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Transportation Impact Assessment – Final Report

115 Lusk Street

IBI

Prepared for DCR Phoenix
by IBI Group
January 12, 2021

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Transmittal

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Delivery	E-mail/Electronic Submission
From	David Hook, P.Eng.
Sent By	David Hook
Date	January 12, 2021
Project No	122508
Subject	115 Lusk Street TIA - Final Report

Please find enclosed the TIA Final Report in support of a Site Plan Control application relating to the proposed restaurant and medical office development at 115 Lusk Street on behalf of DCR Phoenix.

The TIA report has been updated in response to the Circulation Comments received from the City dated October 14, 2020. Key changes to the report since the Step 4 submission are summarized as follows:

- The site plan was refined to indicate that both proposed site access driveways will follow City Standard SC7.1, to show details of the roads abutting the site up to the opposite curbs and to more clearly illustrate enhanced accessibility features including curb depressions, tactile walking surface indicators (TWSIs) and wider sidewalk connections between barrier-free parking spaces and primary building entrances;
- Existing (2019) traffic volumes shown in Figure 3 have been corrected;
- Supplemental segment-based MMLOS analysis was conducted, based on the Roadway Modification Application (RMA-2019-TPD-041B) for Fallowfield Road adjacent to the site. This analysis is included in Appendix H;
- Additional intersection capacity analyses have been undertaken to illustrate future operating conditions at the Fallowfield/ O'Keefe intersection, should it remain as a two-way stop-controlled intersection and is included in Appendix J;
- Vehicular swept-path analyses have been undertaken for delivery and waste collection vehicles and are included in Section 5.1.2;

All comments and responses associated with this study have been documented and provided in Appendix A. Attached are the Synchro analysis files associated with this report.

If you require anything else, please don't hesitate to contact me at 613-225-1311 x64029 or by email at dhook@ibigroup.com.

Best Regards,

David Hook, P.Eng.

TIA Plan Reports - Certification

On 14 June 2017, the Council of the City of Ottawa adopted new Transportation Impact Assessment (TIA) Guidelines. In adopting the guidelines, Council established a requirement for those preparing and delivering transportation impact assessments and reports to sign a letter of certification.

Individuals submitting TIA reports will be responsible for all aspects of development-related transportation assessment and reporting, and undertaking such work, in accordance and compliance with the City of Ottawa's Official Plan, the Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines.

By submitting the attached TIA report (and any associate documents) and signing this document, the individual acknowledges that s/he meets the four criteria listed below:

CERTIFICATION

1. I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;

2. I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;

3. I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and

4. I am either a licensed[1] or registered[1] professional in good standing, whose field of expertise [check √ appropriate field(s)] is either transportation engineering □ or transportation planning □.

[1] **License or registration body that oversees the profession is required to have a code of conduct and ethics guidelines that will ensure appropriate conduct and representation for transportation planning and/or transportation engineering works.**

Dated at Ottawa this 12th day of January, 2021.
(City)

Name: David Hook, P.Eng.

Professional Title: Project Engineer

Signature of Individual certifier that she/he meets the above four criteria

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Stamp

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Executive Summary

IBI Group (IBI) was retained by DCR Phoenix to undertake a Transportation Impact Assessment (TIA) in support of a Site Plan Control application for an approximate 280 square metre proposed restaurant and 560 square metre medical office development to be located at 115 Lusk Street, Ottawa. The development represents a parcel of land in the original 4401 Fallowfield Road Plan of Subdivision.

The site is expected to be fully built out in a single phase and occupied by 2023. The horizon year of the study was therefore taken as 2028, representing 5 years beyond the expected full build-out of the site. The site will be accessed via two full-movement private approaches with direct connections to Forager Street and Lusk Street. Both of these are local streets within the 4401 Fallowfield Road subdivision and provide access to O'Keefe Court and Fallowfield Road, respectively. A total of 55 vehicle parking spaces and 8 bicycle parking spaces will be provided.

Based on the traffic analysis results, the proposed development is expected to generate up to 13 and 32 two-way vehicular trips during the weekday morning and afternoon peak hours, respectively. These traffic volumes were distributed amongst two site access driveways, representing a marginal increase in traffic volumes with respect to the overall traffic projections expected within the 2028 study horizon year. The mode share targets were based on the South Nepean Traffic Assessment Zone (TAZ) and proportionally adjusted, in accordance with the Conditions of Approval for 4401 Fallowfield Road to yield an 85% auto/ 15% non-auto mode share split. It should also be noted that this study did not apply any pass-by reductions factors to the restaurant's trip generation, as it was determined that the overall impact on the adjacent road network would be minimal.

The intersection of Fallowfield & O'Keefe/ Cobble Hill is presently operating as a two-way stop controlled intersection. The results of the analysis indicate that, by 2023, traffic signals will be operationally required under background traffic conditions, however signals are not warranted within the timeframe of this study. With traffic signals in place, the intersection would be expected to operate at an acceptable level of service (LOS 'B') beyond the study horizon year. If traffic signals are not implemented by the 2028 study horizon year, the results of the analysis indicate that long delays of approximately 4 to 5 minutes are expected at the Fallowfield & O'Keefe intersection with or without the inclusion of site-generated traffic. As site-generated traffic will not contribute significantly to any potential traffic operational issues at this intersection, it is recommended that the City continue monitoring this intersection on an annual basis to determine the appropriate timing for the introduction of traffic signals.

The results of the analysis indicate that the intersections of O'Keefe Court & Lusk Street and Fallowfield Road & Forager Street are expected to operate within acceptable standards (LOS 'D' or better) during the weekday morning and afternoon peak hours. Both are T-intersections that are configured with stop control on the minor road and do not warrant auxiliary lanes or future modifications to intersection control within the timeframe of this study.

A multi-modal analysis identifies deficiencies in the existing road network and potential remediation measures have been suggested in which the City could consider to meet these prescribed targets. It should be noted that, although these measures would improve for a range of transportation modes, they are not required to safely accommodate the transportation demands of the proposed development.

A Roadway Modification Application (RMA-2019-TPD-041B) was recently approved to satisfy a conditional requirement for the 4401 Fallowfield Road Subdivision. The RMA includes the right-in/right-out intersection at Fallowfield Road & Forager Street and a multi-use pathway along the west side of Fallowfield Road. As there is already an approved RMA intended to address the implementation of the above noted design elements and no off-site geometric improvements are required as a direct result of the proposed development, an RMA will not be included with the submission of this Transportation Impact Assessment.

All study area intersections were shown to operate well within the capacity constraints of the adjacent transportation network, with the appropriate modifications in place (i.e. signalization of Fallowfield & O'Keefe/ Cobble Hill by 2023). Further, the proposed development will contribute a negligible volume of traffic to the adjacent road network. A post-development Monitoring Plan is, therefore, not a requirement of this study.

Based on the findings of this study, it is the overall opinion of IBI Group that the proposed development will integrate well with and can be safely accommodated by the adjacent transportation network with the recommended actions and modifications in place.

1 Introduction

IBI Group (IBI) was retained by DCR Phoenix to undertake a Transportation Impact Assessment (TIA) in support of a Site Plan Control application for a proposed restaurant and medical office development to be located at 115 Lusk Street, Ottawa. The development represents a parcel of land in the original 4401 Fallowfield Road Plan of Subdivision.

In accordance with the City of Ottawa's Transportation Impact Assessment Guidelines, published in June 2017, the following report is divided into four major components:

- **Screening** – Prior to the commencement of a TIA, an initial assessment of the proposed development is undertaken to establish the need for a comprehensive review of the site based on three triggers: Trip Generation, Location and Safety.
- **Scoping** – This component of the TIA report describes both the existing and planned conditions in the vicinity of the development and defines study parameters such as the study area, analysis periods and analysis years of the development. It also provides an opportunity to identify any scope exemptions that would eliminate elements of scope described in the TIA Guidelines but not relevant to the development proposal, based on consultation with City staff.
- **Forecasting** – The Forecasting component of the TIA is intended to review both the development-generated travel demand and the background network travel demand. It also provides an opportunity to rationalize this demand to ensure projections are within the capacity constraints of the transportation network.
- **Analysis** – This component documents the results of any analyses undertaken to ensure that the transportation related features of the proposed development are in conformance with prescribed technical standards and that its impacts on the transportation network are both sustainable and effectively managed. It also identifies a development strategy to ensure that what is being proposed is aligned with the City of Ottawa's policies and city-building objectives.

Throughout the development of a TIA report, each of the four study components above are submitted in draft form to the City of Ottawa and undergo a review by a designated Transportation Project Manager. Any comments received are addressed to the satisfaction of the City's Transportation Project Manager before proceeding with subsequent components of the study. All technical comments and responses throughout this process are included in **Appendix A**.

A Roadway Modification Application (RMA-2019-TPD-041B) was recently approved to satisfy a conditional requirement for the Subdivision. The RMA includes a right-in/right-out intersection at Fallowfield Road & Forager Street and a multi-use pathway along the west side of Fallowfield Road. As such, an RMA will not be required as part of this TIA. The submission may require a post-development Monitoring Plan to track performance of the planned TIA Strategy, however the need for a Monitoring Plan will be confirmed through the analysis undertaken in this report.

2 TIA Screening

An initial screening was completed to confirm the need for a Transportation Impact Assessment by reviewing the following three triggers:

- **Trip Generation**: Preliminary trip generation estimates were developed based on the Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition). A 1.28 person-trip conversion factor was applied to the base trip generation data to obtain person-trip generation. The 60 person-trip threshold prescribed by the TIA Guidelines is met during the weekday afternoon peak hour therefore the Trip Generation trigger is satisfied.
- **Location**: The proposed development will not be accessed from a boundary street that is designated as part of the City's Transit Priority, Rapid Transit network or Spine Bicycle Networks nor is the subject site within a Design Priority Area or Transit-Oriented Development zone, therefore, the Location trigger is not satisfied.
- **Safety**: Boundary street conditions were reviewed to determine if there is an elevated potential for safety concerns adjacent the site. Based on this review, there is no elevated potential for safety concerns adjacent to the site, therefore the Safety trigger is not satisfied.

As the proposed development meets the Trip Generation trigger, the need to undertake a Transportation Impact Assessment is confirmed.

A copy of the Screening Form is provided in **Appendix B**.

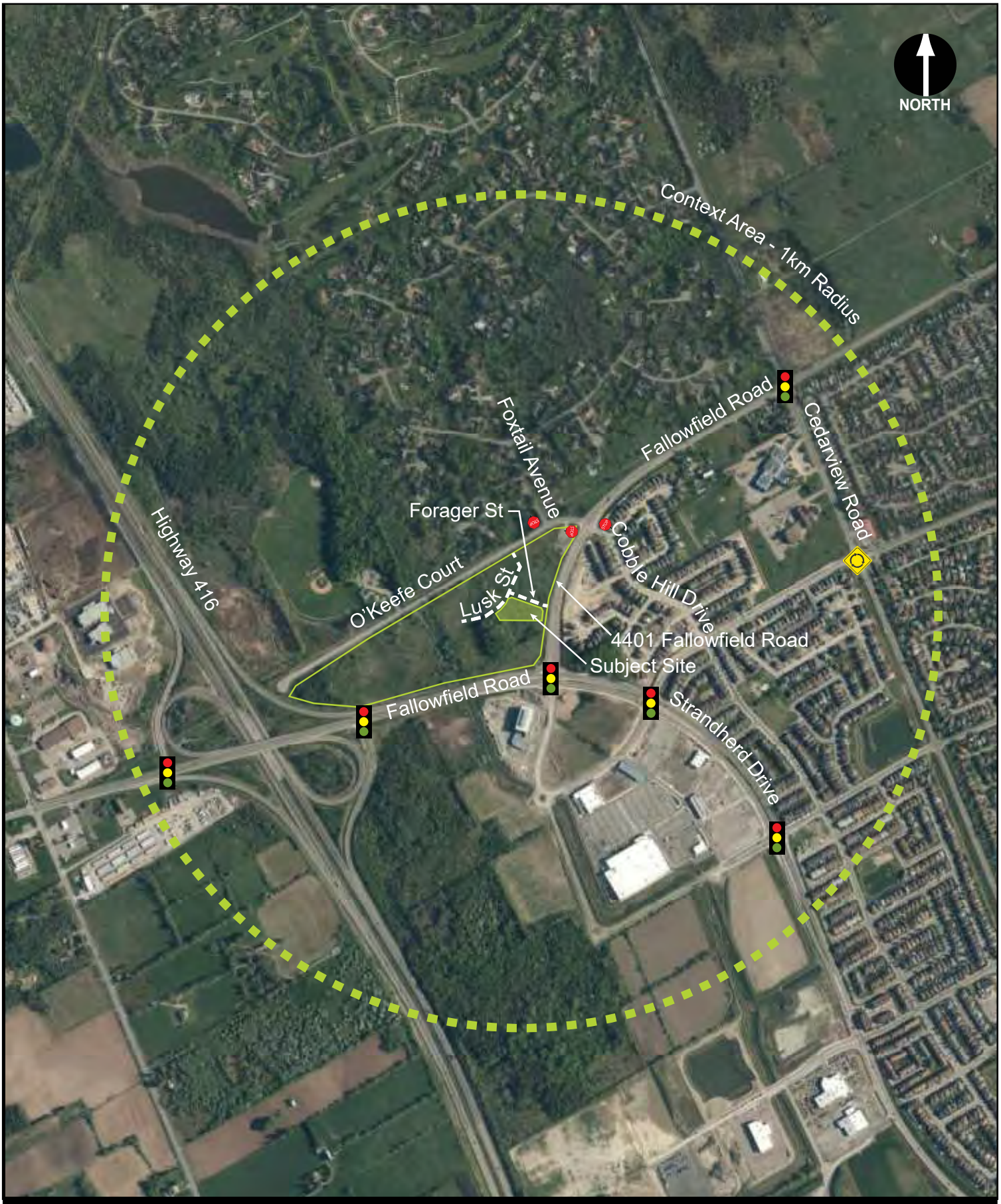
3 Project Scoping

3.1 Description of Proposed Development

3.1.1 Site Location

The proposed development is located within the 4401 Fallowfield Road business park adjacent to Lusk Street, Forager Street and Fallowfield Road. The municipal address of the subject site is 115 Lusk Street. The approximately 0.4 hectare site is currently undeveloped and, based on GeoOttawa, is zoned IP[2265] H(16) – Business Park Industrial Zone.

The site location and its surrounding context is illustrated in **Exhibit 1**.



IBI

115 Lusk Street
Transportation Impact Assessment

Exhibit 1:
Site Location

PROJECT No. 122508
DATE: January 2021
SCALE: 0m 125m 250m

3.1.2 Land Use Details

Table 1 summarizes the proposed land uses included in this development.

Table 1 - Land Use Statistics

LAND USE	SIZE
Quality Restaurant	280 m^2 (3,014 ft^2)
Medical Office	560 m^2 (6,103 ft^2)

The proposed development is illustrated in **Exhibit 2**.

The site will be accessed via two full-movement private approaches with direct connections to Forager Street and Lusk Street. Both of these are local streets within the 4401 Fallowfield Road subdivision and provide access to O'Keefe Court and Fallowfield Road, respectively. A total of 55 vehicle parking spaces and 8 bicycle parking spaces will be provided.

3.1.3 Development Phasing & Date of Occupancy

The proposed development will be constructed in a single phase. It is anticipated that the development will be constructed and fully occupied by 2023.

NORTH

LUSK STREET

FORAGER STREET

FALLOWFIELD

PROPERTY LINE

SETBACK LINE

RELOCATE HYDRANT TO CLEAR ENTRANCE

SAW CUT AND REINSTATE TO MATCH EXISTING ASPHALT STRUCTURE PER CITY STANDAD R-10

DEPRESSED CURB AND SIDEWALK ENTRANCE PER CITY STANDARD SC7.1

R6

6.7 m

MEDICAL OFFICES

BUILDING AREA:560.40M²
GROSS FLOOR AREA 507.70M²

FIRE LANE

PAINTED LINES

SCREENED GARBAGE ENCLOSURE

TOTAL PARKING STALLS PROVIDED: 53

LENGTH OF DEAD END FIRE ROUTE 37.3 M

CENTRELINE RADIUS 12.0 M

SNOW STORAGE AREA

LOADING

ENTRANCE

OUTDOOR PATIO
2.0M HIGH GLASS ENCLOSURE

WALL MOUNTED EXTERIOR LIGHT FIXTURE

FRATELLI RESTAURANT

BUILDING AREA: 280 SM

SCREENED GARBAGE ENCLOSURE

WALL MOUNTED EXTERIOR LIGHT FIXTURE

CICB200C G/G 103.62

G/G 103.61

G/G 102.98

CB200B G/G 102.98

HYD 103.93

CB206A T/G 103.38

INV= 100.22

D.C.

IBI

115 Lusk Street
Transportation Impact Assessment

Exhibit 2: Proposed Development

PROJECT No. 122508
DATE: January 2021
SCALE: 0m 5m 10m

3.2 Existing Conditions

3.2.1 Existing Road Network

3.2.1.1 Roadways

The proposed development is bound by the following street(s):

- **Fallowfield Road** is a two-lane undivided urban arterial roadway under the jurisdiction of the City of Ottawa with a right-of-way protection of 44.5m. From Highway 416 heading east, Fallowfield Road has a posted speed of 80km/h. At the intersection with Strandherd Drive, Fallowfield Road takes a 90-degree turn to the northeast and continues through to the study area with a reduced speed limit of 60 km/h.
- **Lusk Street** is a two-lane local road extending from O'Keefe Court and terminates in a cul-de-sac approximately 250m to the southwest and provides access to the 4401 Fallowfield Road business park. Lusk Street has a 20m right-of-way and an unposted speed limit of 50 km/h.
- **Forager Street** is a two-lane local road linking Lusk Street to Fallowfield Road and also provides access to the 4401 Fallowfield Road business park. Forager Street has a 20m right-of-way and an unposted speed limit of 50 km/h

Other streets within the vicinity of the proposed development are as follows:

- **Strandherd Drive** is a four-lane divided urban arterial road under the jurisdiction of the City of Ottawa with a posted speed limit of 80 km/h within the vicinity of the subject lands, and a right-of-way protection of 44.5m.
- **O'Keefe Court** is a two-lane road extending west from Fallowfield Road and terminating in a cul-de-sac approximately 800m west of the Fallowfield Road and O'Keefe Court intersection. The roadway has a rural cross-section with a posted speed limit of 50km/h. O'Keefe Court runs along the former Fallowfield Road alignment (prior to its realignment to Strandherd Drive). Its right-of-way (ROW) therefore varies and is generally 30m, however, additional ROW has been taken on a portion of the north side to accommodate a multi-use pathway (MUP).
- **Cedarview Road** is a City of Ottawa roadway that extends from Strandherd Drive in the south to Baseline Road in the north. Cedarview Road is a two-lane urban arterial road north of Fallowfield Road, with a 37.5m right-of-way protection. Between Fallowfield Road and Jockvale Road, it is a major collector with a 26m right-of-way. The posted speed limit on Cedarview Road is 60 km/h. South of Strandherd Drive and the VIA Rail corridor, Cedarview Road has been renamed Borrisokane Road and continues south to Barnsdale Road.
- **Foxtail Avenue** is a two-lane local road extending from O'Keefe Court that provides access for the Orchard Estates residential community. The posted speed limit is 40 km/h.

3.2.1.2 Intersections

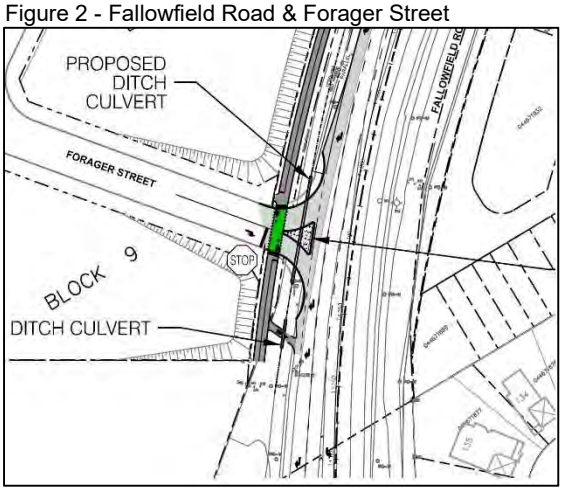
The following existing intersections have been identified as having the greatest potential to be impacted by the proposed development:

Fallowfield Road & O'Keefe Court / Cobble Hill Drive presently exists as a four-legged unsignalized intersection with stop-control on the O'Keefe Court and Cobble Hill Drive approaches. Each leg of the intersection is configured with a single through lane and auxiliary left-turn lane. Auxiliary right-turn lanes are provided along Fallowfield Road, while the sidestreets are configured with shared through-right lanes. The City of Ottawa is currently monitoring this intersection for implementation of traffic signals, once warranted.

Figure 1 - Fallowfield Road & O'Keefe Court / Cobble Hill Drive intersection

Fallowfield Road & Forager Street is a new three-legged intersection with an RMA which is intended to restrict access to right-in/right-out. A multi-use pathway (MUP) crossing is proposed on Forager Street to provide a connection for the future MUP to be located on the west side of Fallowfield Road. Each leg of the intersection is configured with a single through lane, with an auxiliary right-turn lane on the southbound approach only.

Figure 2 - Fallowfield Road & Forager Street



3.2.1.3 Traffic Management Measures

There are currently no traffic management or traffic calming measures on the boundary streets within the vicinity of the proposed development.

3.2.1.4 Nearby Driveways

There are currently no driveways within 200m of either proposed site access location. The adjacent Hampton Inn and Suites Hotel currently under construction and located immediately to the southwest of the 115 Lusk Street site will include private approaches, with the nearest being approximately 3 metres from the property line shared with the subject development.

3.2.1.5 Existing Traffic Volumes

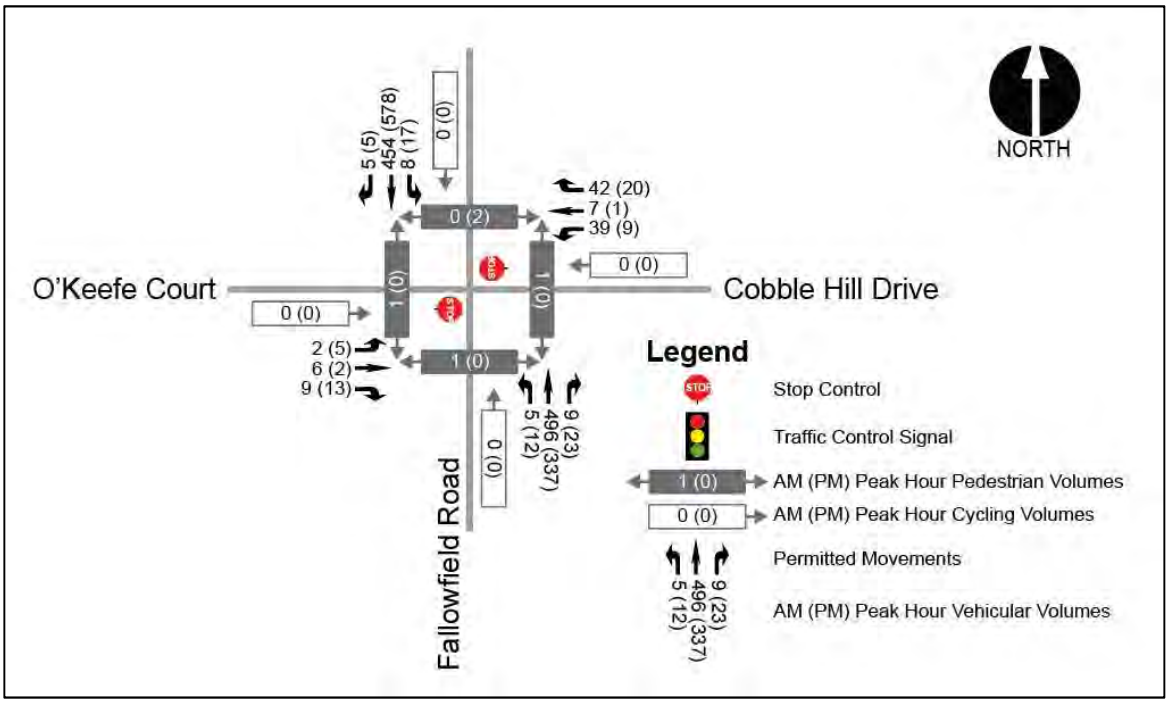
Weekday morning and afternoon peak hour turning movement counts were obtained by IBI staff at the following intersection(s):

- Fallowfield Road and O'Keefe Court/ Cobble Hill Drive (IBI Group – January 30, 2018)

A growth rate was applied to the through volumes along Fallowfield Road to approximate existing (2019) traffic volumes. Justification of background traffic volumes is discussed further in the Forecasting section of this report.

Peak hour vehicular, pedestrian and cyclist traffic volumes representative of existing (2019) conditions are shown in **Figure 3**. Traffic count data is provided in **Appendix C**.

Figure 3 - Existing (2019) Traffic



3.2.2 Existing Bicycle and Pedestrian Facilities

The section of Fallowfield Road within the context area is designated as a Spine cycling route, and presently provides paved shoulders on both sides of the road. A bike pocket exists along Fallowfield Road on the southbound approach to the Fallowfield Road & O'Keefe Court / Cobble Hill Drive intersection. A multi-use pathway (MUP) presently exists along the north side of O'Keefe Court from Lytle Park in the west to Cedarview Road in the east. Uni-directional cycle tracks are provided on both sides of Strandherd Drive from Fallowfield Road to Maravista Drive with cross-rides, two-stage left-turn bike boxes and bicycle signals at key signalized intersections within the context area. There are no exclusive bicycle facilities crossing Strandherd Drive, however pedestrian crosswalks are provided at each signalized intersection.

No formal pedestrian facilities are provided within the vicinity of the proposed development with the exception of concrete sidewalks (corner refuge) at the intersection of Fallowfield Road and O'Keefe Court/ Cobble Hill Drive, as well as within the reconstructed section of Strandherd Drive through the context area.

3.2.3 Existing Transit Facilities and Service

OC Transpo operates the following transit routes within close proximity to the proposed development:

- **Route #179** provides weekday peak period service between the Citi-Gate development off of Strandherd Drive and the Fallowfield VIA Rail Station and operates on a 15-minute headway.
- **Route #272** provides weekday peak period and peak direction service between the Cobble Hill residential development in Barrhaven South and Tunney's Pasture Station and operates on a 10-minute headway. Service is provided from Barrhaven to downtown in the morning peak period and the reverse in the afternoon.

The nearest bus stops to the proposed development are located on Cobble Hill Drive, just east of Fallowfield Road and provide access to Route 272 only. Although these bus stops are located only 270 metres from the site, there is presently no controlled pedestrian crossing of Fallowfield Road to facilitate access to transit from the proposed development. Further, there are currently no bus stops for Route 179 within reasonable walking distance to the proposed development.

