2 Type B			
4 Hour	3,950	9,215					

Type A Type B Type C Type D

Approaches to roundabouts should be considered a separate roadways.

[1]The total number of lanes is representative of crossing distance. The width of these lanes is assumed to be between 3.0 m and 3.75 m according to MTO Geometric Design Standards for Ontario Highways (Chapter D.2). A cross sectional feature (e.g. bike lane or on-street parking) may extend the average crossing distance beyond this range of lane widths.

[2]Use of two sets of side mounted signs for each direction (one on the right side and one on the median)

[3] Use Level 2 Type B PXO up to 3 lanes total, cross section one-way.

The hatched cells in this table show that a PXO is not recommended for sites with these traffic and geometric conditions. Generally a traffic signal is warranted for such conditions.