Transit service maps for the above noted transit routes are provided in **Appendix D**.

3.2.4 Collision History

A review of historical collision data has been conducted for the road network surrounding the proposed development. The TIA Guidelines require a safety review if at least six collisions for any one movement or of a discernible pattern, over a five-year period have occurred. **Table 2** summarizes all reported collisions between January 1, 2014 and December 31, 2018.

Table 2 - Reported Collisions within Vicinity of Proposed Development

LOCATION	# OF REPORTED COLLISIONS
INTERSECTIONS	
Fallowfield Road & Strandherd Drive	35
Fallowfield Road & O'Keefe Court / Cobble Hill Drive	1
SEGMENTS	
Fallowfield Road – Strandherd Drive to O'Keefe Court / Cobber Hill Drive	1
O'Keefe Court – Fallowfield Road to cul-de-sac	1

Based on the collision history summarized above, the Fallowfield Road & Strandherd Drive intersection may require further review in the Analysis section of the report.

Detailed collision records are provided in **Appendix E**.

3.3 Planned Conditions

3.3.1 Transportation Network

3.3.1.1 Future Road Network Projects

The 2013 Transportation Master Plan (TMP) outlines future road network modifications in the 2031 'Affordable Network'. The following projects were noted that may have an impact on traffic patterns within the vicinity of the site:

- **Strandherd Drive** – Planned widening of Strandherd Drive from two to four lanes. The first phase included widening between Fallowfield Road and Maravista Drive (Phase 1:

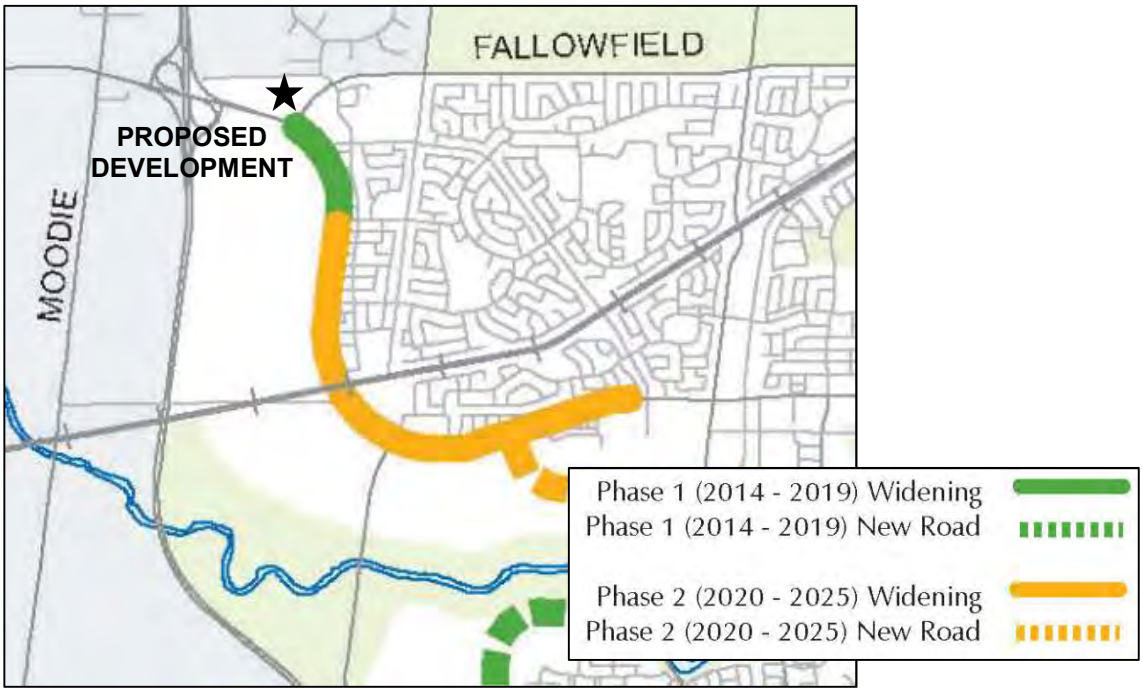
2014-2019) and was completed in 2015. The second phase includes widening between Maravista Drive and Jockvale Road (Phase 2: 2020-2025).

The *2019 City-Wide Development Charges Background Study (March 15, 2019)* identifies the following revisions for the timing of the TMP road network modifications described above:

- **Strandherd Drive Phase 2** – The timing for the second phase of the planned widening has been revised to 2020-2024.

Figure 4 illustrates the planned changes to the arterial road network projects in the broader area, as per the TMP Affordable Plan.

Figure 4 - Future Road Network Projects



Source: 2013 Transportation Master Plan – Map 11 '2031 Affordable Network'

Although not part of the '2031 Affordable Network' the TMP indicates that Fallowfield Road may be widened between Strandherd Drive and Greenbank Road some time beyond the TMP's 2031 horizon.

3.3.1.2 Future Transit Facilities and Services

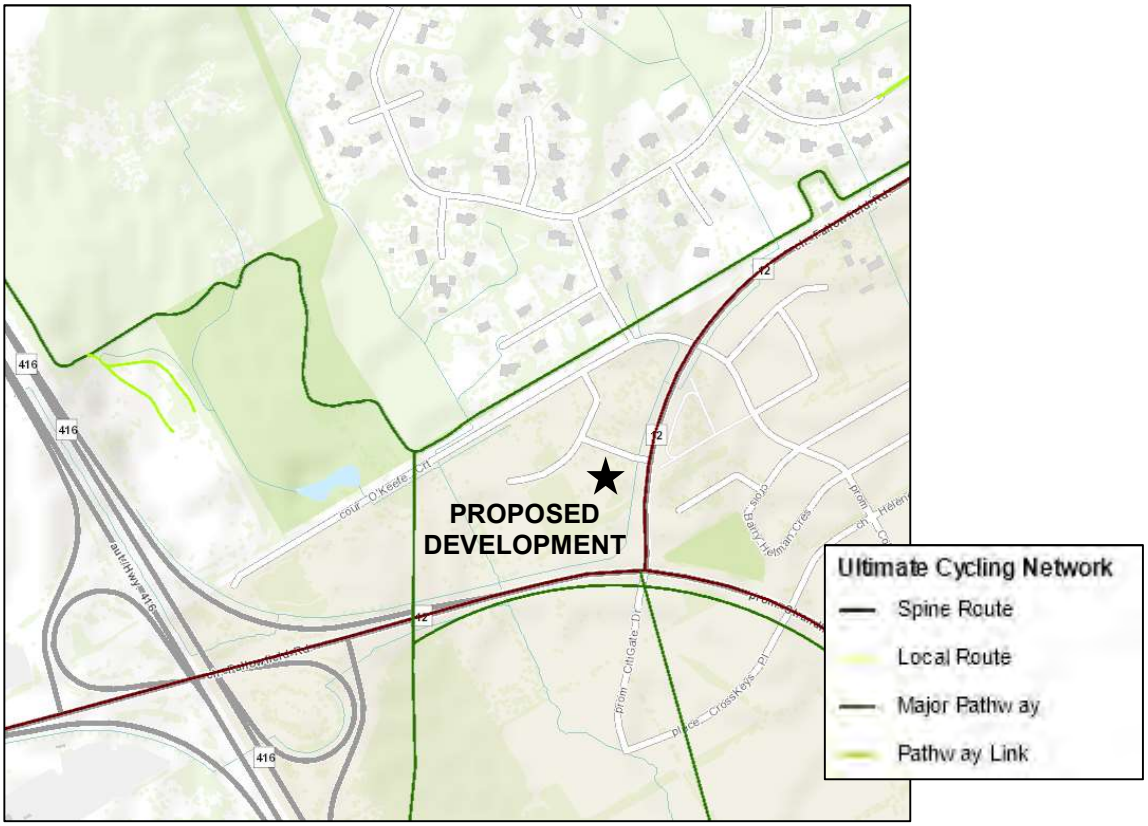
The 2013 TMP outlines the future rapid transit and transit priority (RTTP) network. The TMP does not identify any planned RTTP projects within the vicinity of the proposed development as part of the '2031 Affordable Network' or '2031 Network Concept'. The Roadway Modification Application (RMA) completed for the Fallowfield/ Forager intersection originally included a new southbound bus stop on Fallowfield Road south of O'Keefe Court, however OC Transpo has deferred the installation of this bus stop until after the intersection becomes signalized.

3.3.1.3 Future Cycling and Pedestrian Facilities

Although Fallowfield Road is identified as a Spine cycling route, the Ottawa Cycling Plan (2013) does not describe any planned improvements to bicycle infrastructure along this section of roadway within the study area.

A proposed north-south Major Pathway, identified as part of the Ultimate Cycling Network, will connect to the existing multi-use pathway north of O'Keefe Court, continue south through 4401 Fallowfield Road prior to following Highway 416 towards the Jock River. **Figure 5** shows the future cycling network in the vicinity of the proposed development. The RMA includes a portion of the multi-use pathway on the west side of Fallowfield Road along the 4401 Fallowfield subdivision frontage.

Figure 5 - Ultimate Cycling Network



No additional pedestrian network modifications are planned within the vicinity of the proposed development.

3.3.2 Future Adjacent Developments

The City of Ottawa Transportation Impact Assessment (TIA) Guidelines specify that all significant developments proposed within the surrounding area which are likely to occur within the study's horizon year must be identified and taken into consideration in the development of future background traffic projections.

The subject site forms part of the 4401 Fallowfield Road Plan of Subdivision (previously referred to as the Highway 416 Lands development). It is located in the northwest quadrant of the Fallowfield Road and Strandherd Drive intersection that will eventually consist of two hotels and an office park.

All current development applications within the context area of the proposed development have been summarized below in **Table 3**.

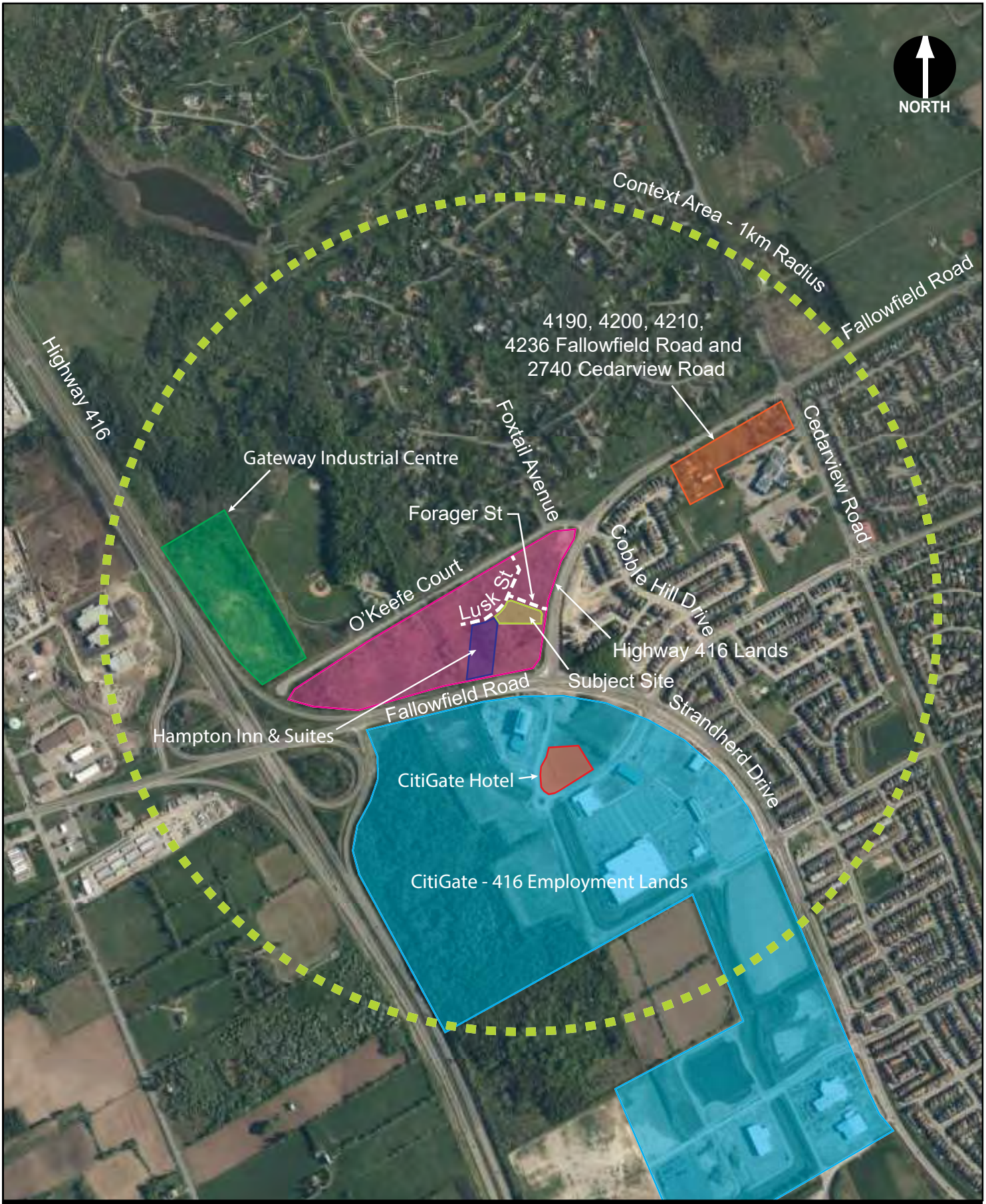
Table 3 - Future Adjacent Developments

DEVELOPMENT	TIA	LAND USE AND SIZE	TARGETED BUILD-OUT [1]
Highway 416 Lands (4401 Fallowfield Road)	IBI Group (2015)	• 2 Hotels • 496,168 ft^2 Business Park	2017
Hampton Inn & Suites [2]	IBI Group (2018)	• 102 Hotel Rooms	2019
Gateway Industrial Centre (4497 O'Keefe Court)	Delcan (2008)	• 279,653 ft^2 General Light Industrial	Unknown
4190, 4200, 4210, 4236 Fallowfield Road and 2740 Cedarview Road	Novatech (2018)	• 194 Residential Units	2023
CitiGate – 416 Employment Lands	Novatech (2012)	• 350,000 ft^2 Shopping Centre • 200 Hotel Rooms • Gas Station (8 fuel positions) • 16.56 ha Business Park • 67.65 ha Office Park • 10.5 ha New Car Sales	2029
CitiGate Hotel (4433 Strandherd Drive) [3]	Novatech (2019)	• 99 Hotel Rooms	2020

Notes:

1. *Target build-out date may be outdated for some developments*
2. *Located within the Highway 416 Lands development.*
3. *Located within the City Gate – 416 Employment Lands development.*

The locations of the adjacent developments described above are shown in **Exhibit 3**.



IBI

115 Lusk Street
Transportation Impact Assessment

Exhibit 3:
Adjacent Developments

PROJECT No. 122508
DATE: January 2021
SCALE: 0m 125m 250m

3.3.3 Network Concept Screenline

Network screenline analysis is not expected to be necessary for this development, as it does not trigger the threshold prescribed in the TIA Guidelines of 200 person-trips or more during the peak hour. Detailed trip generation calculations will be provided in the Forecasting section of the report.

3.4 Study Area

The information presented thus far provides a base level of information for the development's context. Based on preliminary estimates of trip generation completed for the TIA Screening, the proposed development is expected to be a low traffic generator with roughly 60 person-trips expected during the weekday afternoon peak hour. Travel demand will be subsequently stratified by mode shares, divided amongst the two proposed site access intersections and further diluted by the variation in travel routes within the broader study area. As such, the proposed development is expected to contribute minimal downstream impacts to intersections on the periphery of the context area such as Cedarview Road and Fallowfield Road.

Strandherd Drive from Fallowfield Road to Maravista Drive was also exempt from the study area, as this segment of road was reconstructed in 2015 following the City's Complete Streets design philosophy to accommodate multi-modal travel demands beyond the TMP's ultimate planning horizon of 2031. Consideration was given to the proposed development travel demands as part of the Highway 416 Lands CTS.

With respect to the exemptions discussed above, this TIA will focus on site-specific impacts, integration with its boundary streets, including a functional review of the site access geometry and intersection control, on-site drive aisle requirements to accommodate proposed design vehicles and a review of the site's parking and loading requirements.

A condensed study area is proposed for this TIA, which will consist of the following intersections:

- Fallowfield Road & O'Keefe Court / Cobble Hill Drive
- O'Keefe Court & Lusk Street
- Fallowfield Road & Forager Street

The study area is consistent with the recent TIA for the adjacent Hampton Inn and Suites.

Multi-modal level of service (MMLOS) analysis will be limited to Fallowfield Road between Forager Street and O'Keefe Court. Intersection MMLOS is only required for signalized intersections, and based on the low traffic generation projected for this development, it is unlikely that it will trigger the need for traffic signals at any of the three study area intersections. This will be verified through intersection capacity analysis in the Analysis component of the report.

3.5 Time Periods

Based on a preliminary review of trip generation rates associated with the proposed land uses, the peak weekly traffic generation is expected to occur on Saturdays. For the purposes of comparison, the weekday morning and afternoon peak periods represent 37% and 87% of this peak demand, respectively. It is important to note however that the Saturday peak likely does not coincide with the peak hour of adjacent street traffic, therefore the weekday morning and afternoon peak hour will constitute the critical analysis periods for this study.

3.6 Study Horizon Year

Traffic analyses associated with TIA's typically involve a review of existing conditions, as well as the anticipated future conditions, both with- and without the proposed development, at the year of

full-occupancy as well as five years beyond. Phased developments will often require interim analyses to provide a timeline for any necessary transportation infrastructure improvements.

It is expected that the proposed development will be constructed and fully occupied in a single phase in 2023. The horizon year for this study is therefore 2028.

3.7 Exemptions Review

The TIA Guidelines provide exemption considerations for elements of the Design Review and Network Impact components. **Table 4** summarizes the TIA modules that are not applicable to this study.

Table 4 - Exemptions Review

TIA MODULE	ELEMENT	EXEMPTION CONISDERATIONS	REQUIRED
DESIGN REVIEW COMPONENT			
4.1 Development Design	4.1.2 Circulation and Access	• Only required for site plans	✓
	4.1.3 New Street Networks	• Only required for plans of subdivision	✗
4.2 Parking	4.2.1 Parking Supply	• Only required for site plans	✓
	4.2.2 Spillover Parking	• Only required for site plans where parking supply is 15% below unconstrained demand	✗
NETWORK IMPACT COMPONENT			
4.5 Transportation Demand Management	All Elements	• Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	✗
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	• Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	✓
4.8 Network Concept	n/a	• Only required when proposed development generates more than 200 person-trips during the peak hour in excess of the equivalent volume permitted by established zoning	✗

4 Forecasting

4.1 Development Generated Traffic

4.1.1 Trip Generation Methodology

Peak hour site-generated traffic volumes were developed using the Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition). The TIA Guidelines indicate that vehicle-trip generation rates from the ITE Trip Generation Manual should be converted to person-trips through the application of a 1.28 vehicle-to-person-trip conversion factor.

Following the application of the vehicle-to-person-trip conversion factor, the person-trips were then subdivided based on representative mode share percentages applicable to the study area to determine the number of vehicle, transit, pedestrian, cycling and other trip types.

Target mode shares were developed based on the local mode shares from the OD Survey and adjusted to account for Condition 6b of the Conditions of Approval of the Draft Plan of Subdivision of 4401 Fallowfield Road. Condition 6b indicates that all TIAs prepared for Site Plan Applications within the 4401 Fallowfield Road subdivision must assume a maximum non-auto mode share (transit, walking, cycling and other) of 15%. Furthermore, Condition 6a indicates that the cumulative vehicle-trip generation of all sites within the 4401 Fallowfield Road subdivision shall not exceed 739 vehicles per hour during the weekday morning and afternoon peak periods.

4.1.2 Trip Generation Results

4.1.2.1 Base Vehicle Trip Generation

Peak hour vehicular traffic volumes associated with the 115 Lusk Street development were determined using appropriate peak hour trip generation rates from the ITE Trip Generation Manual.

The vehicular trip generation results for the proposed development have been summarized in **Table 5**.

Table 5 - Base Vehicular Trip Generation Results

LAND USE	SIZE	PERIOD	GENERATED TRIPS (VPH)		
			IN	OUT	TOTAL
720 – Medical Offices	560 m^2	AM	11	6	17
		PM	8	13	21
931 – Quality Restaurant	280 m^2	AM	1	1	2
		PM	16	8	24

Notes: vph = Vehicles per Hour

4.1.2.2 Person Trip Generation

The TIA Guidelines indicate that a 1.28 vehicle-to-person-trip conversion rate should be utilized to convert the base vehicular trip generation results into person trips.

The resulting number of person-trips the proposed development is expected to generate is summarized in **Table 6** below.

Table 6 - Person-Trip Generation

LAND USE	PERIOD	PERSON TRIPS (PPH)		
		IN	OUT	TOTAL
Medical Offices	AM	13	8	21
	PM	11	16	27
Quality Restaurant	AM	1	1	2
	PM	20	10	30

Notes: pph = persons per hour

4.1.2.3 Mode Share Proportions

The 2011 TRANS Origin-Destination (O-D) Survey provides approximations of the existing modal share within the South Nepean Traffic Assessment Zone (TAZ). Relevant extracts from the 2011 O-D Survey are provided in **Appendix F**.

Of the available data, the average of the weekday AM and PM peak 'Within District' mode shares was determined to be the most appropriate existing mode share references, as the subject development is expected to primarily draw traffic from the local area.

Given the context of the proposed development, the mode shares specific to this development may deviate from the average mode share experienced in the South Nepean TAZ. As discussed below, adjustments were made to all the mode shares to better represent the mode shares for the proposed development.

The subject development is located on the opposite side of Fallowfield Road from the majority of the local residential developments, with only one signalized intersection in its vicinity providing a controlled crossing of Fallowfield Road. At present, limited active transportation facilities are provided in the study area and therefore there is a decreased likelihood of significant pedestrian or cycling demand being generated by the site. It is expected, however, that the intersection of Fallowfield Road & O'Keefe Court / Cobble Hill Drive will eventually become signalized which will improve the accessibility of the site for pedestrians. This is expected to result in an increase in pedestrian demand which is reflected in the 2028 mode share targets.

Given the low probability of site-generated trips occurring by non-auto travel modes (transit, cycling, walking and other) within the horizon year of this study, the mode shares of all non-auto travel modes were proportionally adjusted to yield a total non-auto mode share of 15% in accordance with the Conditions of Approval for 4401 Fallowfield Road. The difference in mode share was reallocated to the auto driver and auto passenger mode shares.

Table 7 below summarizes the 2011 OD Survey mode shares as well as the target mode shares.

Table 7 - 2011 OD Survey Mode Shares and Proposed Mode Share Targets

TRAVEL MODE	2011 OD SURVEY MODE SHARES	2023 MODE SHARE TARGETS	2028 MODE SHARE TARGETS
Auto Driver	40%	57%	57%
Auto Passenger	20%	28%	28%
Total Auto Mode Share	**60%**	**85%**	**85%**
Transit	4%	2%	2%
Cycling	2%	0%	0%
Walking	19%	7%	13%
Other	16%	6%	0%
Total Non-Auto Mode Share	**40%**	**15%**	**15%**

4.1.2.4 Trip Reduction Factors

Deduction of Existing Development Trips

Not Applicable: The proposed development lands are currently undeveloped, and do not generate any traffic volumes.

Pass-by Traffic

Based on survey data collected for the *ITE Trip Generation Handbook (3rd edition),* the Quality Restaurant land use was shown to generate an average of 44% pass-by trips. This study conservatively did not apply any pass-by reduction factors, as the overall impact on the adjacent road network is expected to be minimal.

Synergy/ Internalization

Not Applicable: The proposed development will not generate internal person-trips between the proposed land uses. Non-auto trips are likely to occur to/from other sites within the 4401 Fallowfield Road subdivision, such as the adjacent Hampton Inn and Suites.

4.1.2.5 Trip Generation by Mode

The mode share targets from **Table 7** were applied to the number of development-generated person-trips to establish the expected number of trips per travel mode, as summarized in **Table 8** below.

Table 8 - Peak Hour Person Trips by Mode

MODE	2023				2028			
	AM		PM		AM		PM	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT
Auto Driver	8	5	17	15	8	5	17	15
Auto Passenger	4	3	9	7	4	3	9	7
Transit	0	0	1	0	0	0	1	0
Cycling	0	0	0	0	0	0	0	0
Walking	1	1	2	2	2	2	4	4
Other	1	1	2	2	0	0	0	0
Total	**24**		**57**		**24**		**57**	

4.1.2.6 Cumulative 4401 Fallowfield Road Trip Generation

Condition 6A of the Conditions of Approval of the Draft Plan of Subdivision of 4401 Fallowfield Road indicates that the total vehicle-trip generation of the subdivision shall not exceed 739 vehicle-trips per hour during the weekday morning and afternoon peak hours. **Table 9** summarizes the total and cumulative number of vehicle-trips generated during the weekday morning and afternoon peak hours by all sub-developments within 4401 Fallowfield Road subdivision which have been approved or are currently undergoing a Site Plan Control Application.

Table 9 - Cumulative 4401 Fallowfield Road Trip Generation

SUB-DEVELOPMENT	TOTAL AM (PM) VEHICLE TRIPS	CUMULATIVE AM (PM) VEHICLE TRIPS
Hampton Inn & Suites	56 (64)	56 (64)
115 Lusk Street	13 (32)	69 (96)
Total from Current Development Applications		**69 (96)**
Total Allowable Vehicle-Trip Generation		**739 (739)**
Percentage of Maximum Trips Permitted		**9% (13%)**

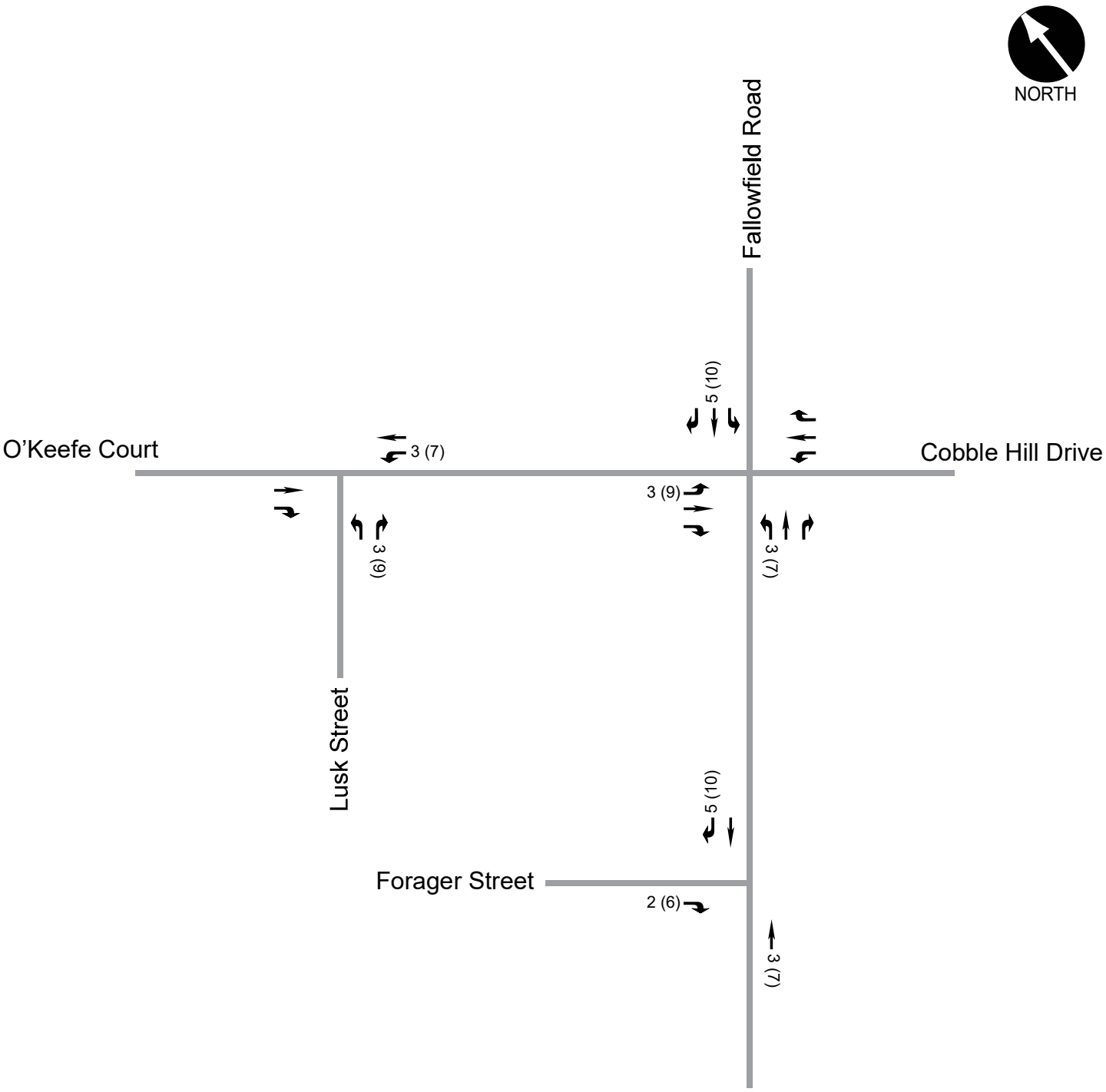
As indicated above, the proposed development will not exceed the maximum permissible vehicular generation of the 4401 Fallowfield Road subdivision.

4.1.3 Trip Distribution and Assignment

As the proposed development is expected to primarily draw traffic from local residential areas, site-generated traffic has been distributed to the road network based on the concentrations of housing in the vicinity of the subject development:

- 40% to/from the southwest via Fallowfield Road
- 60% to/from the east via Fallowfield Road

Utilizing the estimated number of new auto trips and applying the above distribution, future site-generated traffic volumes are illustrated for each of the study area intersections in **Exhibit 4**.



115 Lusk Street
Transportation Impact Assessment

Exhibit 4:
Site-Generated
AM & PM Peak Hour
Traffic

PROJECT No. 122508
DATE: January 2021
SCALE: N.T.S.

4.2 Background Network Traffic

4.2.1 Changes to the Background Transportation Network

To properly assess future traffic conditions, planned modifications to the transportation network that may impact travel patterns or demand within the study area must be considered. The Scoping section of this TIA reviewed the anticipated changes to the study area transportation network based on the Transportation Master Plan (TMP), the Ottawa Cycling Plan, the Ottawa Pedestrian Plan and the *2019 City-Wide Development Charges Background Study* and determined that there are no major road, pedestrian or cycling network modifications planned within the study area prior to the 2028 horizon.

The intersection of Fallowfield Road/ O'Keefe/ Cobble Hill is being monitored by City staff for traffic signal warrants. As discussed previously, an RMA was recently approved for the right-in/right-out intersection of Fallowfield Road & Forager Street which includes an isolated section of multi-use path (MUP) on the west side of Fallowfield Road.

4.2.2 General Background Growth Rates

The background growth rate is intended to represent regional growth from outside the study area that will travel along the adjacent road network. Consistent with the adjacent Hampton Inn & Suites TIA, a 2% rate of linear growth per annum is proposed within the study area for the calculation of future background traffic.

The background growth rate was only been applied to the through movements on Fallowfield Road as traffic generation relating to all known future adjacent developments has been explicitly accounted for in the analysis.

4.2.3 Other Area Development

All current adjacent development applications within the study area were previously identified in **Table 3**. All of the developments identified have been accounted for in the future background volume projections. The developments represent specific areas of growth within the study area and are therefore considered in addition to the general background growth rate discussed previously. **Table 10** summarizes the vehicle trip generation of all current adjacent background development applications.

Table 10 - Adjacent Development Vehicle Trip Generation

DEVELOPMENT	TIA	VEHICLE TRIP GENERATION			
		AM		PM	
		IN	OUT	IN	OUT
Highway 416 Lands (4401 Fallowfield Road)	IBI Group (2015)	630	109	137	533
Hampton Inn & Suites	IBI Group (2018)	33	23	33	31
Gateway Industrial Centre (4497 O'Keefe Court)	Delcan (2008)	20	97	94	46
4190, 4200, 4210, 4236 Fallowfield Road and 2740 Cedarview Road	Novatech (2018)	108	33	131	76
CitiGate – 416 Employment Lands	Novatech (2012)	**Interim (2019)**			
		741	216	664	1015
		Ultimate (2029)			
		3494	635	1128	3316
CitiGate Hotel (4433 Strandherd Drive)	Novatech (2019)	29	20	27	26

It should be noted that some of the developments shown in **Table 10** above are not expected to be fully built out by the horizon year of the study or are sub-developments within a larger development. Background development traffic volumes have been adjusted appropriately to account for this.

The CitiGate – 416 Employment Lands is a large multi-phase development that has been partially been built out and is expected to be fully built out by 2029. The projected traffic volumes generated by this development at the 2023 and 2028 analysis years were linearly interpolated and considered the development status at the time of the recorded traffic counts utilized in this study.

It was assumed that the Gateway Industrial Centre (4497 O'Keefe Court) development would be fully built out by the 2023 analysis year.

4.3 Demand Rationalization

The purpose of this section is to rationalize future travel demands within the study area to account for potential capacity limitations in the transportation network and its ability to effectively accommodate the additional demand generated by a new development.

4.3.1 Description of Capacity Issues

The TIA recently completed for the adjacent Hampton Inn and Suites indicated study area intersections including Fallowfield Road & O'Keefe Court/ Cobble Hill Drive as well as Lusk Street/ O'Keefe Court would operate below their theoretical capacities (i.e. LOS 'D' or better) beyond the build-out year of the proposed development.

4.3.2 Adjustment to Development Generated Demands

The proposed development is only expected to generate 32 two-way vehicle-trips during the weekday morning and afternoon peak hours of adjacent street traffic and therefore unlikely to trigger any capacity issues.

4.3.3 Adjustment to Background Network Demands

As no further capacity issues have been identified, no adjustments to background network demands are necessary.

The TIA recently completed for Hampton Inn and Suites did not assign any traffic to the Fallowfield/ Forager intersection. Now that the current study has assumed a reassignment of trips to this intersection.

4.4 Traffic Volume Summary

4.4.1 Future Background Traffic Volumes

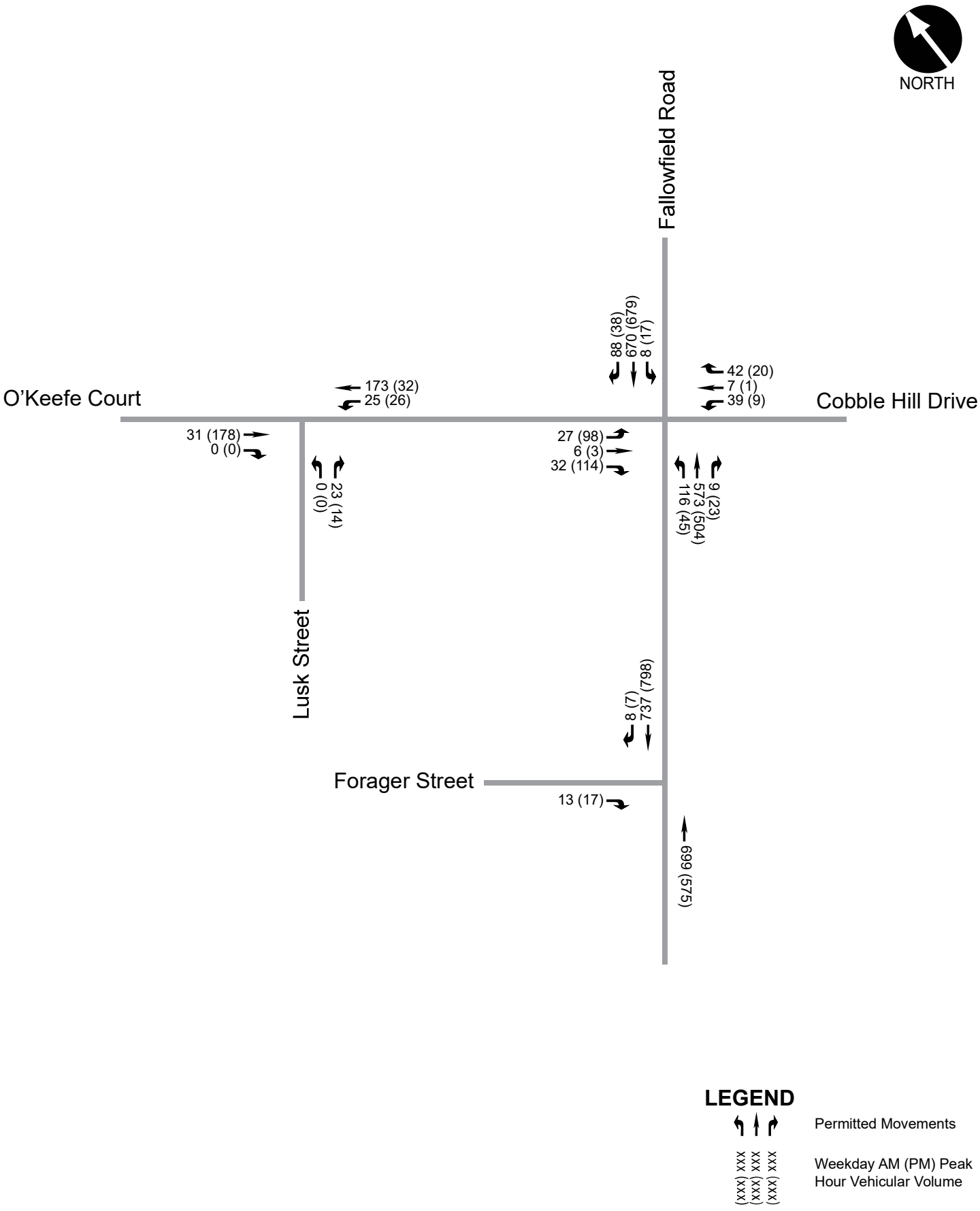
Future background traffic volumes projections have been established by combining the adjacent development traffic and background traffic derived through the application of a growth rate as discussed previously.

Exhibit 5 and **Exhibit 6** present the future background traffic volumes anticipated for the 2023 build-out year, as well as the 2028 study horizon, respectively.

4.4.2 Future Total Traffic Volumes

Future total volumes have been derived by combining the site-generated traffic from **Exhibit 4** with the future background volumes from **Exhibit 5** and **Exhibit 6**.

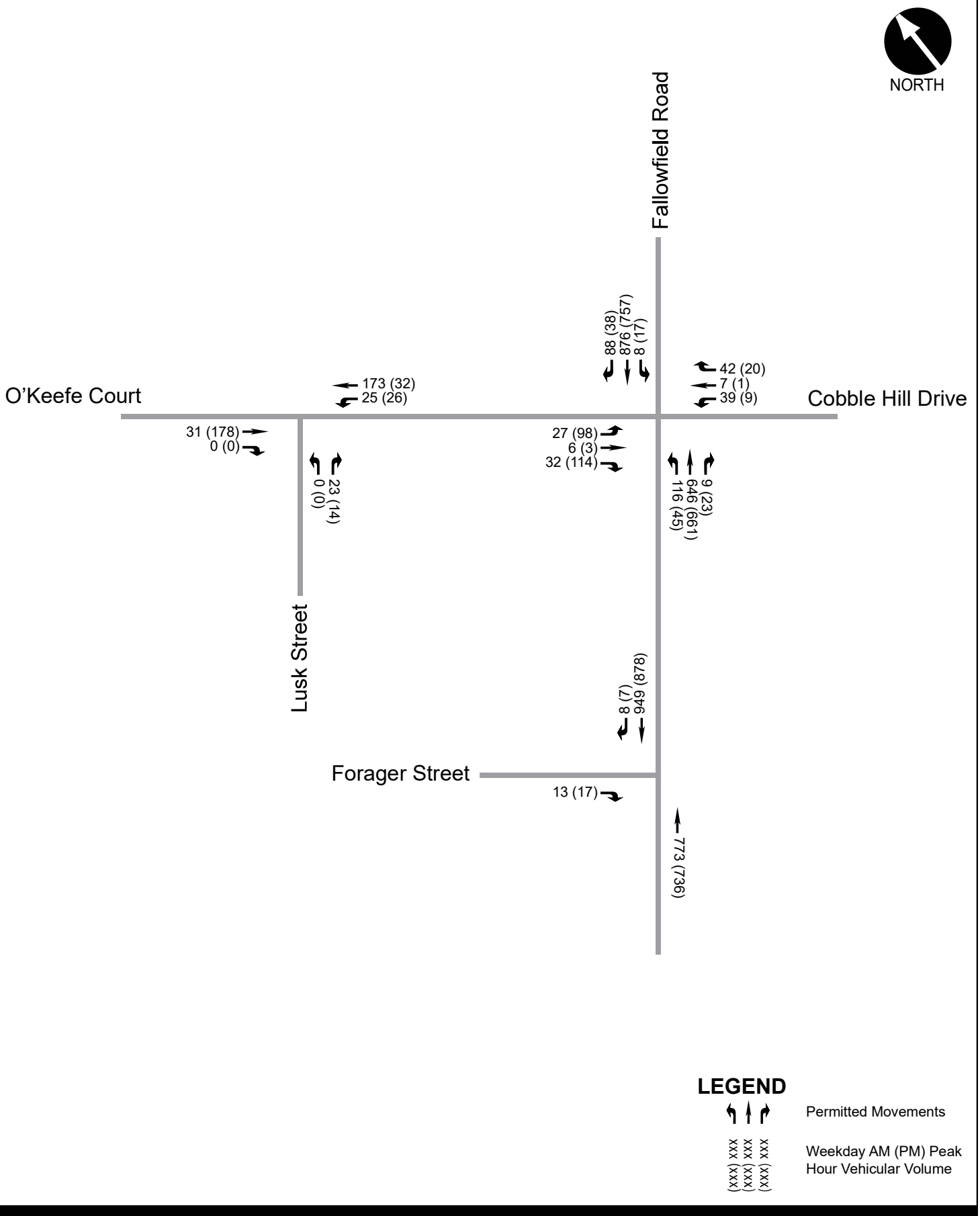
Exhibit 7 and **Exhibit 8** present the future total traffic volumes anticipated for 2023 and 2028 analysis years, respectively.



115 Lusk Street
Transportation Impact Assessment

Exhibit 5:
Future (2023) Background Traffic

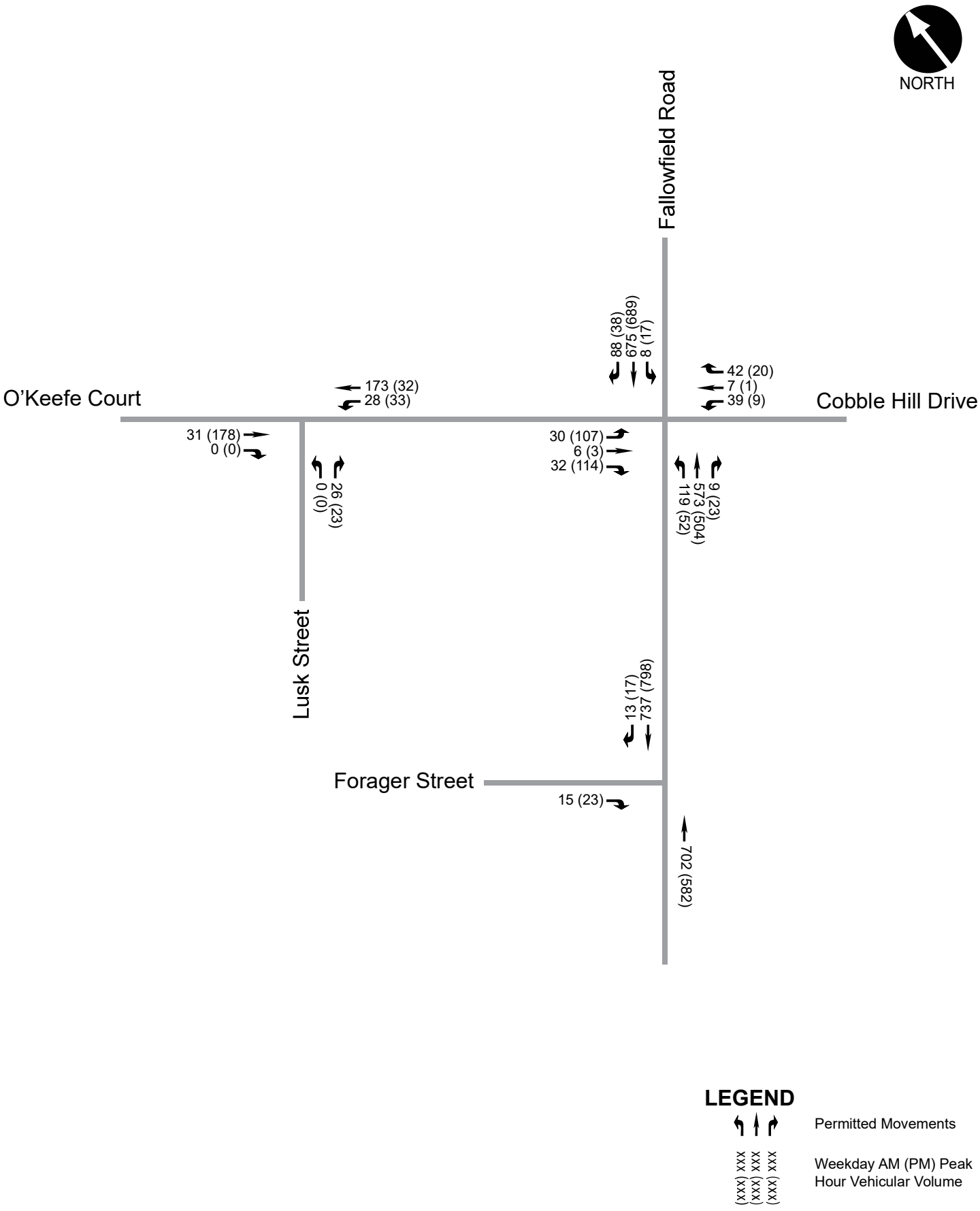
PROJECT No. 122508
DATE: January 2021
SCALE: N.T.S.



115 Lusk Street
Transportation Impact Assessment

Exhibit 6:
Future (2028) Background Traffic

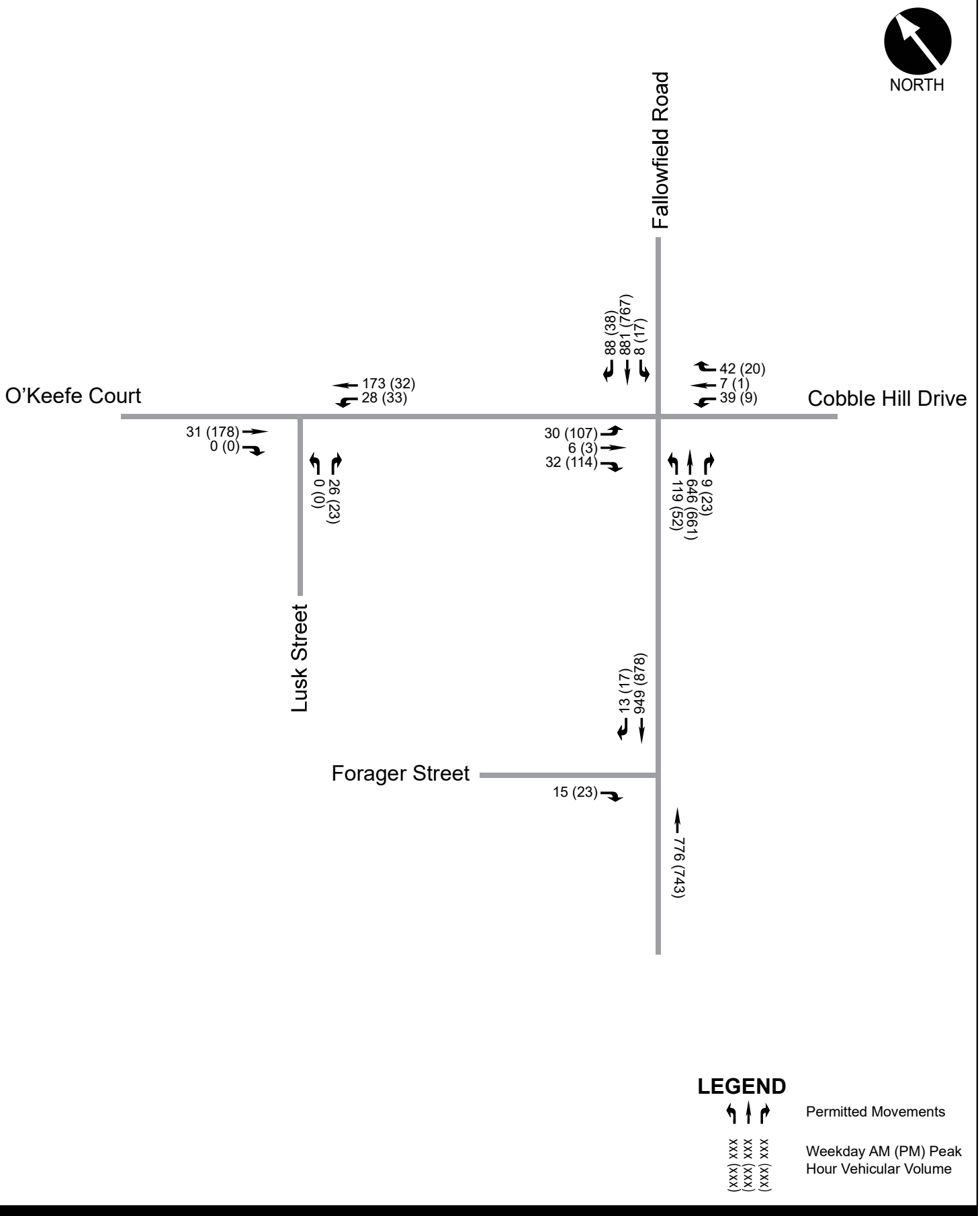
PROJECT No. 122508
DATE: January 2021
SCALE: N.T.S.



115 Lusk Street
Transportation Impact Assessment

Exhibit 7:
Future (2023) Total Traffic

PROJECT No. 122508
DATE: January 2021
SCALE: N.T.S.



115 Lusk Street
Transportation Impact Assessment

Exhibit 8:
Future (2028)
Total Traffic

PROJECT No. 122508
DATE: January 2021
SCALE: N.T.S.

5 Analysis

5.1 Development Design

5.1.1 Design for Sustainable Modes

The proposed development is located an approximate 600m walking distance from an existing bus stop at the corner of Fallowfield Road & O'Keefe Court / Cobble Hill Drive, assuming that transit users cross Fallowfield Road at Strandherd Drive. The RMA for the Fallowfield Road & Forager Street intersection originally included a new southbound bus stop on Fallowfield Road south of O'Keefe Court, which would ultimately reduce the walking distance to transit to approximately 200m, however a bus stop at this location has now been deferred until after the signalization of this intersection.

The TDM-Supportive Development Design and Infrastructure Checklist as well as the TDM Measures Checklist were completed and are provided in **Appendix G**. These checklists identify anticipated measures that are being considered in association with the proposed development to offset the vehicular impact on the adjacent road network.

5.1.2 Circulation and Access

The internal drive aisle is 6.7m, as dimensioned on the site plan in **Exhibit 2**, which is sufficient to accommodate a Fire Route, therefore circulation by waste collection and delivery vehicles will be easily accommodated. Further, both proposed site access driveways will have 6m curb radii.

Vehicle turning templates for front-loading waste collection and medium single unit (MSU) design vehicles are presented in **Figure 6** and **Figure 7**, respectively.

Figure 6 – Turning Templates (Waste Collection)

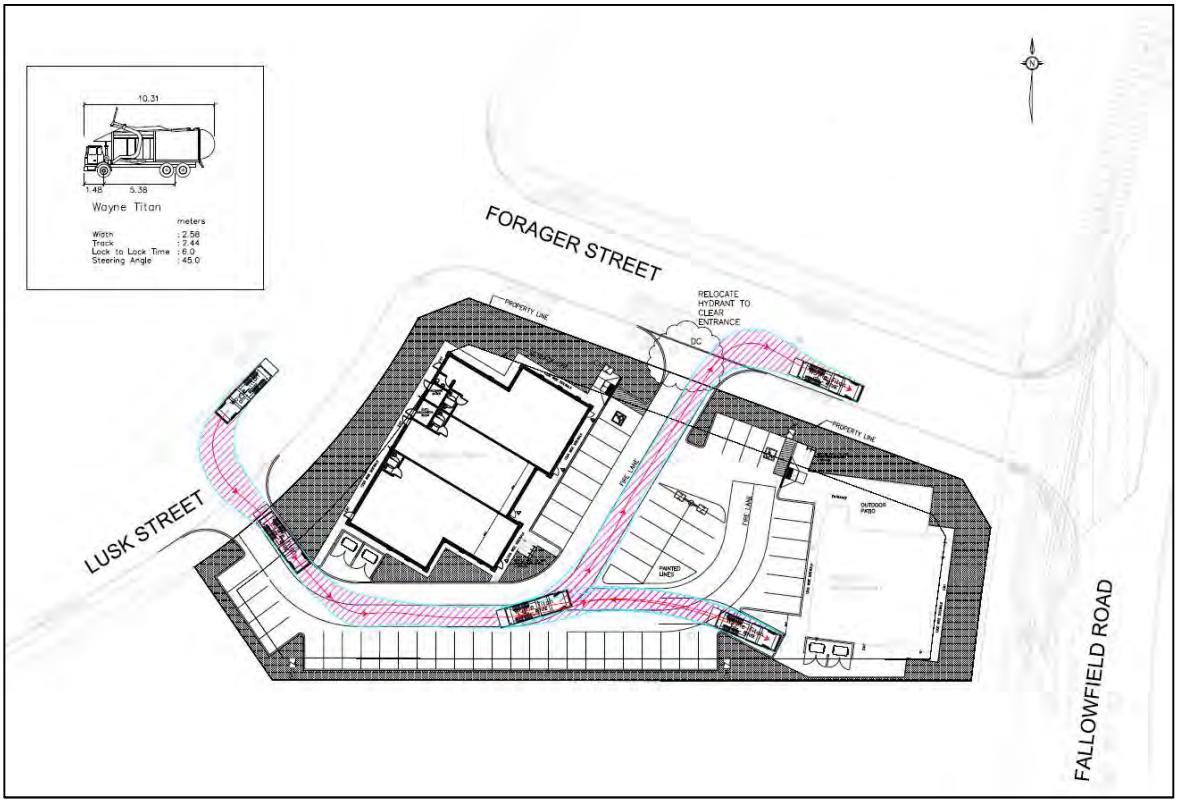
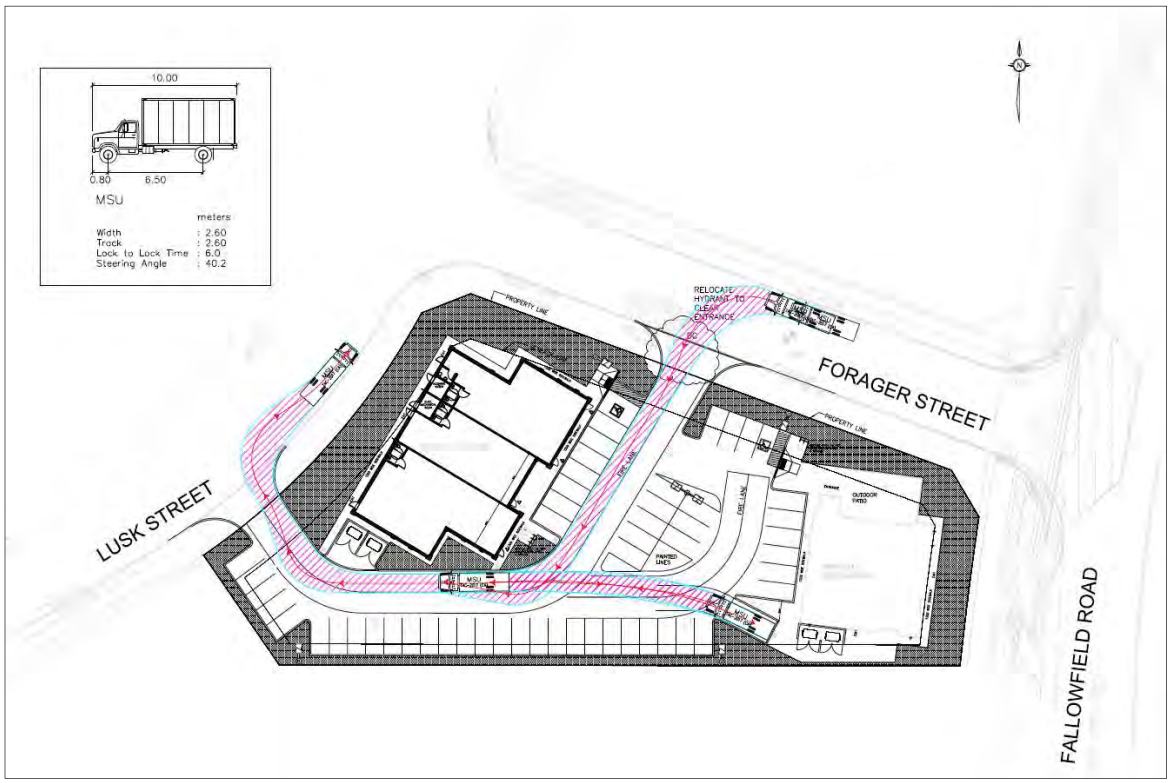


Figure 7 – Turning Templates (MSU)



5.1.3 New Street Networks

Not Applicable: The New Street Networks element is exempt from this TIA, as defined in the study scope. This element is not required for Site Plan Control applications.

5.2 Parking

5.2.1 Parking Supply

Based on the size of the proposed restaurant and medical office, a minimum of 45 vehicle parking spaces are required to meet the Zoning Bylaw requirements. The site plan indicates that 54 vehicle parking spaces will be provided, therefore the proposed parking supply is within the permissible range.

The Zoning Bylaw also requires a minimum number of bicycle parking spaces for each land use within the subject development. A total of five bicycle parking spaces will be provided, exceeding the three spaces required.

5.2.2 Spillover Parking

The minimum parking supply requirement specified in the Zoning Bylaw has been met, therefore, no further review of parking is necessary for the purposes of this study.

5.3 Boundary Streets

There are three existing boundary streets adjacent to the proposed development: Lusk Street, Forager Street and Fallowfield Road. As discussed in Section 3.4, segment-based MMLOS analysis will be limited to Fallowfield Road between Forager and O'Keefe/ Cobble Hill.

Both Lusk Street and Forager Street are classified as local roads, and were recently constructed in accordance with the latest City road design standards, therefore no Multi-Modal Level of Service (MMLOS) analysis is provided for either road segment. Given their classification as 'local' roads, both are in essence Complete Streets, as they provide sufficient facilities for active and motorized modes of travel. Concrete sidewalks 2.0 metres in width are proposed along one side of each local road. A sidewalk is provided along the proposed development's frontage on Lusk Street, which will continue across the site access driveway, while the sidewalk on Forager Street will be constructed on the north side of the road, opposite the development. As such, the inclusion of site access driveways along Lusk Street and Forager Street are not anticipated to negatively impact the design of either local road.

5.3.1 Mobility

Segment-based Multi-Modal Level of Service (MMLOS) results for Fallowfield Road between Forager Street and O'Keefe Court / Cobble Hill Drive are provided in **Table 11** below.

Details of the MMLOS analysis are provided in **Appendix H**.

Table 11 - Segment MMLOS Results

LOCATION	LEVEL OF SERVICE BY MODE			
	PEDESTRIAN (PLOS)	BICYCLE (BLOS)	TRANSIT (TLOS)	TRUCK (TkLOS)
EXISTING CONDITIONS				
Fallowfield Road – Forager Street to O'Keefe Court / Cobble Hill Drive	**F** (Target: C)	**F** (Target: C)	D (Target: D)	C (Target: E)
FUTURE CONDITIONS				
Fallowfield Road – Forager Street to O'Keefe Court / Cobble Hill Drive	**D** (Target: C)	A (Target: C)	D (Target: D)	C (Target: E)

Based on the above, this segment of Fallowfield Road is not currently meeting its pedestrian and bicycle level of service targets. The construction of the multi-use path on the west of Fallowfield Road will improve the PLOS and BLOS to 'D' and 'A', respectively. In order to meet the PLOS target, operating speeds on Fallowfield Road would need to be reduced to 60 km/h or less.

5.3.2 Road Safety

A summary of all reported collisions within the study period over the past 5 years was presented in the Scoping section of this TIA. The City requires a safety review if at least six collisions for any one movement or of a discernible pattern, over a five-year period have occurred. Based on the review of re-occurring events identified in the Scoping section of this report, none of the study area roadway segments or intersections require further analysis.

5.4 Access Intersections

5.4.1 Location and Design of Access

The proposed development will provide two new full-movement access intersections: one on Lusk Street and the other on Forager Street. The proposed site access driveways are in conformance

with the City of Ottawa Private Approach By-law 2003-447, with particular confirmation of the following items:

- Width: A private approach should have a minimum width of 2.4m and a maximum width of 9.0m.
    - Both site access driveways will be 6.7m wide. ✓
- Distance from Intersecting Road: For a commercial development on or within 46m of an arterial or major collector with between 50 and 99 parking spaces, the proposed private approach must be at least 30 metres from the nearest intersecting street line.
    - The proposed access on Forager Street is approximately 45m from the nearest intersecting street line at Fallowfield Road and is therefore in compliance with the by-law.
- Quantity and Spacing of Private Approaches: For sites with frontage between 46 and 150 metres, one (1) two-way and two (2) one-way, or two (2) two-way private approaches are permitted. Any two private approaches must be separated by at least 9.0m and can be reduced to 2.0m in the case of two one-way driveways. On lots that abut more than one roadway, these provisions apply to each frontage separately.
    - The frontage on Lusk Street is 46m and therefore the single proposed two-way private approach is compliant with the by-law. ✓
    - The frontage on Forager Street is 73m and therefore the single proposed two-way private approach is compliant with the by-law. ✓
- Distance from Property Line: Private approaches must be at least 3.0m from the abutting property line, however this requirement can be reduced to 0.3m provided that the access is a safe distance from the access serving the adjacent property, sight lines are adequate and that it does not create a traffic hazard.
    - Both proposed private approaches exceed the minimum distance required. ✓
- Grade of Private Approach: The grade of a private approach serving a parking area of more than 50 spaces must not exceed 2% within the private property for a distance of 9m from the highway/curb line.
    - The grade of both private approaches will not exceed 2% within 9m of the curb line. ✓

The Transportation Association of Canada's (TAC) Geometric Design Guide for Canadian Roads (June 2017) does not suggest a minimum clear throat length for site access driveways proposed on local roads. The clear throat length is provided to ensure that any queues that form due to on-site circulation blockages do not spillback onto collector and arterial roads. Given the low traffic volumes typically expected on local roads such as Lusk and Forager, occasional queue spillback is not likely to result in traffic operational issues.

5.4.2 Access Intersection Control

The proposed site access driveways on Lusk Street and Forager Street will both be stop-controlled, which is expected to be sufficient given the low site-generated traffic volumes presented in the Forecasting section of this report.

5.4.3 Intersection Design (MMLOS)

Not Applicable – Both proposed site access driveways will be unsignalized, therefore Multi-Modal Level of Service (MMLOS) analysis is not required.

5.5 Transportation Demand Management (TDM)

Not Applicable – The Transportation Demand Management (TDM) element is exempt from this TIA, as defined in the study scope. This element is not required for non-residential site plans that are projected to have fewer than 60 employees and/or students on location at any given time.

Based on the employee densities indicated in the *ITE Parking Generation Manual (4th Edition)* for the restaurant and medical office land uses, it is anticipated that there will only be up to 36 employees on site at any given time. As such, the TDM element is not required.

5.5.1 Context for TDM

Not Applicable.

5.5.2 Need and Opportunity

Not Applicable.

5.5.3 TDM Program

Not Applicable.

5.6 Neighbourhood Traffic Management

5.6.1 Adjacent Neighbourhoods

The proposed development relies on the following collector or lower-classification roads for access to the arterial road network: O'Keefe Court, Lusk Street and Forager Street. With the development of the 4401 Fallowfield Road Subdivision lands, O'Keefe Court is expected to function as a collector road, while Lusk Street and Forager Street will operate as local roads. To determine if neighbourhood traffic management measures are required, traffic volumes projected in the study horizon year are compared against the appropriate liveability thresholds, as prescribed in the TIA Guidelines.

The livability threshold for a local road is 120 vehicles per hour. Based on Future (2028) Total Traffic volumes, Lusk Street and Forager Street will be required to accommodate up to 56 and 40 vehicles per hour, respectively, during the weekday afternoon peak hour. As such, both local roads are anticipated to operate well below the 120 vehicle per hour threshold within the timeframe of this study.

Total traffic volume projections along O'Keefe Court indicate that it may slightly exceed its threshold of 300 vehicles per hour during the weekday afternoon peak hour, with up to 315 vehicles approaching Fallowfield Road. It should be noted, however, that it is not uncommon for a collector road to exceed this threshold approaching an arterial road, and that two-way volumes on O'Keefe Court through the remainder of the study area are expected to operate within this threshold. As such, a neighbourhood traffic management plan will not be required for this TIA.

5.7 Transit

5.7.1 Route Capacity

The estimated future site-generated transit passenger demand was provided in the Forecasting component of this study. The results have been summarized in **Table 12** below.

Table 12 - Development Generated Transit Demand

PERIOD	PEAK PERIOD DEMAND	
	IN	OUT
AM	0	0
PM	1	0

As indicated in **Table 12** above, the subject development is expected to contribute a negligible increase in transit ridership to the existing transit network, therefore no additional transit capacity will be required to accommodate the proposed development.

5.7.1 Transit Priority Measures

Transit priority measures are not required at any of the signalized study area intersections to support the projected travel demands within the timeframe of this study.

5.8 Review of Network Concept

Not Applicable – The Network Concept element is exempt from this TIA, as defined in the study scope. This element is not required for proposed developments expected to generate less than 200 person-trips during the weekday morning and afternoon peak hours.

5.9 Intersection Design

The following sections summarize the methodology and results of the multi-modal intersection capacity analysis conducted within the study area.

5.9.1 Intersection Control

5.9.1.1 Traffic Signal Warrants

Traffic signal warrants were completed for the intersection of Fallowfield Road & O'Keefe Court / Cobble Hill Drive. Based on the results of the analysis, traffic signals are not warranted at this intersection under Future (2028) Total Traffic conditions.

The results of the traffic signal warrant analysis are provided in **Appendix I**.

5.9.1.2 Roundabout Analysis

The feasibility of implementing a roundabout was evaluated at the intersection of Fallowfield & O'Keefe/ Cobble Hill. It was determined that this form of traffic control would not be feasible, given that only one of the suitability factors had been met.

The results of the Roundabout Feasibility Screening Tool are provided in **Appendix I**.

5.9.2 Intersection Analysis Criteria (Automobile)

The following section outlines the City of Ottawa's methodology for determining motor vehicle Level of Service (LOS) at signalized and unsignalized intersections.

5.9.2.1 Signalized Intersections

In qualitative terms, the Level of Service (LOS) defines operational conditions within a traffic stream and their perception by motorists. A LOS definition generally describes these conditions in

terms of such factors as delay, speed and travel time, freedom to manoeuvre, traffic interruptions, safety, comfort and convenience. LOS can also be related to the ratio of the volume to capacity (v/c) which is simply the relationship of the traffic volume (either measured or forecast) to the capability of the intersection or road section to accommodate a given traffic volume. This capability varies depending on the factors described above. LOS are given letter designations from 'A' to 'F'. LOS 'A' represents the best operating conditions and LOS 'E' represents the level at which the intersection or an approach to the intersection is carrying the maximum traffic volume that can, practicably, be accommodated. LOS 'F' indicates that the intersection is operating beyond its theoretical capacity.

The City of Ottawa has developed criteria as part of the Transportation Impact Assessment Guidelines, which directly relate the volume to capacity (v/c) ratio of a signalized intersection to a LOS designation. These criteria are as follows:

Table 13 - LOS Criteria for Signalized Intersections

LOS	VOLUME TO CAPACITY RATIO (v/c)
A	0 to 0.60
B	0.61 to 0.70
C	0.71 to 0.80
D	0.81 to 0.90
E	0.91 to 1.00
F	> 1.00

The intersection capacity analysis technique provides an indication of the LOS for each movement at the intersection under consideration and for the intersection as a whole. The overall v/c ratio for an intersection is defined as the sum of equivalent volumes for all critical movements at the intersection divided by the sum of capacities for all critical movements.

The Level of Service calculation is based on locally-specific parameters as described in the TIA Guidelines and incorporates existing signal timing plans obtained from the City of Ottawa. The analysis existing conditions utilized a Peak Hour Factor (PHF) of 0.90, while future conditions considers optimized signal timing plans and use of a Peak Hour Factor (PHF) of 1.0 to recognize peak spreading beyond a 15-minute period in congested conditions.

5.9.2.2 Unsignalized Intersections

The capacity of an unsignalized intersection can also be expressed in terms of the LOS it provides. For an unsignalized intersection, the Level of Service is defined in terms of the average movement delays at the intersection. This is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line; this includes the time required for a vehicle to travel from the last-in-queue position to the first-in-queue position. The average delay for any particular minor movement at the un-signalized intersection is a function of the capacity of the approach and the degree of saturation.

The Highway Capacity Manual 2010 (HCM), prepared by the Transportation Research Board, includes the following Levels of Service criteria for un-signalized intersections, related to average movement delays at the intersection, as indicated in **Table 14** below.

Table 14 - LOS Criteria for Unsignalized Intersections

LOS	DELAY (seconds)
A	<10
B	>10 and <15
C	>15 and <25
D	>25 and <35
E	>35 and <50
F	>50

The unsignalized intersection capacity analysis technique included in the HCM and used in the current study provides an indication of the Level of Service for each movement of the intersection under consideration. By this technique, the performance of the unsignalized intersection can be compared under varying traffic scenarios, using the Level of Service concept in a qualitative sense. One unsignalized intersection can be compared with another unsignalized intersection using this concept. Level of Service 'E' represents the capacity of the movement under consideration and generally, in large urban areas, Level of Service 'D' is considered to represent an acceptable operating condition. Level of Service 'E' is considered an acceptable operating condition for planning purposes for intersections located within Ottawa's Urban Core the downtown and its vicinity). Level of Service 'F' indicates that the movement is operating beyond its design capacity.

5.9.3 Intersection Capacity Analysis

Following the established intersection capacity analysis criteria described above, the existing and future conditions are analyzed during the weekday peak hour traffic volumes derived in this study.

The following section presents the results of the intersection capacity analysis. All tables summarize study area intersection LOS results during the weekday morning and afternoon peak hour periods.

The Synchro output files have been provided in **Appendix J**.

5.9.3.1 Existing (2019) Traffic

An intersection capacity analysis has been undertaken using the Existing (2019) Traffic volumes presented in **Figure 3**, yielding the following results:

Table 15 - Intersection Capacity Analysis: Existing (2019) Traffic

INTERSECTION	TRAFFIC CONTROL	AM PEAK HOUR		PM PEAK HOUR	
		OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)	OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)
Fallowfield Road & O'Keefe Court / Cobble Hill Drive	Unsignalized	D (26.0s)	EBL (26.0s)	D (27.4s)	EBL (27.4s)

Based on the above, the intersection of Fallowfield & O'Keefe/ Cobble Hill is operating at an acceptable level of service (LOS 'D' or better) under Existing Traffic conditions.

5.9.3.2 Future (2023) Background Traffic

An intersection capacity analysis has been undertaken using the Future (2023) Background Traffic volumes presented in **Exhibit 5**, yielding the following results:

Table 16 - Intersection Capacity Analysis: 2023 Background Traffic

INTERSECTION	TRAFFIC CONTROL	AM PEAK HOUR		PM PEAK HOUR	
		OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)	OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)
Fallowfield Road & O'Keefe Court / Cobble Hill Drive	Unsignalized	**F (83.6s)**	**WBTRL (83.6s)**	**F (104.6s)**	**EBL (104.6s)**
	Signalized	A (0.51)	WBTRL (0.56)	A (0.54)	EBL (0.60)
Lusk Street & O'Keefe Court	Unsignalized	A (8.5s)	NBRL (8.5s)	A (9.2s)	NBRL (9.2s)
Fallowfield Road & Forager Street	Unsignalized	B (13.8s)	EBR (13.8s)	B (14.7s)	EBR (14.7s)

By 2023, it is expected that the Fallowfield & O'Keefe/ Cobble Hill intersection will operate over its theoretical capacity as a stop-controlled intersection under background traffic conditions. Analysis indicates that signalization of the intersection will be required to achieve an acceptable level of service (LOS 'D' or better) during the weekday morning and afternoon peak hours.

The intersections of Lusk Street & O'Keefe Court and Fallowfield Road & Forager Street were shown to operate at Level of Service 'C' or better as two-way stop-controlled intersections, which is well within acceptable standards.

5.9.3.3 Future (2028) Background Traffic

An intersection capacity analysis has been undertaken using the Future (2028) Background Traffic volumes presented in **Exhibit 6**, yielding the following results:

Table 17 - Intersection Capacity Analysis: 2028 Background Traffic

INTERSECTION	TRAFFIC CONTROL	AM PEAK HOUR		PM PEAK HOUR	
		OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)	OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)
Fallowfield Road & O'Keefe Court / Cobble Hill Drive	Unsignalized	**F (229.5s)**	**WBTRL (229.5s)**	**F (252.6s)**	**EBL (252.6s)**
	Signalized	A (0.59)	SBT (0.60)	A (0.59)	EBL (0.60)
Lusk Street & O'Keefe Court	Unsignalized	A (8.5s)	NBRL (8.5s)	A (9.2s)	NBRL (9.2s)
Fallowfield Road & Forager Street	Unsignalized	C (16.8s)	EBR (16.8s)	C (15.8s)	EBR (15.8s)

Without signalization, traffic operations are expected to significantly deteriorate at the Fallowfield Road & O'Keefe Court / Cobble Hill Drive intersection under Future (2028) Background Traffic conditions, with average delays on some movements of approximately 4 to 5 minutes per vehicle. With signalization, the intersection is expected to operate at an acceptable Level of Service (LOS 'D' or better).

All other study area intersections are shown to operate acceptably (LOS 'D' or better) under Future (2028) Background Traffic conditions.

5.9.3.4 Future (2023) Total Traffic

An intersection capacity analysis has been undertaken using the Future (2023) Total Traffic volumes presented in **Exhibit 7**, yielding the following results:

Table 18 - Intersection Capacity Analysis: 2023 Total Traffic

INTERSECTION	TRAFFIC CONTROL	AM PEAK HOUR		PM PEAK HOUR	
		OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)	OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)
Fallowfield Road & O'Keefe Court / Cobble Hill Drive	Unsignalized	**F (85.1s)**	**WBTRL (85.1s)**	**F (133.4s)**	**EBL (133.4s)**
	Signalized	A (0.51)	WBTRL (0.56)	A (0.56)	EBL (0.62)
Lusk Street & O'Keefe Court	Unsignalized	A (8.5s)	NBRL (8.5s)	A (9.3s)	NBRL (9.3s)
Fallowfield Road & Forager Street	Unsignalized	B (13.8s)	EBR (13.8s)	B (14.8s)	EBR (14.8s)

With the addition of site-generated traffic, the Fallowfield Road & O'Keefe Court / Cobble Hill Drive intersection is expected to continue exceeding its theoretical capacity as an unsignalized intersection. As a signalized intersection, however, the intersection as a whole is expected to operate at a Level of Service of 'A'.

Both the Lusk Street & O'Keefe Court intersection and the Fallowfield Road & Forager Street are anticipated to operate at an acceptable Level of Service (LOS 'D' or better) under Future (2023) Total Traffic conditions.

5.9.3.5 Future (2028) Total Traffic

An intersection capacity analysis has been undertaken using the Future (2028) Total Traffic volumes presented in **Exhibit 8**, yielding the following results:

Table 19 - Intersection Capacity Analysis: 2028 Total Traffic

INTERSECTION	TRAFFIC CONTROL	AM PEAK HOUR		PM PEAK HOUR	
		OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)	OVERALL LOS (V/C OR DELAY)	CRITICAL MOVEMENTS (V/C OR DELAY)
Fallowfield Road & O'Keefe Court / Cobble Hill Drive	Unsignalized	**F (242.3s)**	**WBTRL (242.3s)**	**F (323.2s)**	**EBL (323.2s)**
	Signalized	A (0.59)	SBT (0.60)	B (0.62)	SBT (0.65)
Lusk Street & O'Keefe Court	Unsignalized	A (8.5s)	NBRL (8.5s)	A (9.3s)	NBRL (9.3s)
Fallowfield Road & Forager Street	Unsignalized	C (16.8s)	EBR (16.8s)	C (16.0s)	EBR (16.0s)

As observed under Future (2028) Background Traffic conditions, some movements at the Fallowfield Road & O'Keefe Court / Cobble Hill Drive intersection are expected to experience long delays of approximately 4 to 5 minutes if the intersection remains unsignalized. If the intersection were signalized, then the overall Level of Service would improve to a LOS 'B'.

All other study area intersections are expected to condition operating at an acceptable Level of Service (LOS 'D' or better) under Future (2028) Total Traffic conditions.

5.9.4 Intersection Design (MMLOS)

Analysis of conditions for each mode has been conducted based on the methodology prescribed in the City of Ottawa Multi-Modal Level of Service Guidelines. The Level of Service for each mode has been calculated for each intersection where signals exist or are anticipated.

The Future (2028) Total Traffic intersection MMLOS results have been summarized in **Table 20**. Detailed analysis results are provided **Appendix H**.

Table 20 - Intersection MMLOS - Future Conditions

LOCATION	LEVEL OF SERVICE BY MODE			
	PEDESTRIAN (PLOS)	BICYCLE (BLOS)	TRANSIT (TLOS)	TRUCK (TkLOS)
INTERSECTIONS				
Fallowfield Road & O'Keefe Court / Cobble Hill Drive	**E** (Target: C)	**F** (Target: C)	B (Target: D)	**F** (Target: E)

5.9.4.1 Summary of Potential Improvements

Based on the MMLOS results outlined in **Table 20** above, the following measures have been identified that could improve conditions for each travel mode:

Pedestrians

The PLOS at intersections is based on several factors including the number of traffic lanes that pedestrians must cross, corner radii, and whether the crossing allows for permissive or protective right or left turns, among others. The City of Ottawa minimum target for PLOS is 'C'.

The results of the analysis indicate that the intersection of Fallowfield Road & O'Keefe Court / Cobble Hill Drive is expected to experience a PLOS of 'E' primarily due to the level of traffic exposure pedestrians crossing the north/south approaches will experience in combination with the pedestrian delays. Providing enhanced pedestrian features such as a median, pedestrian leading interval, zebra stripe high-visibility crosswalk markings on the north and south approaches would reduce the level of pedestrian exposure on those crossings. The above features in combination with a reduced cycle length from the standard length of 120s to 70s would achieve a PLOS of 'C'. It should be noted, however, that a reduction in the cycle length may result in negative impacts to the vehicle level of service. Alternatively, design of the intersection as a 'protected intersection' will help attain the PLOS target.

Cyclists

The BLOS at intersections is dependent on several factors: the number of lanes that the cyclist is required to cross to make a left-turn; the presence of a dedicated right-turn lane on the approach; and the operating speed of each approach. The City target for BLOS is 'C'.

The results of the analysis indicate that cycling facilities at the Fallowfield Road & O'Keefe Court / Cobble Hill Drive intersection are not sufficient to achieve the BLOS target. Given the high operating speeds at this location, only the provision of physically separated cycling facilities with two-stage, left-turn bike boxes on all approaches will be sufficient to achieve the BLOS target. Alternatively, design of the intersection as a 'protected intersection' will help attain the BLOS target.

Transit

Intersection TLOS is based on the average signal delay experienced by transit vehicles at each intersection. The City Target TLOS is 'D'.

The results of the analysis indicate that the eastbound and westbound approaches are expected to experience average delays between 20 and 45 seconds during the weekday peak hours, however as there are no transit routes that utilize either approach, neither is factored into the TLOS calculation. Both the northbound and southbound approaches do currently serve as transit routes and are expected to experience minimal average delays of 10s or less, therefore the overall intersection TLOS is 'B' and well within the City's target.

Trucks

The Truck LOS (TkLOS) is based on the right-turn radii, as well as the number of receiving lanes for vehicles making a right-turn from the traffic lane being analyzed. The City of Ottawa target for TKLOS is 'E'.

Overall, the intersection TkLOS target is not attainable as a result of the tight right-turn radii to/from Cobble Hill Drive. Turning movement count data indicates that trucks infrequently utilize Cobble Hill, which is consistent with its classification as a local road and non-truck route. Given that its primary function is to provide access to adjacent residential subdivisions, the substandard right-turn radii is considered acceptable in this context. It should be noted that the right-turn radii to/from O'Keefe Court meets the TkLOS target, which is appropriate given that the Highway 416 Lands development is expected to generate regular truck traffic.

The recommended measures listed above are intended only as suggestions to the City on how the MMLOS within the study area could be improved and do not identify measures to be implemented as a direct consequence of this development. The remediation measures described above would improve mobility and comfort for cyclists but are not required to accommodate the proposed development.

5.10 Geometric Review

The following section provides a review of all geometric requirements for the study area intersections.

5.10.1 Sight Distance and Corner Clearances

The Lusk Street site access driveway is located on the outside of a horizontal curve which should afford this access favorable sightlines upstream and downstream of the intersection, while the Forager Street site access driveway is located on a short, straight segment with no significant horizontal or vertical curves. Despite its curvilinear alignment, the Lusk Street access allows for visibility in excess of the 85-metre distance required by TAC for road with a 60km/h design speed. Given that Forager Street is approximately 80m in length, vehicular are not expected to reach high operating speeds (i.e. 60 km/h) within such a short distance. Provided that vegetation is kept clear of the intersection sightlines, sight distances and corner clearances are not expected to be a concern for either of the proposed development's site access driveways.

5.10.2 Auxiliary Lane Analyses

Auxiliary turning lane requirements for all study area intersections are described as follows:

5.10.2.1 Auxiliary Left-Turn Lane Requirements (Unsignalized)

The intersection of O'Keefe Court & Lusk Street does not warrant a left-turn lane based on the advancing and opposing volumes projected at this intersection under Future (2028) Total Traffic conditions.

The future intersection configuration per the approved RMA will restrict the Fallowfield & Forager intersection to right-in/ right-out movements, therefore it was not necessary to assess left-turn lane requirements at this intersection.

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

5.10.2.2 Auxiliary Left-Turn Lane Requirements (Signalized)

A review of auxiliary left-turn lane storage requirements was completed at all signalized intersections within the study area under Future (2028) Total Traffic conditions. The review

compared the projected 95th percentile queue lengths from Synchro operational results, and the standard queue length calculation based on the following equation:

$$Storage\ Length = \frac{NL}{C} \times 1.5$$

Where:
N = number of vehicles per hour
L = Length occupied by a vehicle in the queue = 7 m
C = number of traffic signal cycles per hour

The results of the auxiliary left-turn lane analysis are summarized below in **Table 21** below.

Table 21 - Auxiliary Left-Turn Storage Analysis at Signalized Intersections

INTERSECTION	APPROACH	95TH %ILE QUEUE LENGTH (M)	CALCULATED QUEUE LENGTH (M)	EXISTING PARALLEL LENGTH (M)	STORAGE DEFICIENCY (M)
Fallowfield Road & O'Keefe Court / Cobble Hill Drive	NB	5	10	140	Existing Storage Adequate
	SB	5	0	60	Existing Storage Adequate
	EB	25	10	50	Existing Storage Adequate
	WB	30[1]	5	-	Existing Storage Adequate[2]

Notes: [1] Synchro queues were determined based on existing shared lane configuration
[2] Through volumes are nominal during weekday peak hours (i.e. less than 10 veh/h)

As per the results of the queue length analyses presented **Table 21** above, the existing parallel lanes have sufficient storage to accommodate the projected Future (2028) Total Traffic demand. No modifications to the existing auxiliary lanes are required within the timeframe of this study.

Synchro results indicate that with the existing shared through-left configuration, queue lengths during the weekday peak hours would be at most 16 and 27 metres on the eastbound and westbound approaches, respectively, under Future (2028) Total Traffic conditions. Queue lengths of this magnitude can be considered within an acceptable range for spillback on a through lane given the nominal through volumes of less than 10 vehicles per hour expected on these movements during the weekday peak hours.

5.10.2.3 Auxiliary Right-Turn Lane Requirements (Unsignalized)

The Transportation Association of Canada (TAC) suggests that auxiliary right-turn lanes be considered "when the volume of decelerating or accelerating vehicles compared with through vehicles causes undue hazard." Consideration for auxiliary right-turn lanes is typically given when the right-turning traffic exceeds 10% of the through volume and is at least 60 vehicles per hour.

The RMA for the Fallowfield/ Forager intersection has been designed with a parallel lane that includes sufficient deceleration length. No storage is required on this lane.

5.10.2.4 Auxiliary Right-Turn Lane Requirements (Signalized)

Similarly for signalized intersections, Section 9.14 of TAC suggests that auxiliary right-turn lanes shall be considered when more than 10% of vehicles on an approach are turning right and when the peak hour demand exceeds 60 vehicles. The purpose of this guideline is to mitigate operational impacts to through-traffic, particularly on high-speed arterial roadways such as Fallowfield Road, and may not be applicable in all circumstances.

The results of the auxiliary right-turn lane analysis are summarized in **Table 22** below:

Table 22 – Auxiliary Right-Turn Lane Storage Analysis at Signalized Intersections

INTERSECTION	APPROACH	RIGHT TURN VOLUME	APPROACH VEHICLES TURNING RIGHT (%)	95TH %ILE QUEUE LENGTH (M)	EXISTING PARALLEL LENGTH (M)	STORAGE DEFICIENCY (M)
Fallowfield Road & O'Keefe Court/ Cobble Hill Drive	NB	23	3%	<10	115	Existing Storage Adequate
	SB	88	9%	<10	25	Existing Storage Adequate
	EB	114	51%	20[1]	-	Existing Storage Adequate[2]
	WB	42	48%	30[1]	-	Existing Storage Adequate[2]

Notes: [1] Synchro queues were determined based on existing shared lane configuration
[2] Through volumes are nominal during weekday peak hours (i.e. less than 10 veh/h)

Although the eastbound and westbound approaches technically meet the criteria for a right-turn lane, the through volumes on these approaches were observed to be nominal (i.e. 10 vehicles or less) during the weekday peak hours. Synchro results indicate that with the existing shared through-right configuration, queue lengths during the weekday peak hours would be at most 16 and 27 metres on the eastbound and westbound approaches, respectively, under Future (2028) Total Traffic conditions. Queue lengths of this magnitude can be considered within an acceptable range for spillback on a through lane given the nominal through volumes expected. Further, the right-turn criteria is typically more applicable along high-speed arterial roads and is not considered appropriate in this context.

Based on the traffic volumes projections developed for this TIA, no additional right-turn facilities are required as a result of projected background or site-generated volumes at signalized study area intersections.

5.11 Summary of Improvements Indicated and Modification Options

As per the intersection capacity, Multi-Modal Level of Service and auxiliary lane analyses results presented above, off-site improvements to the adjacent road network have been recommended in order to accommodate the transportation demands of both background and site-generated traffic. The MMLOS results indicate existing deficiencies with respect user comfort and safety that could be considered for implementation by the City but are not required to safely accommodate the proposed development.

5.11.1 Fallowfield Road & O'Keefe Court/ Cobble Hill Drive

The intersection of Fallowfield & O'Keefe/ Cobble Hill is presently operating as a two-way stop-controlled intersection. The results of the analysis indicate that, by 2023, traffic signals will be operationally required under background traffic conditions, however traffic signals are not warranted within the timeframe of this study. As indicated in **Exhibit 4**, the proposed development is only expected to contribute nominal volumes at this intersection. With traffic signals in place, the intersection would be expected to operate at an acceptable level of service (i.e. LOS 'B') under Future (2028) Total Traffic conditions. If traffic signals are not implemented by the 2028 study horizon year, the results of the analysis indicate that long delays of approximately 4 to 5 minutes are expected at the Fallowfield & O'Keefe intersection with or without the inclusion of site-generated traffic. It is recommended that the City monitor this intersection on an annual basis to determine the appropriate timing for its signalization.

An analysis of auxiliary lane requirements found that auxiliary lane storage at this intersection is sufficient and can accommodate future travel demands within the context of this study.

Based on the MMLOS analysis, in order to meet the Pedestrian Level of Service and Bicycle Level of Service targets, various measures would need to be implemented. To attain the PLOS target, zebra stripe high-visibility crosswalk markings, a pedestrian leading interval and a median on the northbound/ southbound approaches are required in conjunction with a reduced cycle length to satisfy the Pedestrian Delay Evaluation. The implementation of bike lanes or higher-order cycling facilities on all approaches, along with two-stage, left-turn bike boxes are required to meet the BLOS targets. Alternatively, design of the intersection as a 'protected intersection' with fully-integrated pedestrian and cycling facilities will help attain the PLOS and BLOS targets. These features should be considered by the City upon signalization of this intersection but are not required to accommodate the proposed development.

5.11.2 O'Keefe Court & Lusk Street

O'Keefe Court & Lusk Street is a new three-legged intersection that is expected to operate at a high level of service (i.e. LOS 'A') beyond the horizon year of this study with stop control on Lusk Street and free-flow along O'Keefe Court.

Analysis indicated that left- or right-turn auxiliary lanes are not required on any of the intersection approaches within the timeframe of this study.

5.11.3 Fallowfield Road & Forager Street

Fallowfield Road & Forager Street is a new three-legged intersection with an approved RMA intended to restrict movements to right-in/right-out. With these turning restrictions in place, the intersection is anticipated to operate at LOS 'C' or better within the timeframe of this study.

6 Conclusion

The proposed restaurant and medical office development at 115 Lusk Street is expected to generate up to 13 and 32 two-way vehicular trips during the weekday morning and afternoon peak hours, respectively. These traffic volumes were distributed amongst two site access driveways, representing a marginal increase in traffic volumes with respect to the overall traffic projections expected within the 2028 study horizon year. The mode share targets were based on the South Nepean Traffic Assessment Zone (TAZ) and proportionally adjusted, in accordance with the Conditions of Approval for 4401 Fallowfield Road to yield an 85% auto/ 15% non-auto mode share split. It should also be noted that this study did not apply any pass-by reductions factors to the restaurant's trip generation, as it was determined that the overall impact on the adjacent road network would be minimal.

The intersection of Fallowfield & O'Keefe/ Cobble Hill is presently operating as a two-way stop controlled intersection. The results of the analysis indicate that, by 2023, traffic signals will be operationally required under background traffic conditions, however signals are not warranted within the timeframe of this study. With traffic signals in place, the intersection would be expected to operate at LOS 'B' beyond the study horizon year. If traffic signals are not implemented by the 2028 study horizon year, the results of the analysis indicate that long delays of approximately 4 to 5 minutes are expected at the Fallowfield & O'Keefe intersection with or without the inclusion of site-generated traffic. As site-generated traffic will not contribute significantly to any potential traffic operational issues at this intersection, it is recommended that the City continue monitoring this intersection on an annual basis to determine the appropriate timing for the introduction of traffic signals.

The results of the analysis indicate that the intersections of O'Keefe Court & Lusk Street and Fallowfield Road & Forager Street are expected to operate within acceptable standards (LOS 'D' or better) during the weekday morning and afternoon peak hours. Both are T-intersections that are configured with stop control on the minor road and do not warrant auxiliary lanes or future modifications to intersection control within the timeframe of this study.

A multi-modal analysis identifies deficiencies in the existing road network and potential remediation measures have been suggested in which the City could consider to meet these prescribed targets. It should be noted that, although these measures would improve for a range of transportation modes, they are not required to safely accommodate the transportation demands of the proposed development.

A Roadway Modification Application (RMA-2019-TPD-041B) was recently approved as a conditional requirement for the 4401 Fallowfield Road Subdivision. The RMA includes the right-in/right-out intersection at Fallowfield Road & Forager Street and a multi-use pathway along the west side of Fallowfield Road. As there is already an approved RMA intended to address the implementation of the above noted design elements and no off-site geometric improvements are required as a direct result of the proposed development, an RMA will not be included with the submission of this Transportation Impact Assessment.

All study area intersections were shown to operate well within the capacity constraints of the adjacent transportation network, with the appropriate modifications in place (i.e. signalization of Fallowfield & O'Keefe/ Cobble Hill by 2023). Further, the proposed development will contribute a negligible volume of traffic to the adjacent road network. A post-development Monitoring Plan is, therefore, not a requirement of this study.

Based on the findings of this study, it is the overall opinion of IBI Group that the proposed development will integrate well with and can be safely accommodated by the adjacent transportation network with the recommended actions and modifications in place.

Appendix A – City Circulation Comments

Step 1 & 2 Submission (Screening & Scoping) – Circulation Comments & Response

Report Submitted: October 29, 2019
Comments Received: November 1, 2019
Transportation Project Manager: Josiane Gervais

Module 2.3 - Exceptions Review

Table 4: Possible Exemptions

Module	Element	Exemption Considerations
4.5 Transportation Demand Management	**All elements**	• Not required for non-residential site plans expected to have fewer than 60 employees and/or students on location at any given time – **Please confirm how many employees are envisioned for the site**.

- **The exact number of employees envisioned for the site is not available yet. However, the ITE Parking Generation Manual (4th Edition) provides average employee densities for a variety of land uses. The average employee densities relevant to this site are as follows:**
  - **Office (ITE Land Use 701): 3.4 employees / 1000 ft^2**
  - **Quality Restaurant (ITE Land Use 931): 4.2 employees / 1000 ft^2**

  The medical office and restaurant will be 600 m^2 (6458 ft^2) and 300 m^2 (3229 ft^2), respectively, which, when multiplied by their respective employee densities, results in a total of 36 employees for both land uses combined. The Transportation Demand Management module is therefore exempt from the study.

Step 3 Submission (Forecasting) – Circulation Comments & Response

Report Submitted: December 31, 2019
Comments Received: January 17, 2020
Transportation Project Manager: Josiane Gervais

Transportation Engineering Services

- Consider increasing the walking mode share at ultimate build-out (while staying below the 15% non-auto mode outlined within the subdivision conditions). Once O'Keefe/Fallowfield is signalized, there may be a few more walking trips to the development.
  - **IBI Response: The mode share targets for 2023 and 2028 have been separated, with the 2028 analysis year adjusted to reflect a higher pedestrian mode share anticipated by this time. The 15% non-auto mode share target in 2028 will be stratified as follows: 2% transit, 0% cycling, 13% walking and 0% other mode share target. The mode share targets for 2023 have not been modified.**
- Provide the number of trips from the other developments in a table.
  - **IBI Response: A table has been added in Section 4.2.3 summarizing the number of trips generated by each adjacent development.**

Traffic Signal Operations

- No comments.

Development Review Transportation

- No comments.

Step 4 Submission (Analysis) – Circulation Comments & Response

Report Submitted: June 15, 2020 (Report Date April 9, 2020)
Comments Received: October 14, 2020
Transportation Project Manager: Josiane Gervais

Transportation Engineering Services

34. Section 5.3 - Boundary Streets & Site Plan: The sidewalk on Lusk Street should be shown on the site plan and should be depressed and continuous as per SC7.1.

    - **IBI Response: Acknowledged. The site plan in Exhibit 2 (Section 3.1.2) has been updated to show the sidewalk as depressed and continuous across the proposed site access driveway on Lusk Street, in accordance with SC7.1.**

35. Section 5.3.1 – Mobility: Assess MMLOS achievement at full build-out (after the completion of the RMA along Fallowfield Road).

    - **IBI Response: The segment-based MMLOS analysis results in Section 5.3.1 and Appendix H have been updated to show the improvements to the PLOS and BLOS associated with the planned implementation of the MUP on the west side of Fallowfield Road.**

Traffic Signal Operations

36. Based on the trip generation, this development will have little impact on surrounding roadways, however, we noted the existing volumes are incorrect. Volumes should reflect the peak hour counts. As well, please model Fallowfield/O'Keefe as stop control if it is planned to remain as such in the total volume files.

    - **IBI Response #1 (Existing Volumes): Figure 3 has been corrected.**
    - **IBI Response #2 (Intersection Control): Additional intersection capacity analyses have been undertaken to illustrate future operating conditions at the Fallowfield/ O'Keefe intersection, should it remain as a two-way stop-controlled intersection.**

Traffic Signal Design

37. No comments.

    - **IBI Response: Acknowledged.**

Street Lighting

38. Comments were not provided.

    - **IBI Response: Acknowledged.**

Transit Services

39. Section 3.2.3 Existing Transit Facilities and Service: while Route 179 does operate along Fallowfield Road adjacent to the development, it should be noted that it does not currently serve any stops on Fallowfield Road near the development. As such, there is currently no way to

access Route 179. Further, while Route 272 serves bus stops on Cobble Hill Drive at Fallowfield Road, it is a peak-period and peak-direction service; operating from Barrhaven to Downtown in the morning, and the reverse in the afternoon. Neither of these routes offers any practical transit service to the development. Please update this section to make this clear.

- **IBI Response: Acknowledged. Section 3.2.3 has been updated to more clearly identify the limited transit options available for the subject site.**

Development Review – Transportation

40. Ensure most recent Site Plan is included within TIA report.
    - **IBI Response: Acknowledged. Exhibit 2 has been updated to reflect the most recent site plan.**
41. Please address the above comments and proceed to submitting the Step 5: Final TIA (remove draft watermark, sign and include Certification Form).
    - **IBI Response: Acknowledged.**
42. The document control page should indicate Josiane Gervais as the Circulation List recipient.
    - **IBI Response: Acknowledged.**
43. Show all details of the roads abutting the site up to and including the opposite curb; include such items as pavement markings, accesses and/or sidewalks. The sidewalk on Lusk Street should be shown on the site plan and should be depressed and continuous as per SC7.1.
    - **IBI Response: Acknowledged. The site plan in Exhibit 2 has been updated accordingly.**
44. Prepare turning movement diagrams for the following:
    - all accesses showing the largest vehicle to access/egress the site; and
    - internal movements (loading areas, garbage).

    Consider reducing the curb radii at the site accesses if determined to be possible based upon turning movement diagrams.
    - **IBI Response: Vehicular swept-path analyses have been undertaken for delivery and waste collection vehicles and are included in Section 5.1.2.**
    - **As dimensioned on the site plan in Exhibit 2, the internal vehicular drive aisle will be 6.7m wide which is sufficient to accommodate a Fire Route and therefore access/circulation by delivery and waste collection vehicles will be easily accommodated.**
    - **The curb radii at both proposed site access driveways have been designed as being 6m.**

45. The City recommends development on private property be in accordance with the City's Accessibility Design Standards (see attached Site Plan Checklist, which summarizes AODA requirements). As the proposed site is commercial/institutional/industrial and for general public use, AODA legislation applies. Upon review of the site plan, the following comments are provided (see marked up site plan for locations of where these comments apply):
    - Sidewalks around both buildings must meet minimum AODA standards, i.e. a minimum width of 1.8m.
    - Depressed curbs and TWSIs where there is a change of level between the exterior path of travel and adjacent vehicular route.

    ➢ **IBI Response: Pedestrian routes from accessible parking spaces to primary building entrances are provided with curb depressions, tactile walking surface indicators (TWSIs) and 1.8m wide pathways, as shown on the site plan in Exhibit 2.**

Appendix B – Screening Form

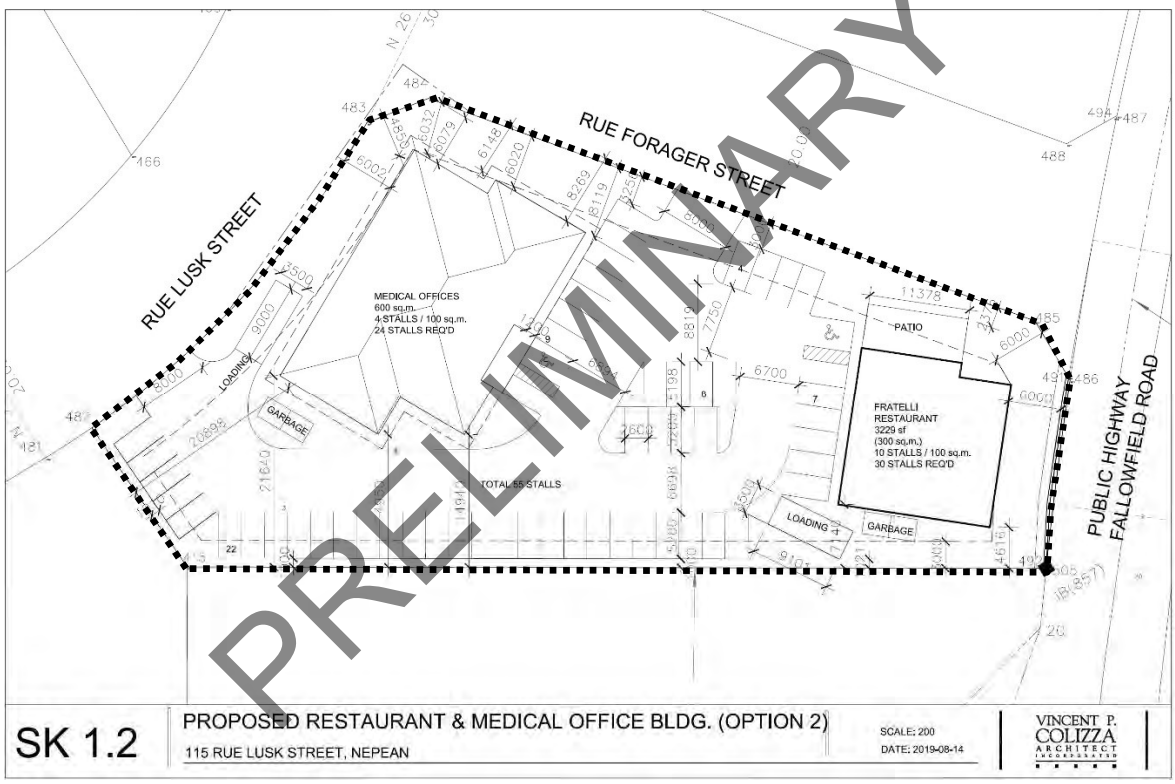
City of Ottawa 2017 TIA Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	115 Lusk Street
Description of Location	South Nepean – North of Strandherd Drive, West of Fallowfield Road and east of Highway 416 
Land Use Classification	Quality Restaurant and Medical Office
Development Size (units)	N/A
Development Size (m^2)	Quality Restaurant – 300 m^2 Medical Office – 600 m^2
Number of Accesses and Locations	One (1) access off of Lusk Street One (1) access off of Forager Street
Phase of Development	Single Phase
Buildout Year	2023 (Assumed)

If available, please attach a sketch of the development or site plan to this form.

Proposed Development:



2. Trip Generation Trigger

Considering the Development's Land Use type and Size (as filled out in the previous section), please refer to the Trip Generation Trigger checks below.

Land Use Type	Minimum Development Size
Single-family homes	40 units
Townhomes or apartments	90 units
Office	3,500 m^2
Industrial	5,000 m^2
Fast-food restaurant or coffee shop	100 m^2
Destination retail	1,000 m^2
Gas station or convenience market	75 m^2

** If the development has a land use type other than what is presented in the table above, estimates of person-trip generation may be made based on average trip generation characteristics represented in the current edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.*

Preliminary trip generation estimates were calculated based on average trip generation characteristics derived from the applicable land indicated in the Institute of Transportation Engineers (ITE) Trip Generation (10th Edition), the Quality Restaurant land use (931) and Medical-Dental Office Building land use (720). The 1.28 person-trip conversion factor recommended in the TIA Guidelines was applied to the base trip generation results to obtain the equivalent person-trip generation.

As indicated below, trip generation may slightly exceed the 60 person-trip threshold during the weekday afternoon peak hour, therefore the trip generation trigger is satisfied.

Baseline Vehicle Trips

				AM Peak Hour			PM Peak Hour		
ITE Land Use	Units	Size		In	Out	Total	In	Out	Total
720: Medical-Dental Office Bldg	ft2	6458.35	Equation:	*T=2.78*X*			*T=3.46*X*		
			% Distribution:	62%	38%	100%	39%	61%	100%
			Baseline Vehicle Trips:	11	7	18	9	14	22
931: Quality Restaurant	ft2	3229.17	Equation:	*T=0.73*X*			*T=7.80*X*		
			% Distribution:	50%	50%	100%	67%	33%	100%
			Baseline Vehicle Trips:	1	1	2	17	8	25
			Subtotal:	**12**	**8**	**20**	**26**	**22**	**48**

Note: Directional distribution is not provided for the Quality Restaurant for the weekday AM Peak Hour, therefore a 50/50 split has been assumed.

Person Trips

		AM Peak Hour			PM Peak Hour		
ITE Land Use		In	Out	Total	In	Out	Total
720: Medical-Dental Office Bldg	Conversion Factor	1.28			1.28		
		14	9	23	11	17	29
931: Quality Restaurant	Conversion Factor	1.28			1.28		
		2	2	3	22	11	32
	Subtotal:	**16**	**10**	**26**	**33**	**28**	**61**

➢ **Based on the results above, the Trip Generation Trigger is satisfied.**

3. Location Triggers

	Yes	No
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks?		✓
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?*		✓

**DPA and TOD are identified in the City of Ottawa Official Plan (DPA in Section 2.5.1 and Schedules A and B; TOD in Annex 6). See Chapter 4 for a list of City of Ottawa Planning and Engineering documents that support the completion of TIA).*

- **Based on the results above, the Location Trigger is NOT satisfied.**

4. Safety Triggers

	Yes	No
Are posted speed limits on a boundary street are 80 km/hr or greater?		✓
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?		✓
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?		✓
Is the proposed driveway within auxiliary lanes of an intersection?		✓
Does the proposed driveway make use of an existing median break that serves an existing site?		✓
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?		✓
Does the development include a drive-thru facility?		✓

- **Based on the results above, the Safety Trigger is NOT satisfied.**

5. Summary

	Yes	No
Does the development satisfy the Trip Generation Trigger?	✓	
Does the development satisfy the Location Trigger?		✓
Does the development satisfy the Safety Trigger?		✓

CONCLUSION: The Trip Generation Trigger is satisfied, therefore a TIA is required.

Appendix C – Traffic Data

Survey Date: Tuesday January 30 2018

Weather: Sunny

NB (South Leg) Street Name: Fallowfield Road

SB (North Leg) Street Name: Fallowfield Road

EB (West Leg) Street Name: O'Keefe Court

WB (East Leg) Street Name: O'Keefe Court

Start Time (AM Peak): 7:00

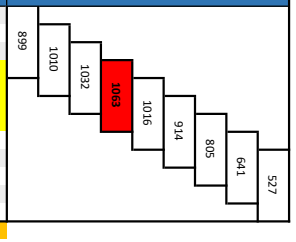
End Time (AM Peak): 10:00

The AM Peak Hour is from 7:45 AM to 8:45 AM

AADT Factor: 1.1

Turning Movement Count - 15 Minute Vehicle Summary Report (AM Peak)

Time Period	Fallowfield Road Northbound					Fallowfield Road Southbound					N/S STREET TOTAL	O'Keefe Court Eastbound					O'Keefe Court Westbound					E/W STREET TOTAL	Grand TOTAL
	LT	ST	RT	U-Turns	NB TOTAL	LT	ST	RT	U-Turns	SB TOTAL		LT	ST	RT	U-Turns	EB TOTAL	LT	ST	RT	U-Turns	WB TOTAL		
7:00 7:15	0	86	1	0	**87**	3	54	1	0	**58**	**145**	0	1	1	0	**2**	7	3	7	0	**17**	**19**	**164**
7:15 7:30	0	135	2	0	**137**	2	70	2	1	**75**	**212**	0	3	4	0	**7**	10	1	15	0	**26**	**33**	**245**
7:30 7:45	2	142	3	0	**147**	0	82	0	0	**82**	**229**	4	1	2	0	**7**	7	0	9	0	**16**	**23**	**252**
7:45 8:00	1	125	6	0	**132**	4	82	0	0	**86**	**218**	0	0	1	0	**1**	9	3	7	0	**19**	**20**	**238**
8:00 8:15	1	127	1	0	**129**	1	111	1	0	**113**	**242**	0	5	3	0	**8**	7	3	15	0	**25**	**33**	**275**
8:15 8:30	2	113	1	0	**116**	0	120	2	0	**122**	**238**	1	1	3	0	**5**	12	0	12	0	**24**	**29**	**267**
8:30 8:45	1	121	1	0	**123**	3	132	2	0	**137**	**260**	1	0	2	0	**3**	11	1	8	0	**20**	**23**	**283**
8:45 9:00	0	76	2	0	**78**	2	88	1	0	**91**	**169**	2	0	5	0	**7**	9	1	5	0	**15**	**22**	**191**
9:00 9:15	1	73	1	0	**75**	4	70	0	0	**74**	**149**	1	0	3	0	**4**	6	1	13	0	**20**	**24**	**173**
9:15 9:30	4	58	3	0	**65**	2	71	2	0	**75**	**140**	1	1	4	0	**6**	4	3	5	0	**12**	**18**	**158**
9:30 9:45	1	32	1	0	**34**	1	70	2	0	**73**	**107**	1	1	3	0	**5**	3	3	1	0	**7**	**12**	**119**
9:45 10:00	1	33	4	0	**38**	0	32	0	0	**32**	**70**	0	1	1	0	**2**	3	1	1	0	**5**	**7**	**77**
Total AM Peak Hr	**5**	**486**	**9**	**0**	**500**	**8**	**445**	**5**	**0**	**458**	**958**	**2**	**6**	**9**	**0**	**17**	**39**	**7**	**42**	**0**	**88**	**105**	**1063**
TOTAL:	14	1121	26	0	**1161**	22	982	13	1	**1018**	**2179**	11	14	32	0	**57**	88	20	98	0	**206**	**263**	**2442**



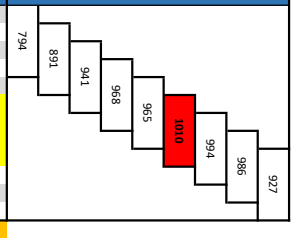
Start Time (PM Peak): 15:00

End Time (PM Peak): 18:00

The PM Peak Hour is from 4:15 PM to 5:15 PM

Turning Movement Count - 15 Minute Vehicle Summary Report (PM Peak)

Time Period	Fallowfield Road Northbound					Fallowfield Road Southbound					N/S STR TOTAL	O'Keefe Court Eastbound					O'Keefe Court Westbound					E/W STR TOTAL	Grand TOTAL
	LT	ST	RT	U-Turns	NB TOTAL	LT	ST	RT	U-Turns	SB TOTAL		LT	ST	RT	U-Turns	EB TOTAL	LT	ST	RT	U-Turns	WB TOTAL		
15:00 15:15	0	28	0	0	**28**	2	82	3	0	**87**	**115**	1	0	1	0	**2**	2	0	5	0	**7**	**9**	**124**
15:15 15:30	3	61	1	0	**65**	2	140	0	0	**142**	**207**	0	1	4	0	**5**	3	0	3	0	**6**	**11**	**218**
15:30 15:45	3	76	1	0	**80**	6	132	3	0	**141**	**221**	1	0	2	0	**3**	6	1	6	0	**13**	**16**	**237**
15:45 16:00	2	76	5	0	**83**	5	107	3	0	**115**	**198**	1	2	2	0	**5**	2	1	9	0	**12**	**17**	**215**
16:00 16:15	3	60	2	0	**65**	4	137	1	0	**142**	**207**	1	1	4	0	**6**	1	1	6	0	**8**	**14**	**221**
16:15 16:30	4	82	5	0	**91**	1	162	2	0	**165**	**256**	3	0	2	0	**5**	3	0	4	0	**7**	**12**	**268**
16:30 16:45	1	85	7	0	**93**	10	144	0	0	**154**	**247**	1	1	4	0	**6**	3	0	8	0	**11**	**17**	**264**
16:45 17:00	0	69	7	0	**76**	1	121	3	0	**125**	**201**	1	0	2	1	**4**	3	1	3	0	**7**	**11**	**212**
17:00 17:15	7	94	4	5	**110**	5	140	0	0	**145**	**255**	0	1	5	0	**6**	0	0	5	0	**5**	**11**	**266**
17:15 17:30	3	87	5	0	**95**	12	131	3	0	**146**	**241**	3	1	2	0	**6**	1	0	4	0	**5**	**11**	**252**
17:30 17:45	2	79	5	0	**86**	7	140	2	0	**149**	**235**	1	0	5	0	**6**	8	0	7	0	**15**	**21**	**256**
17:45 18:00	1	38	2	0	**41**	7	95	1	0	**103**	**144**	2	1	1	0	**4**	1	0	4	0	**5**	**9**	**153**
Total PM Pk Hour	**12**	**330**	**23**	**5**	**370**	**17**	**567**	**5**	**0**	**589**	**959**	**5**	**2**	**13**	**1**	**21**	**9**	**1**	**20**	**0**	**30**	**51**	**1010**
TOTAL:	29	835	44	5	**913**	62	1531	21	0	**1614**	**2527**	15	8	34	1	**58**	33	4	64	0	**101**	**159**	**2686**



Survey Date: Tuesday January 30 2018
Weather: Sunny

NB (South Leg) Street Name: Fallowfield Road
SB (North Leg) Street Name: Fallowfield Road

EB (West Leg) Street Name: O'Keefe Court
WB (East Leg) Street Name: O'Keefe Court

Start Time (AM Peak): 7:00
End Time (AM Peak): 10:00

Turning Movement Count - 15 Minute Pedestrian Volume Report (AM Peak)

Time Period	Fallowfield Road	Fallowfield Road	N/S STREET TOTAL	O'Keefe Court	O'Keefe Court	E/W STREET TOTAL	Grand TOTAL
	NB Approach (East or West Crossing)	SB Approach (East or West Crossing)		EB Approach (North or South Crossing)	WB Approach (North or South Crossing)		
7:00 7:15	0	0	**0**	0	0	**0**	**0**
7:15 7:30	0	0	**0**	0	0	**0**	**0**
7:30 7:45	0	0	**0**	0	1	**1**	**1**
7:45 8:00	0	0	**0**	0	0	**0**	**0**
8:00 8:15	0	0	**0**	0	0	**0**	**0**
8:15 8:30	0	0	**0**	0	0	**0**	**0**
8:30 8:45	0	0	**0**	0	0	**0**	**0**
8:45 9:00	0	0	**0**	0	0	**0**	**0**
9:00 9:15	0	0	**0**	0	0	**0**	**0**
9:15 9:30	1	0	**1**	0	0	**0**	**1**
9:30 9:45	0	0	**0**	1	0	**1**	**1**
9:45 10:00	0	0	**0**	0	0	**0**	**0**
TOTAL:	1	0	**1**	1	1	**2**	**3**

Start Time (PM Peak): 15:00
End Time (PM Peak): 18:00

Turning Movement Count - 15 Minute Pedestrian Volume Report (PM Peak)

Time Period	Fallowfield Road	Fallowfield Road	N/S STREET TOTAL	O'Keefe Court	O'Keefe Court	E/W STREET TOTAL	Grand TOTAL
	NB Approach (East or West Crossing)	SB Approach (East or West Crossing)		EB Approach (North or South Crossing)	WB Approach (North or South Crossing)		
15:00 15:15	0	2	**2**	0	0	**0**	**2**
15:15 15:30	0	0	**0**	0	0	**0**	**0**
15:30 15:45	0	0	**0**	0	0	**0**	**0**
15:45 16:00	0	0	**0**	0	0	**0**	**0**
16:00 16:15	0	0	**0**	0	0	**0**	**0**
16:15 16:30	0	0	**0**	0	0	**0**	**0**
16:30 16:45	0	0	**0**	0	0	**0**	**0**
16:45 17:00	0	0	**0**	0	0	**0**	**0**
17:00 17:15	0	0	**0**	0	0	**0**	**0**
17:15 17:30	0	0	**0**	0	0	**0**	**0**
17:30 17:45	0	0	**0**	0	0	**0**	**0**
17:45 18:00	0	0	**0**	0	0	**0**	**0**
TOTAL:	0	2	**2**	0	0	**0**	**2**

Survey Date: Tuesday January 30 2018

Weather: Sunny

NB (South Leg) Street Name: Fallowfield Road

SB (North Leg) Street Name: Fallowfield Road

O'Keefe Court

O'Keefe Court

Start Time (AM Peak): 7:00

End Time (AM Peak): 10:00

Turning Movement Count - 15 Minute Cyclist Volume Report (AM Peak)

Time Period	Fallowfield Road Northbound	Fallowfield Road Southbound	N/S STREET Total	O'Keefe Court Eastbound	O'Keefe Court Westbound	E/W STREET TOTAL	Grand TOTAL
7:00 7:15	0	0	**0**	0	0	**0**	**0**
7:15 7:30	0	0	**0**	0	0	**0**	**0**
7:30 7:45	0	0	**0**	0	0	**0**	**0**
7:45 8:00	0	0	**0**	0	0	**0**	**0**
8:00 8:15	0	0	**0**	0	0	**0**	**0**
8:15 8:30	0	0	**0**	0	0	**0**	**0**
8:30 8:45	0	0	**0**	0	0	**0**	**0**
8:45 9:00	0	0	**0**	0	0	**0**	**0**
9:00 9:15	0	0	**0**	0	0	**0**	**0**
9:15 9:30	0	0	**0**	0	0	**0**	**0**
9:30 9:45	0	0	**0**	0	0	**0**	**0**
9:45 10:00	0	0	**0**	0	0	**0**	**0**
TOTAL:	0	0	**0**	0	0	**0**	**0**

Start Time (PM Peak): 15:00

End Time (PM Peak): 18:00

Turning Movement Count - 15 Minute Cyclist Volume Report (PM Peak)

Time Period	Fallowfield Road Northbound	Fallowfield Road Southbound	N/S STREET Total	O'Keefe Court Eastbound	O'Keefe Court Westbound	E/W STREET TOTAL	Grand TOTAL
15:00 15:15	0	0	**0**	0	0	**0**	**0**
15:15 15:30	0	0	**0**	0	0	**0**	**0**
15:30 15:45	0	0	**0**	0	0	**0**	**0**
15:45 16:00	0	0	**0**	0	0	**0**	**0**
16:00 16:15	0	0	**0**	0	0	**0**	**0**
16:15 16:30	0	0	**0**	0	0	**0**	**0**
16:30 16:45	0	0	**0**	0	0	**0**	**0**
16:45 17:00	0	0	**0**	0	0	**0**	**0**
17:00 17:15	0	0	**0**	0	0	**0**	**0**
17:15 17:30	0	0	**0**	0	0	**0**	**0**
17:30 17:45	0	0	**0**	0	0	**0**	**0**
17:45 18:00	0	0	**0**	0	0	**0**	**0**
TOTAL:	0	0	**0**	0	0	**0**	**0**

Survey Date: Tuesday January 30 2018
Weather: Sunny

NB (South Leg) Street Name: Fallowfield Road
SB (North Leg) Street Name: Fallowfield Road

EB (West Leg) Street Name: O'Keefe Court
WB (East Leg) Street Name: O'Keefe Court

Start Time (AM Peak): 7:00
End Time (AM Peak): 10:00

Turning Movement Count - 15 Minute Heavy Vehicle Report (AM Peak)

Time Period	Fallowfield Road Northbound					Fallowfield Road Southbound					N/S STREET Total	O'Keefe Court Eastbound					O'Keefe Court Westbound					E/W STREET TOTAL	Grand TOTAL
	LT	ST	RT	U-Turns	NB TOTAL	LT	ST	RT	U-Turns	SB TOTAL		LT	ST	RT	U-Turns	EB TOTAL	LT	ST	RT	U-Turns	WB TOTAL		
7:00 7:15	1	2	0	0	**3**	0	2	0	0	**2**	**5**	0	1	0	0	**1**	0	0	0	0	**0**	**1**	**6**
7:15 7:30	0	2	0	0	**2**	0	4	0	0	**4**	**6**	0	0	0	0	**0**	0	0	1	0	**1**	**1**	**7**
7:30 7:45	0	7	0	0	**7**	0	11	0	0	**11**	**18**	0	0	0	0	**0**	0	0	0	0	**0**	**0**	**18**
7:45 8:00	0	7	0	0	**7**	0	3	0	0	**3**	**10**	0	0	0	0	**0**	0	0	0	0	**0**	**0**	**10**
8:00 8:15	0	3	2	0	**5**	0	4	0	0	**4**	**9**	0	0	1	0	**1**	0	0	0	0	**0**	**1**	**10**
8:15 8:30	0	11	3	0	**14**	0	7	0	0	**7**	**21**	0	0	0	0	**0**	1	0	0	0	**1**	**1**	**22**
8:30 8:45	0	3	0	0	**3**	1	3	0	0	**4**	**7**	0	0	0	0	**0**	0	1	0	0	**1**	**1**	**8**
8:45 9:00	0	6	0	0	**6**	0	4	0	0	**4**	**10**	0	0	0	0	**0**	0	0	0	0	**0**	**0**	**10**
9:00 9:15	0	4	0	0	**4**	0	20	0	0	**20**	**24**	0	0	0	0	**0**	0	0	1	0	**1**	**1**	**25**
9:15 9:30	0	4	1	0	**5**	0	7	0	0	**7**	**12**	0	0	0	0	**0**	0	1	0	0	**1**	**1**	**13**
9:30 9:45	0	3	0	0	**3**	0	8	0	0	**8**	**11**	0	0	1	0	**1**	1	0	0	0	**1**	**2**	**13**
9:45 10:00	0	1	0	0	**1**	0	1	0	0	**1**	**2**	0	0	0	0	**0**	0	0	0	0	**0**	**0**	**2**
TOTAL:	1	53	6	0	**60**	1	74	0	0	**75**	**135**	0	1	2	0	**3**	2	2	2	0	**6**	**9**	**144**

Start Time (PM Peak): 15:00
End Time (PM Peak): 18:00

Turning Movement Count - 15 Minute Heavy Vehicle Report (PM Peak)

Time Period	Fallowfield Road Northbound					Fallowfield Road Southbound					N/S STREET TOTAL	O'Keefe Court Eastbound					O'Keefe Court Westbound					E/W STREET TOTAL	Grand TOTAL
	LT	ST	RT	U-Turns	NB TOTAL	LT	ST	RT	U-Turns	SB TOTAL		LT	ST	RT	U-Turns	EB TOTAL	LT	ST	RT	U-Turns	WB TOTAL		
15:00 15:15	0	1	1	0	**2**	0	6	0	0	**6**	**8**	0	0	0	0	**0**	0	0	1	0	**1**	**1**	**9**
15:15 15:30	0	6	0	0	**6**	0	5	0	0	**5**	**11**	0	0	0	0	**0**	0	1	2	0	**3**	**3**	**14**
15:30 15:45	0	10	0	0	**10**	0	5	0	0	**5**	**15**	0	0	0	0	**0**	0	0	1	0	**1**	**1**	**16**
15:45 16:00	0	5	0	0	**5**	0	3	0	0	**3**	**8**	0	0	0	0	**0**	0	0	1	0	**1**	**1**	**9**
16:00 16:15	0	1	1	0	**2**	0	3	0	0	**3**	**5**	0	0	0	0	**0**	0	0	0	0	**0**	**0**	**5**
16:15 16:30	0	3	0	0	**3**	0	4	0	0	**4**	**7**	0	0	0	0	**0**	0	0	0	0	**0**	**0**	**7**
16:30 16:45	0	3	0	0	**3**	0	9	0	0	**9**	**12**	0	0	0	0	**0**	0	0	0	0	**0**	**0**	**12**
16:45 17:00	0	3	0	0	**3**	1	6	0	0	**7**	**10**	0	0	0	0	**0**	0	0	0	0	**0**	**0**	**10**
17:00 17:15	0	3	0	0	**3**	0	4	0	0	**4**	**7**	0	0	0	0	**0**	0	0	0	0	**0**	**0**	**7**
17:15 17:30	0	1	0	0	**1**	0	3	0	0	**3**	**4**	0	0	0	0	**0**	1	0	1	0	**2**	**2**	**6**
17:30 17:45	0	2	0	0	**2**	0	4	0	0	**4**	**6**	0	0	0	0	**0**	0	0	0	0	**0**	**0**	**6**
17:45 18:00	0	0	0	0	**0**	0	2	0	0	**2**	**2**	0	0	0	0	**0**	0	0	0	0	**0**	**0**	**2**
TOTAL:	0	38	2	0	**40**	1	54	0	0	**55**	**95**	0	0	0	0	**0**	1	1	6	0	**8**	**8**	**103**

Appendix D – OC Transpo Routes

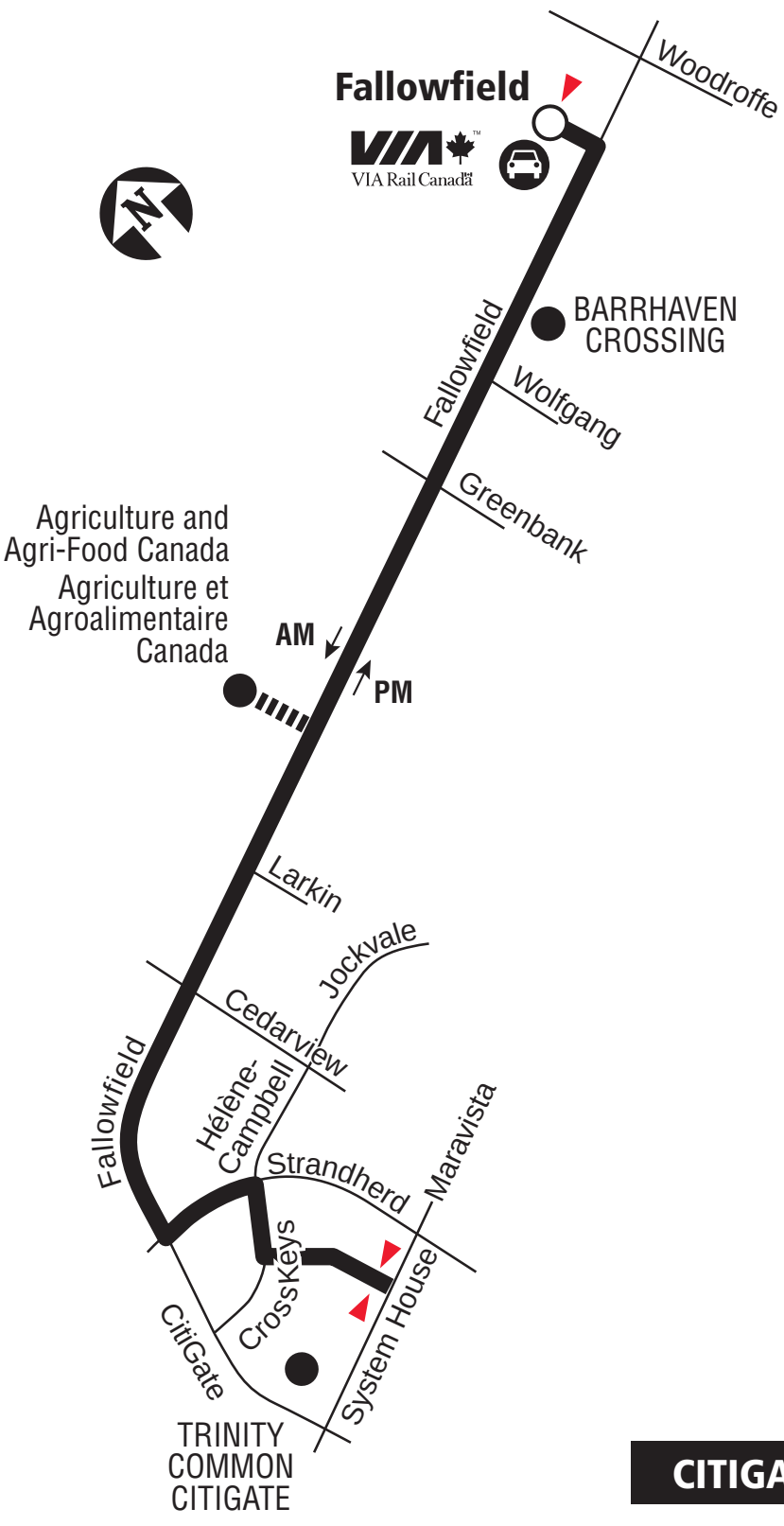
179

Local

FALLOWFIELD
CITIGATE

Monday to Friday / Lundi au vendredi
Peak periods only
Périodes de pointe seulement

FALLOWFIELD



CITIGATE

○	Transitway & Station
▮▮▮▮▮▮▮▮▮▮	Some trips / Quelques trajets
P	Park & Ride / Parc-o-bus
▲	Timepoint / Heures de passage

2019.06

Schedule / Horaire.....613-560-1000
Text / Texto 560560
plus your four digit bus stop number / *plus* votre numéro d'arrêt à quatre chiffres

Customer Service
Service à la clientèle **613-842-3600**
Lost and Found / Objets perdus..... **613-563-4011**
Security / Sécurité **613-741-2478**

Effective June 25, 2017
En vigueur 25 juin 2017

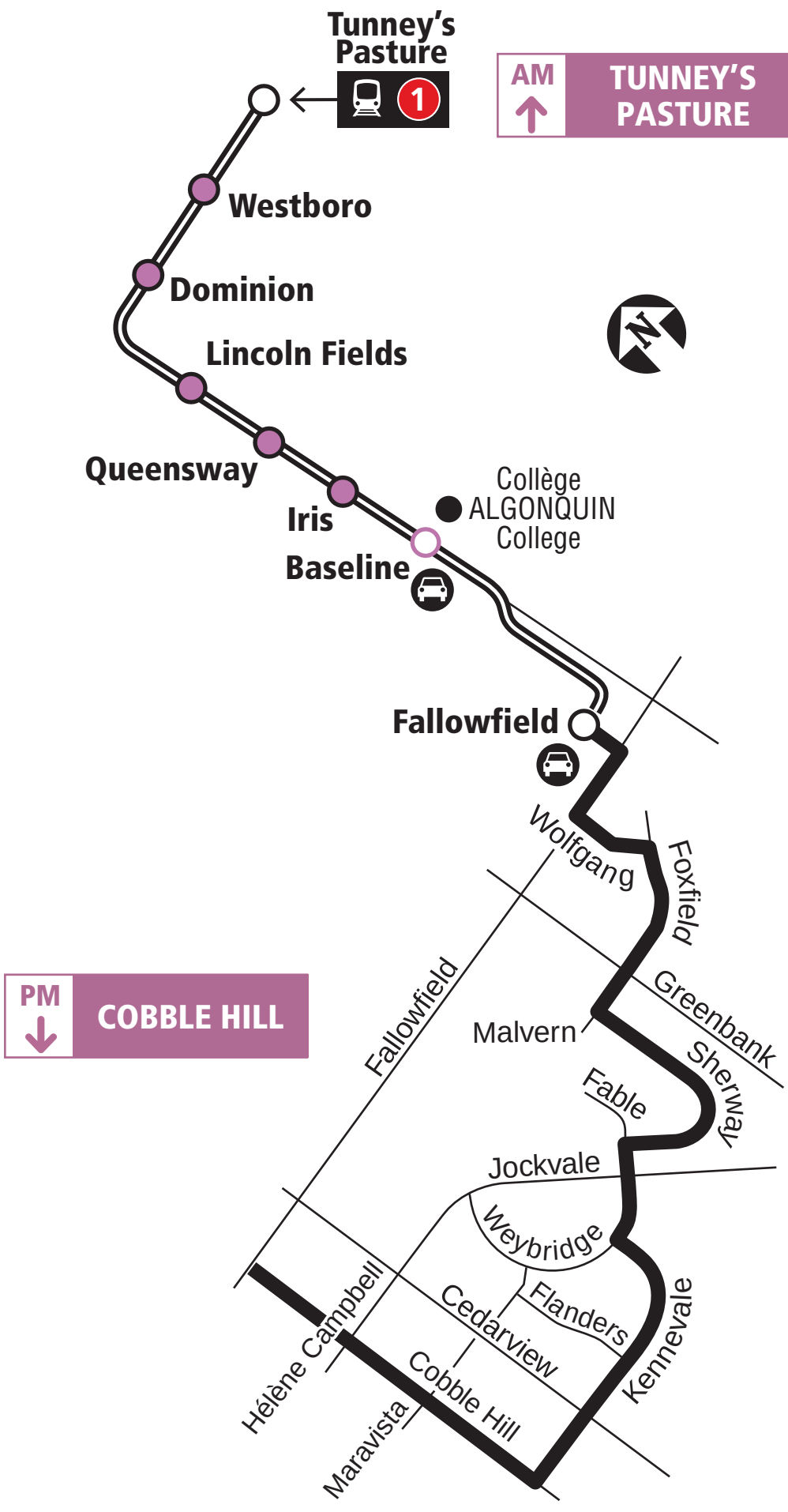
OC Transpo
INFO 613-741-4390
octranspo.com

272 Connexion

COBBLE HILL
TUNNEY'S PASTURE

Monday to Friday / Lundi au vendredi

Peak periods only
Périodes de pointe seulement



Transitway & Station

Limited stops: Off only in AM / No stop in PM
Arrêts limités : Débarquement en AM seul. / Aucun arrêt en PM

AM: Off only - PM: Full Service
AM: Débarquement seul. - PM: Service complet

Park & Ride / Parc-o-bus

2019.07

1

Future route after O-Train Line 1 is open
Trajet du circuit après l'ouverture de la Ligne 1 de l'O-Train

Lost and Found / Objets perdus..... **613-563-4011**
Security / Sécurité..... **613-741-2478**

OC Transpo

INFO 613-741-4390
octranspo.com

Appendix E – Collision Data

City Operations - Transportation Services

Collision Details Report - Public Version

From: January 1, 2014 **To:** December 31, 2018

Location: CEDARVIEW RD @ FALLOWFIELD RD

Traffic Control: Traffic signal **Total Collisions:** 29

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Aug-16, Thu,08:29	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2018-Jul-30, Mon,13:56	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Passenger van	Other motor vehicle	
2018-Jul-09, Mon,11:21	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jun-22, Fri,08:35	Clear	Turning movement	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Jun-14, Thu,08:35	Rain	Rear end	P.D. only	Wet	East	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2018-May-22, Tue,08:18	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	

					North	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Jan-22, Mon,18:13	Snow	Turning movement	P.D. only	Loose snow	East	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Turning left	Automobile, station wagon	Other motor vehicle
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2017-Dec-18, Mon,22:05	Snow	Sideswipe	Non-fatal injury	Loose snow	South	Changing lanes	Unknown	Other motor vehicle
					South	Going ahead	Passenger van	Other motor vehicle
2017-Nov-04, Sat,11:29	Clear	Turning movement	P.D. only	Dry	North	Turning left	Pick-up truck	Other motor vehicle
					South	Turning right	Automobile, station wagon	Other motor vehicle
2017-Nov-02, Thu,16:27	Rain	Rear end	P.D. only	Wet	West	Slowing or stopping	Automobile, station wagon	Skidding/sliding
					West	Stopped	Automobile, station wagon	Other motor vehicle
2017-Mar-21, Tue,17:18	Clear	Rear end	P.D. only	Wet	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
2017-Feb-15, Wed,18:11	Snow	Angle	P.D. only	Loose snow	South	Turning left	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Snow plow	Other motor vehicle

2017-Jan-27, Fri,16:46	Snow	Turning movement	Non-fatal injury	Wet	East	Turning left	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Jun-27, Mon,14:50	Clear	Angle	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle
					South	Unknown	Unknown	Other motor vehicle
2016-Feb-25, Thu,18:49	Snow	Rear end	Non-fatal injury	Slush	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2016-Feb-22, Mon,13:47	Clear	Sideswipe	Non-fatal injury	Dry	North	Changing lanes	Passenger van	Other motor vehicle
					North	Turning left	Automobile, station wagon	Other motor vehicle
2016-Jan-11, Mon,17:30	Clear	Other	P.D. only	Wet	North	Reversing	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2016-Jan-06, Wed,07:26	Clear	Turning movement	P.D. only	Dry	South	Turning left	Passenger van	Other motor vehicle
					North	Going ahead	Pick-up truck	Other motor vehicle
2015-Oct-31, Sat,01:40	Clear	Turning movement	P.D. only	Dry	South	Turning left	Passenger van	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle

2015-Jul-01, Wed,07:35	Rain	Angle	P.D. only	Wet	North	Turning left	Truck and trailer	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Jun-23, Tue,08:00	Clear	Rear end	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle
					West	Turning right	Pick-up truck	Other motor vehicle
2015-Apr-12, Sun,13:48	Clear	Sideswipe	Non-fatal injury	Dry	South	Turning left	Automobile, station wagon	Cyclist
					South	Turning left	Bicycle	Other motor vehicle
2014-Oct-22, Wed,14:00	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Oct-11, Sat,22:48	Clear	Turning movement	P.D. only	Wet	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Oct-05, Sun,17:28	Clear	Angle	P.D. only	Dry	South	Going ahead	Passenger van	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Aug-04, Mon,11:48	Clear	Angle	Non-fatal injury	Dry	West	Going ahead	Pick-up truck	Other motor vehicle
					North	Going ahead	Pick-up truck	Other motor vehicle

2014-Aug-02, Sat,13:04	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2014-Apr-04, Fri,07:39	Clear	Angle	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Passenger van	Other motor vehicle	
2014-Feb-11, Tue,17:00	Clear	Sideswipe	P.D. only	Dry	West	Overtaking	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	

Location: FALLOWFIELD RD @ O'KEEFE CRT

Traffic Control: Stop sign

Total Collisions: 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Sep-28, Mon,07:47	Clear	Angle	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Pick-up truck	Other motor vehicle	

Location: FALLOWFIELD RD @ STRANDHERD DR

Traffic Control: Traffic signal

Total Collisions: 35

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Dec-22, Sat,08:04	Snow	Turning movement	P.D. only	Loose snow	West	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Oct-24, Wed,08:45	Clear	Rear end	Non-fatal injury	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	

					West	Stopped	Automobile, station wagon	Other motor vehicle
2018-Sep-17, Mon,14:10	Clear	Rear end	P.D. only	Dry	South	Turning right	Pick-up truck	Other motor vehicle
					South	Turning right	Automobile, station wagon	Other motor vehicle
2018-Sep-10, Mon,07:45	Clear	Sideswipe	P.D. only	Dry	West	Unknown	Unknown	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Aug-16, Thu,12:28	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2018-Jun-24, Sun,14:01	Clear	Rear end	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle
					South	Turning right	Automobile, station wagon	Other motor vehicle
2018-Jun-19, Tue,21:05	Clear	Angle	Non-fatal injury	Dry	South	Going ahead	Motorcycle	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Apr-26, Thu,16:11	Clear	Rear end	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle
					South	Turning right	Passenger van	Other motor vehicle
2018-Mar-09, Fri,10:55	Snow	Angle	Non-fatal injury	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle

					South	Turning left	Pick-up truck	Other motor vehicle
2018-Feb-16, Fri,15:35	Clear	Rear end	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle
					East	Turning left	Automobile, station wagon	Other motor vehicle
2018-Feb-09, Fri,17:45	Clear	Rear end	Non-fatal injury	Wet	West	Slowing or stopping	Automobile, station wagon	Skidding/sliding
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2018-Feb-08, Thu,15:46	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Pick-up truck	Other motor vehicle
2018-Jan-08, Mon,12:55	Snow	Rear end	Non-fatal injury	Slush	East	Slowing or stopping	Pick-up truck	Skidding/sliding
					East	Stopped	Automobile, station wagon	Other motor vehicle
2017-Nov-17, Fri,12:02	Clear	Rear end	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle
					West	Stopped	Passenger van	Other motor vehicle
2017-Oct-17, Tue,17:28	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2017-Sep-20, Wed,20:10	Clear	Rear end	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle

					West	Turning right	Automobile, station wagon	Other motor vehicle
2017-Aug-15, Tue,14:45	Clear	Angle	Non-fatal injury	Dry	East	Going ahead	Passenger van	Other motor vehicle
					North	Turning left	Pick-up truck	Other motor vehicle
2017-Aug-12, Sat,18:56	Rain	Rear end	Non-fatal injury	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2017-Jul-26, Wed,07:34	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Jul-14, Fri,18:11	Clear	Rear end	P.D. only	Dry	South	Turning right	Pick-up truck	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
					South	Merging	Automobile, station wagon	Other motor vehicle
2017-Jun-05, Mon,14:45	Clear	Rear end	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle
					South	Turning right	Automobile, station wagon	Other motor vehicle
					South	Turning right	Automobile, station wagon	Other motor vehicle
2017-Apr-20, Thu,08:40	Clear	Rear end	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle
					East	Turning left	Pick-up truck	Other motor vehicle

2017-Feb-26, Sun,14:09	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle
					West	Changing lanes	Pick-up truck	Other motor vehicle
2017-Jan-12, Thu,06:25	Rain	Approaching	P.D. only	Wet	West	Unknown	Unknown	Other motor vehicle
					East	Going ahead	Pick-up truck	Other motor vehicle
2016-Jun-18, Sat,13:50	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2016-Feb-20, Sat,03:57	Rain	Rear end	P.D. only	Slush	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2016-Jan-19, Tue,06:27	Clear	Rear end	P.D. only	Ice	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2016-Jan-13, Wed,15:11	Clear	Sideswipe	P.D. only	Wet	West	Changing lanes	Pick-up truck	Other motor vehicle
					West	Going ahead	Pick-up truck	Other motor vehicle
2015-Aug-14, Fri,16:39	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle

2015-Jul-22, Wed,20:20	Clear	Rear end	P.D. only	Dry	East	Turning left	Pick-up truck	Other motor vehicle	
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2015-Feb-24, Tue,12:48	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Oct-20, Mon,08:45	Clear	SMV other	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Pedestrian	1
2014-Aug-29, Fri,08:56	Clear	Rear end	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle	
					South	Turning right	Pick-up truck	Other motor vehicle	
2014-Jun-08, Sun,04:47	Clear	SMV other	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Curb	
2014-Mar-26, Wed,17:53	Clear	Rear end	Non-fatal injury	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	
					East	Stopped	Pick-up truck	Other motor vehicle	
					East	Stopped	Pick-up truck	Other motor vehicle	

Location: FALLOWFIELD RD btwn O'KEEFE CRT & CEDARVIEW RD

Traffic Control: No control

Total Collisions: 4

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Sep-01, Thu,11:31	Clear	Sideswipe	P.D. only	Dry	East	Overtaking	Pick-up truck	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

2016-Jul-24, Sun,00:39	Clear	Approaching	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Jan-29, Thu,17:52	Snow	SMV other	P.D. only	Loose snow	East	Going ahead	Automobile, station wagon	Ditch	
2014-Nov-05, Wed,07:20	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Pick-up truck	Other motor vehicle	
					East	Going ahead	Truck - dump	Other motor vehicle	

Location: FALLOWFIELD RD btwn STRANDHERD DR & O'KEEFE CRT

Traffic Control: No control

Total Collisions: 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Apr-22, Fri,15:13	Rain	Rear end	P.D. only	Wet	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	

Location: O'KEEFE CRT btwn FOXTAIL AVE & FALLOWFIELD RD

Traffic Control: No control

Total Collisions: 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Aug-26, Wed,16:49	Clear	Rear end	P.D. only	Dry	West	Unknown	Unknown	Other motor vehicle	
					West	Stopped	Pick-up truck	Other motor vehicle	

Appendix F – Trip Generation Data

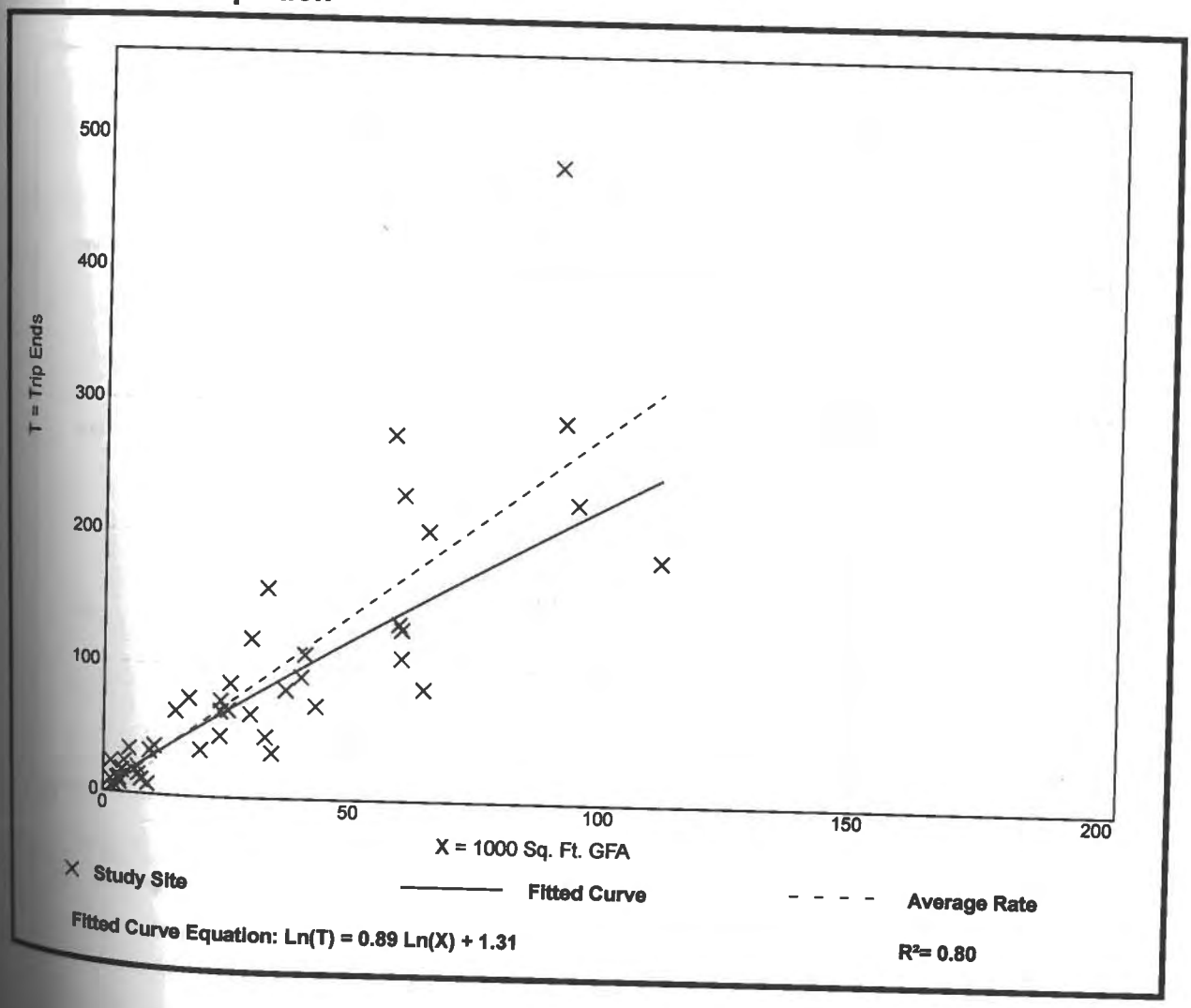
Medical-Dental Office Building
(720)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 44
1000 Sq. Ft. GFA: 32
Directional Distribution: 78% entering, 22% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
2.78	0.85 - 14.30	1.28

Data Plot and Equation



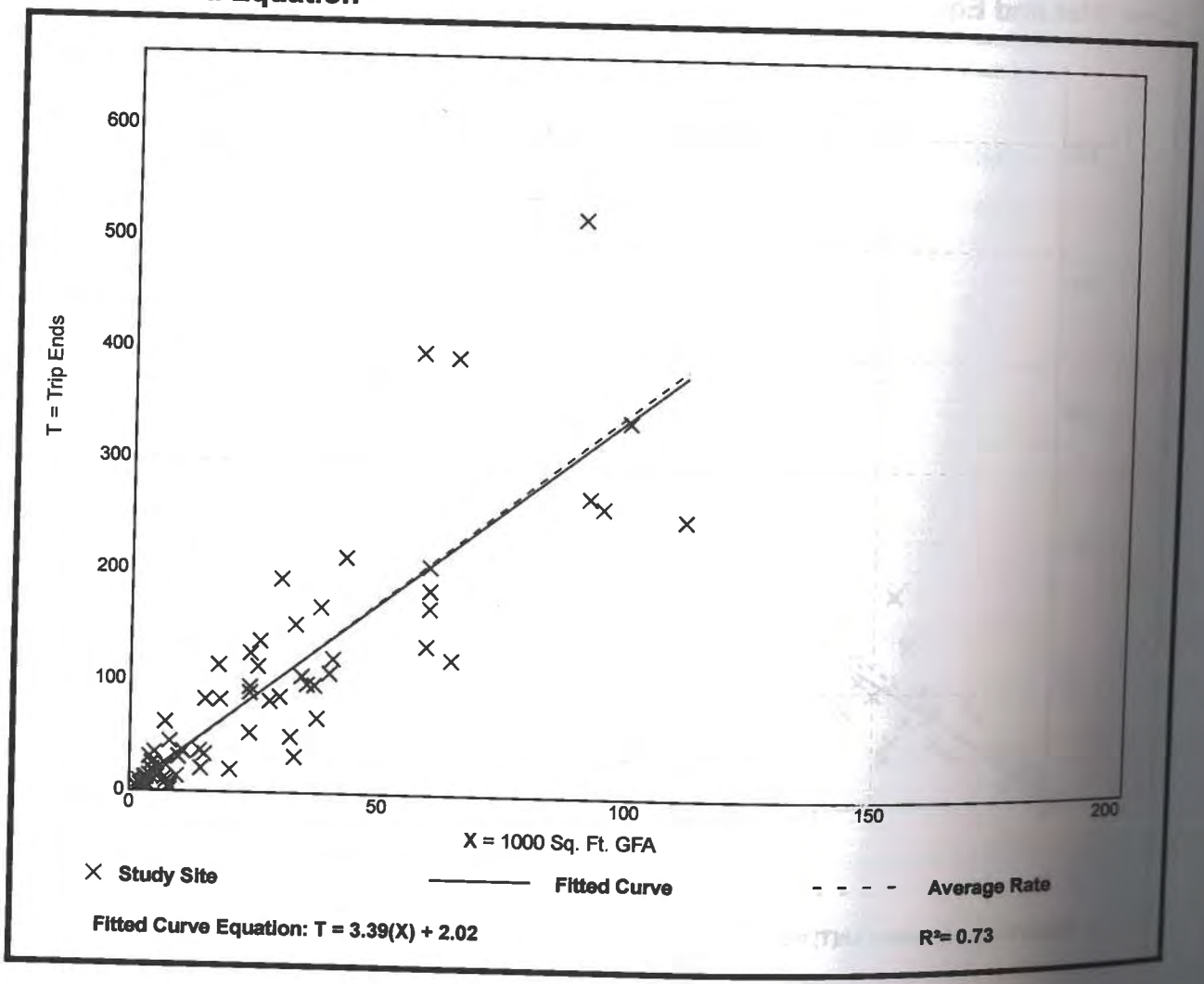
Medical-Dental Office Building
(720)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 65
1000 Sq. Ft. GFA: 28
Directional Distribution: 28% entering, 72% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.46	0.25 - 8.86	1.58

Data Plot and Equation



Quality Restaurant
(931)

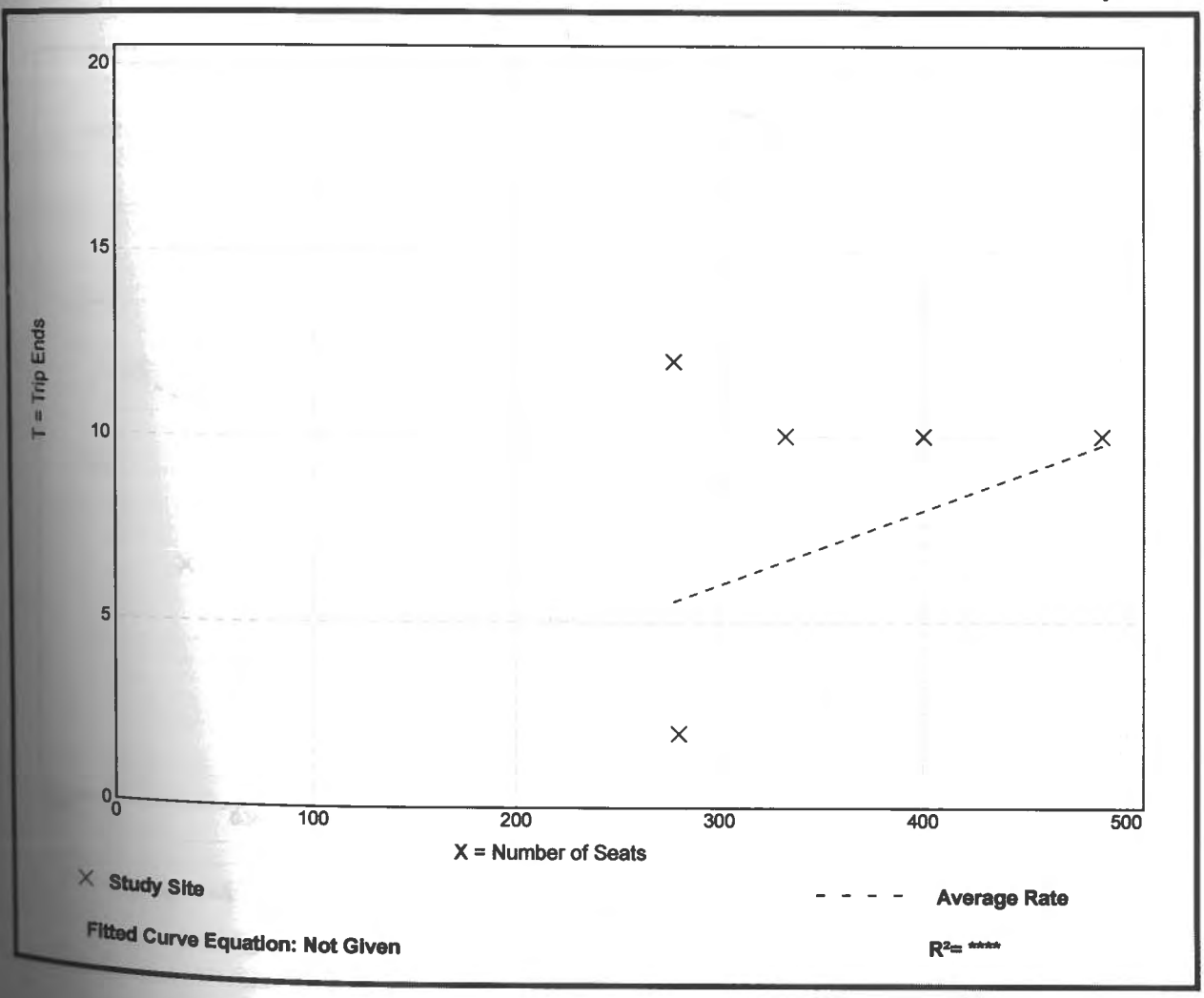
Vehicle Trip Ends vs: **Seats**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 5
Avg. Num. of Seats: 355
Directional Distribution: Not Available

Vehicle Trip Generation per Seat

Average Rate	Range of Rates	Standard Deviation
0.02	0.01 - 0.04	0.01

Data Plot and Equation

Caution – Small Sample Size



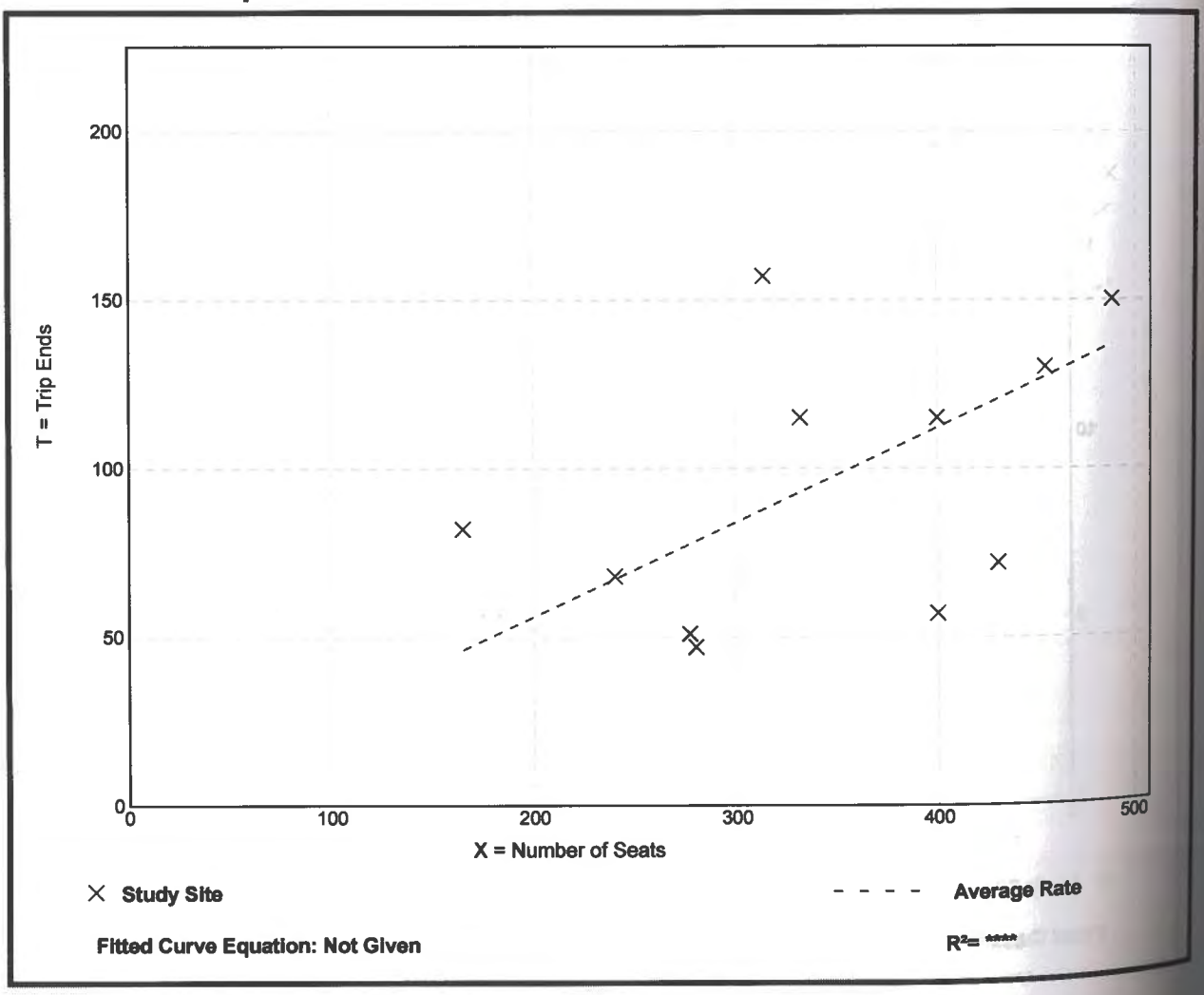
Quality Restaurant
(931)

Vehicle Trip Ends vs:	**Seats**
On a:	**Weekday,** **Peak Hour of Adjacent Street Traffic,** **One Hour Between 4 and 6 p.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	11
Avg. Num. of Seats:	344
Directional Distribution:	67% entering, 33% exiting

Vehicle Trip Generation per Seat

Average Rate	Range of Rates	Standard Deviation
0.28	0.14 - 0.50	0.11

Data Plot and Equation



South Nepean

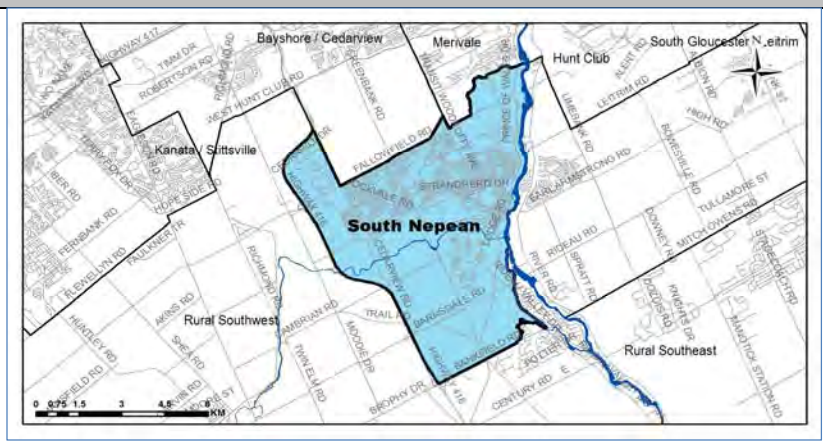
Demographic Characteristics

Population	72,750	Actively Travelled	57,830
Employed Population	35,540	Number of Vehicles	44,130
Households	26,260	Area (km^2)	54.8

Occupation Status (age 5+)	Male	Female	Total
Full Time Employed	17,630	14,730	32,350
Part Time Employed	620	2,570	3,190
Student	9,910	9,420	19,340
Retiree	3,420	4,200	7,620
Unemployed	720	500	1,220
Homemaker	180	2,390	2,570
Other	270	540	810
Total:	32,750	34,350	67,100

Traveller Characteristics	Male	Female	Total
Transit Pass Holders	5,590	6,100	11,700
Licensed Drivers	24,480	25,260	49,740
Telecommuters	60	310	370
Trips made by residents	88,180	97,380	185,550

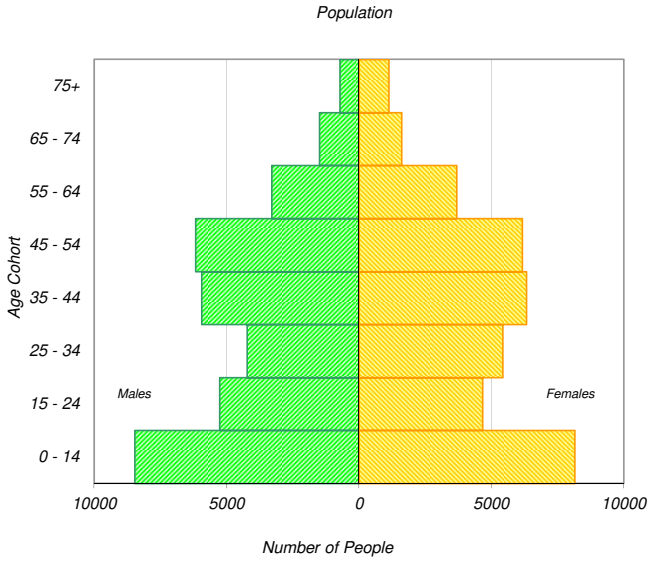
Selected Indicators	
Daily Trips per Person (age 5+)	2.77
Vehicles per Person	0.61
Number of Persons per Household	2.77
Daily Trips per Household	7.07
Vehicles per Household	1.68
Workers per Household	1.35
Population Density (Pop/km2)	1330

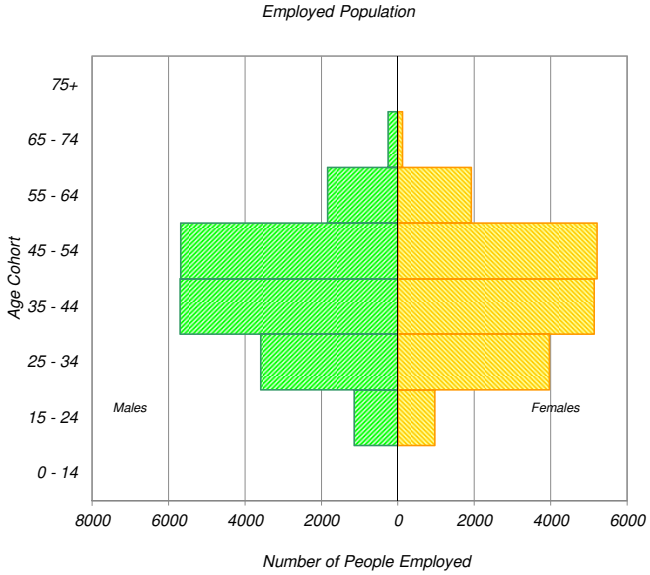


Household Size		
1 person	3,560	14%
2 persons	7,300	28%
3 persons	5,500	21%
4 persons	6,320	24%
5+ persons	3,590	14%
Total:	26,260	100%

Households by Vehicle Availability		
0 vehicles	810	3%
1 vehicle	9,500	36%
2 vehicles	13,800	53%
3 vehicles	1,730	7%
4+ vehicles	410	2%
Total:	26,260	100%

Households by Dwelling Type		
Single-detached	14,530	55%
Semi-detached	3,090	12%
Townhouse	7,770	30%
Apartment/Condo	870	3%
Total:	26,260	100%



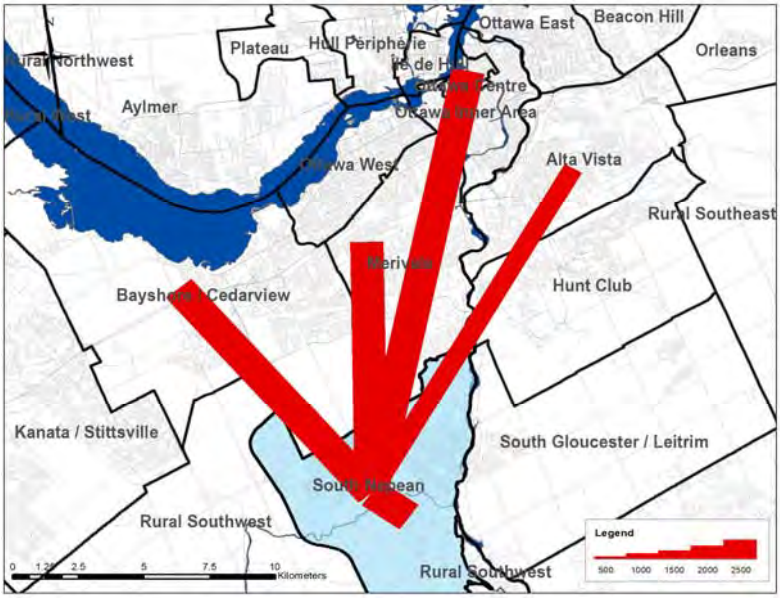


* In 2005 data was only collected for household members aged 11+ therefore these results cannot be compared to the 2011 data.

Travel Patterns

Top Five Destinations of Trips from South Nepean

AM Peak Period



Summary of Trips to and from South Nepean

AM Peak Period (6:30 - 8:59)	Destinations of Trips From		Origins of Trips To	
Districts	District	% Total	District	% Total
Ottawa Centre	3,820	9%	30	0%
Ottawa Inner Area	2,270	5%	340	1%
Ottawa East	630	2%	50	0%
Beacon Hill	370	1%	50	0%
Alta Vista	2,360	6%	460	2%
Hunt Club	920	2%	440	2%
Merivale	4,310	10%	790	3%
Ottawa West	1,830	4%	160	1%
Bayshore / Cedarview	3,230	8%	700	3%
Orléans	330	1%	200	1%
Rural East	20	0%	60	0%
Rural Southeast	250	1%	580	2%
South Gloucester / Leitrim	100	0%	310	1%
South Nepean	17,260	42%	17,260	74%
Rural Southwest	580	1%	970	4%
Kanata / Stittsvile	1,800	4%	690	3%
Rural West	80	0%	30	0%
Île de Hull	840	2%	50	0%
Hull Périphérie	260	1%	40	0%
Plateau	0	0%	40	0%
Aylmer	60	0%	40	0%
Rural Northwest	40	0%	40	0%
Pointe Gatineau	0	0%	0	0%
Gatineau Est	0	0%	20	0%
Rural Northeast	10	0%	20	0%
Buckingham / Masson-Angers	20	0%	0	0%
Ontario Sub-Total:	40,160	97%	23,120	99%
Québec Sub-Total:	1,230	3%	250	1%
Total:	41,390	100%	23,370	100%

Trips by Trip Purpose

24 Hours	From District		To District		Within District	
Work or related	25,640	41%	5,290	8%	4,680	6%
School	5,310	8%	1,430	2%	10,610	13%
Shopping	4,940	8%	4,220	7%	12,840	16%
Leisure	6,960	11%	4,020	6%	5,760	7%
Medical	1,720	3%	900	1%	840	1%
Pick-up / drive passenger	4,040	6%	3,920	6%	7,530	9%
Return Home	11,460	18%	40,960	65%	34,630	43%
Other	2,640	4%	2,090	3%	3,020	4%
Total:	62,710	100%	62,830	100%	79,910	100%

AM Peak (06:30 - 08:59)	From District		To District		Within District	
Work or related	18,160	75%	2,890	47%	2,120	12%
School	3,280	14%	1,170	19%	9,180	53%
Shopping	180	1%	70	1%	720	4%
Leisure	350	1%	230	4%	220	1%
Medical	400	2%	60	1%	100	1%
Pick-up / drive passenger	1,060	4%	770	13%	2,860	17%
Return Home	210	1%	640	10%	1,070	6%
Other	520	2%	290	5%	990	6%
Total:	24,160	100%	6,120	100%	17,260	100%

PM Peak (15:30 - 17:59)	From District		To District		Within District	
Work or related	410	5%	290	1%	410	2%
School	250	3%	0	0%	50	0%
Shopping	900	11%	1,090	5%	2,090	11%
Leisure	1,420	17%	790	3%	1,840	10%
Medical	190	2%	230	1%	90	0%
Pick-up / drive passenger	820	10%	1,700	7%	1,610	9%
Return Home	3,800	47%	18,990	81%	11,810	64%
Other	360	4%	490	2%	540	3%
Total:	8,150	100%	23,580	100%	18,440	100%

Peak Period (%)	Total:	% of 24 Hours	Within District (%)
24 Hours	205,450		39%
AM Peak Period	47,540	23%	36%
PM Peak Period	50,170	24%	37%

Trips by Primary Travel Mode

24 Hours	From District		To District		Within District	
Auto Driver	41,340	66%	41,280	66%	39,110	49%
Auto Passenger	9,400	15%	10,030	16%	15,320	19%
Transit	9,990	16%	9,520	15%	2,260	3%
Bicycle	310	0%	320	1%	960	1%
Walk	80	0%	170	0%	13,060	16%
Other	1,600	3%	1,520	2%	9,210	12%
Total:	62,720	100%	62,840	100%	79,920	100%

AM Peak (06:30 - 08:59)	From District		To District		Within District	
Auto Driver	14,570	60%	4,360	71%	5,800	34%
Auto Passenger	1,930	8%	780	13%	3,210	19%
Transit	6,610	27%	330	5%	730	4%
Bicycle	80	0%	50	1%	320	2%
Walk	20	0%	10	0%	3,000	17%
Other	930	4%	590	10%	4,200	24%
Total:	24,140	100%	6,120	100%	17,260	100%

PM Peak (15:30 - 17:59)	From District		To District		Within District	
Auto Driver	5,840	72%	14,640	62%	8,420	46%
Auto Passenger	1,730	21%	2,680	11%	3,930	21%
Transit	350	4%	5,770	24%	650	4%
Bicycle	80	1%	110	0%	150	1%
Walk	30	0%	0	0%	3,680	20%
Other	100	1%	380	2%	1,590	9%
Total:	8,130	100%	23,580	100%	18,420	100%

Avg Vehicle Occupancy	From District	To District	Within District
24 Hours	1.23	1.24	1.39
AM Peak Period	1.13	1.18	1.55
PM Peak Period	1.30	1.18	1.47

Transit Modal Split	From District	To District	Within District
24 Hours	16%	16%	4%
AM Peak Period	29%	6%	7%
PM Peak Period	4%	25%	5%

Appendix G – TDM Checklist

TDM-Supportive Development Design and Infrastructure Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

Legend

REQUIRED	The Official Plan or Zoning By-law provides related guidance that must be followed
BASIC	The measure is generally feasible and effective, and in most cases would benefit the development and its users
BETTER	The measure could maximize support for users of sustainable modes, and optimize development performance

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	☑
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☑
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☑
	1.2	**Facilities for walking & cycling**	
REQUIRED	1.2.1	Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations *(see Official Plan policy 4.3.3)*	☐ N/A - no rapid transit service exists within the vicinity of the proposed development
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible *(see Official Plan policy 4.3.12)*	☐ A network of sidewalks is proposed within the development

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks *(see Official Plan policy 4.3.10)*	☐ All sidewalks will be constructed per City standards
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps *(see Official Plan policy 4.3.10)*	☐ Proposed pedestrian facilities will conform to AODA standards
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians *(see Official Plan policy 4.3.11)*	☐
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☐
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☐
BASIC	1.2.8	Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	☐
	1.3	**Amenities for walking & cycling**	
BASIC	1.3.1	Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	☐
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	☐

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☐
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☑ Number of bicycle parking spaces exceeds Zoning Bylaw requirements and are located within close proximity to building entrances
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☑ All 5 bicycyle parking spaces are horizontal
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists	☐
BETTER	2.1.5	Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and ensure adequate capacity in peak cycling season	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single office building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☐ N/A
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met)	☐
	2.3	**Shower & change facilities**	
BASIC	2.3.1	Provide shower and change facilities for the use of active commuters	☐
BETTER	2.3.2	In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters	☐
	2.4	**Bicycle repair station**	
BETTER	2.4.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐

	TDM-supportive design & infrastructure measures: *Non-residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☐
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☐
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☐
	4.2	**Carpool parking**	
BASIC	4.2.1	Provide signed parking spaces for carpools in a priority location close to a major building entrance, sufficient in number to accommodate the mode share target for carpools	☐
BETTER	4.2.2	At large developments, provide spaces for carpools in a separate, access-controlled parking area to simplify enforcement	☐
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide carshare parking spaces in permitted non-residential zones, occupying either required or provided parking spaces *(see Zoning By-law Section 94)*	☐
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☐ Parking supply is within the permissible range specified in the Zoning Bylaw
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☐
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☐
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Separate short-term and long-term parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa)	☐
	7.	**OTHER**	
	7.1	**On-site amenities to minimize off-site trips**	
BETTER	7.1.1	Provide on-site amenities to minimize mid-day or mid-commute errands	☐

Appendix H – MMLOS Analyses

Multi-Modal Level of Service

115 Lusk Street TIA

Scenario: Existing Conditions

December 14, 2020

IBI

SEGMENTS			Fallowfield – Forager Street to O'Keefe Court		
			1	2	3
Pedestrian	Sidewalk Width		No Sidewalk		
	Boulevard Width		N/A		
	AADT		N/A		
	On-Street Parking		N/A		
	Operating Speed		61 km/h or more		
	Level of Service		F		
			F		
Cyclist	Type of Bikeway		Mixed Traffic		
	Number of Travel Lanes (per direction)		1 Travel Lane Per Direction		
	Raised Median?				
	Bike Lane Width				
	Operating Speed		≥ 70 km/h		
	Bike Lane Blockages (Commercial Areas)				
	Median Refuge				
	Number of Travel Lanes on Sidestreet				
	Sidestreet Operating Speed				
	Level of Service		F		
Transit	Facility Type		Mixed Traffic		
	Friction		Limited parking/driveway friction		
	Level of Service		D		
Truck	Curb Lane Width		≤3.5		
	Number of Travel Lanes		2		
			C		
			C		

Multi-Modal Level of Service

115 Lusk Street TIA

Scenario: Future Conditions

December 14, 2020

IBI

INTERSECTIONS		Fallowfield & O'Keefe Court / Cobble Hill Drive			
		NORTH leg	SOUTH leg	EAST leg	WEST leg
Pedestrian	Lanes (do NOT include lanes protected by bulb-outs)	4	4	2	3
	Median	No Median	No Median	No Median	No Median
	Island Refuge				
	Conflicting Left Turns (from street to right)	Permissive	Permissive	Permissive	Permissive
	Conflicting Right Turns (from street to left)	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control
	RTOR? (from street to left)	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed
	Ped Leading Interval? (on cross street)	No	No	No	No
	Corner Radius	> 10m to 15m	> 5m to 10m	> 5m to 10m	> 10m to 15m
	Right Turn Channel	No right turn channel	No right turn channel	No right turn channel	No right turn channel
	Crosswalk Type	Standard transverse markings	Standard transverse markings	Standard transverse markings	Standard transverse markings
	LOS (PETSI)	**53 D**	**54 D**	**86 B**	**70 C**
	Cycle Length (sec)	120	120	120	120
	Pedestrian Walk Time (solid white symbol) (sec)	7	7	7	7
	LOS (Delay,seconds)	**54.3 E**	**54.3 E**	**54.3 E**	**54.3 E**
	Overall Level of Service	**E**			
Cyclist	Type of Bikeway	Bike Pocket at Intersection	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Turning Speed (based on corner radius & angle)	Slow	Slow		
	Right Turn Storage Length	≤ 50m	> 50m		
	Dual Right Turn?	No	No		
	Shared Through-Right?	No	No	Yes	Yes
	Bike Box?	No	No	No	No
	Number of Lanes Crossed for Left Turns	1 Lane Crossed	1 Lane Crossed	No Lanes Crossed	1 Lane Crossed
	Operating Speed on Approach	≥ 60km/h	≥ 60km/h	≥ 60km/h	≥ 60km/h
	Dual Left Turn Lanes?	No	No	No	No
	Level of Service	**E**	**F**	**D**	**F**
		F			
Transit	Average Signal Delay	≤10 sec	≤10 sec		
	Level of Service	**B**	**B**		
		B			
Truck	Turning Radius (Right Turn)	10 to 15m	< 10m	< 10m	10 to 15m
	Number of Receiving Lanes	1	1	1	1
		E	**F**	**F**	**E**
		F			
Auto	**Level of Service**	**B (AM) / B (PM)**			

SEGMENTS			Fallowfield – Forager Street to O'Keefe Court		
			1	2	3
Pedestrian	Sidewalk Width		2.0 or more		
	Boulevard Width		> 2		
	AADT		> 3000		
	On-Street Parking		No		
	Operating Speed		61 km/h or more		
	Level of Service		**D**		
			D		
Cyclist	Type of Bikeway		Physically Separated Bikeway		
	Number of Travel Lanes (per direction)				
	Raised Median?				
	Bike Lane Width				
	Operating Speed				
	Bike Lane Blockages (Commercial Areas)				
	Median Refuge				
	Number of Travel Lanes on Sidestreet				
	Sidestreet Operating Speed				
	Level of Service		**A**		
Transit	Facility Type		Mixed Traffic		
	Friction		Limited parking/driveway friction		
	Level of Service		**D**		
Truck	Curb Lane Width		≤3.5		
	Number of Travel Lanes		2		
			C		
			C		

Appendix I – Intersection Control Warrants

Input Data Sheet

Analysis Sheet | Results Sheet | Proposed Collision | GO TO Justification:

What are the intersecting roadways? Fallowfield Road & O'Keefe Court / Cobble Hill Drive

What is the direction of the Main Road street? North-South

When was the data collected? Future (2028) Total Traffic

Justification 1 - 4: Volume Warrants

a.- Number of lanes on the Main Road? 1

b.- Number of lanes on the Minor Road? 1

c.- How many approaches? 4

d.- What is the operating environment? Urban **Population >= 10,000 AND Speed < 70 km/hr**

e.- What is the eight hour vehicle volume at the intersection? (Please fill in table below)

Hour Ending	Main Northbound Approach			Minor Eastbound Approach			Main Southbound Approach			Minor Westbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
7:00	119	646	9	30	6	32	8	881	88	39	7	42	
8:00	60	323	5	15	3	16	4	441	44	20	4	21	
9:00	60	323	5	15	3	16	4	441	44	20	4	21	
10:00	60	323	5	15	3	16	4	441	44	20	4	21	
15:00	52	661	23	107	3	114	17	767	38	9	1	20	
16:00	26	331	12	54	2	57	9	384	19	5	1	10	
17:00	26	331	12	54	2	57	9	384	19	5	1	10	
18:00	26	331	12	54	2	57	9	384	19	5	1	10	
Total	**428**	**3,268**	**80**	**343**	**23**	**365**	**63**	**4,120**	**315**	**120**	**20**	**155**	**0**

Justification 5: Collision Experience

Preceding Months	Number of Collisions*
1-12	
13-24	
25-36	

* Include only collisions that are susceptable to correction through the installation of traffic signal control

Justification 6: Pedestrian Volume

a.- Please fill in table below summarizing total pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume									
Factored 8 hour pedestrian volume	0		0		0		0		
% Assigned to crossing rate									
Net 8 Hour Pedestrian Volume at Crossing									0
Net 8 Hour Vehicular Volume on Street Being Crossed									6,411

b.- Please fill in table below summarizing delay to pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	0	0	0	0	0	0	0	0	
Total 8 hour pedestrians delayed greater than 10 seconds									
Factored volume of total pedestrians	0		0		0		0		
Factored volume of delayed pedestrians	0		0		0		0		
% Assigned to Crossing Rate	0%		0%		0%		0%		
Net 8 Hour Volume of Total Pedestrians									0
Net 8 Hour Volume of Delayed Pedestrians									0

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

GO TO Justification:

Intersection: Fallowfield Road & O'Keefe Court / Cobble Hill Drive Count Date: Future (2028) Total Traffic

Summary Results

Justification			Compliance		Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	100	%	☐	☑
	B	Crossing Volume	69	%		
2. Delay to Cross Traffic	A	Main Road	100	%	☐	☑
	B	Crossing Road	74	%		
3. Combination	A	Justificaton 1	69	%	☐	☑
	B	Justification 2	74	%		
4. 4-Hr Volume			67	%	☐	☑
5. Collision Experience			0	%	☐	☑
6. Pedestrians	A	Volume	Justification not met		☐	☑
	B	Delay	Justification not met			

City of Ottawa
Roundabout Initial Feasability Screening Tool

The intent of this screening tool is to provide a relatively quick assessment of the feasibility of a roundabout at a particular intersection in comparison to other appropriate forms of traffic control or road modifications including all-way stop control, traffic signals, auxiliary lanes, etc. The intended outcome of this tool is to provide enough information to assist staff in deciding whether or not to proceed with an Intersection Control Study to investigate the feasibility of a roundabout in more detail.

1	Project Name:	115 Lusk Street - Transportation Impact Assessment
2	Intersection:	Fallowfield Road & O'Keefe Court / Cobble Hill Drive
3	Location and Description of Intersection: Lane Configuration, total or approach AADT, distance to nearby intersection(s), etc. Attach or sketch a diagram and include existing and/or horizon-year turning movements. If an existing intersection then indicate type of control	The intersection is currently configured as a two-way stop-controlled intersection with free-flow on Fallowfield Road.
4	What traditional modifications are proposed? All-way stop control, traffic signals, auxiliary lanes, etc. Attach or sketch a diagram if necessary.	Traffic signals.
5	What size of roundabout is being considered? Describe, and attach a Roundabout Traffic Flow Worksheet	Multi-lane roundabout.
6	Why is a roundabout being considered?	As an alternative to traffic signals.

7 Are there contra-indications for a roundabout?

If "Yes" is indicated for one or more of the contra-indications then a roundabout may be problematic at the subject intersection. That is not to say that a

No.	Contra-Indication	Outcome
1	Is there insufficient property at the intersection (i.e. less than 44 metres diameter if considering a single-lane roundabout, and less than 60 metres if considering a two-lane roundabout) or property constraints that would require demolition of adjacent structures?	Yes ☐ No ☒
2	Are there any instances where stopping sight distance (SSD) of a roundabout yield line may not be attainable (i.e. the intersection is on a crest vertical curve)?	Yes ☐ No ☒
3	Is there an existing uncontrolled approach with a grade in excess of 4 percent?	Yes ☐ No ☒
4	Is the intersection located within a coordinated signal system?	Yes ☐ No ☒
5	Is there a closely-spaced traffic signal or railway crossing that could not be controlled with a nearby roundabout?	Yes ☐ No ☒
6	Are significant differences in directional flows or any situations of sudden high demand expected?	Yes ☐ No ☒
7	Are there known visually-impaired pedestrians that cross this intersection?	Yes ☐ No ☒

8 Are there suitability factors for a roundabout?

If "Yes" is indicated for two or more of the suitability factors then a roundabout should be technically feasible at the subject intersection..

No.	Suitability Factor	Outcome
1	Does the intersection currently experience an average collision frequency of more than 1.5 injury crashes per year, or a collision rate in excess of 1 injury crash per 1 million vehicles entering (MVE)?	Yes ☐ No ☒
2	Has there been a fatal crash at the intersection in the last 10 years?	Yes ☐ No ☒
3	Are capacity problems currently being experienced, or expected in the future?	Yes ☒ No ☐
4	Are traffic signals warranted, or expected to be warranted in the future?	Yes ☐ No ☒
5	Does the intersection have more than 4 legs, or unusual geometry?	Yes ☐ No ☒
6	Will Planned modifications to the intersection require that nearby structures be widened (i.e. to accommodate left-turn lanes)?	Yes ☐ No ☒
7	Is the intersection located at a transition between rural and urban environments (i.e. an urban boundary) such that a roundabout could act as a means of speed transition?	Yes ☐ No ☒

9	Conclusions/recommendation whether to proceed with an Intersection Control Study:	The results of the Roundabout Screening Tool indicate that the a roundabout is not feasible or recommended at the intersection of Fallowfield & O'Keefe/ Cobble Hill, given that only one of the suitability factors is met.

Appendix J – Intersection Capacity Analyses

Existing Traffic

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	2	13	9	1	20	12	337	23	17	578	5
Future Vol, veh/h	5	2	13	9	1	20	12	337	23	17	578	5
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	500	-	-	-	-	-	1400	-	0	600	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	0	4	0	6	4	0
Mvmt Flow	6	2	14	10	1	22	13	374	26	19	642	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1107	1106	642	1091	1086	376	648	0	0	400	0	0
Stage 1	680	680	-	400	400	-	-	-	-	-	-	-
Stage 2	427	426	-	691	686	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.16	-	-
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	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.254	-	-
Pot Cap-1 Maneuver	189	212	478	194	218	675	947	-	-	1137	-	-
Stage 1	444	454	-	630	605	-	-	-	-	-	-	-
Stage 2	610	589	-	438	451	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	177	205	478	182	211	674	947	-	-	1137	-	-
Mov Cap-2 Maneuver	177	205	-	182	211	-	-	-	-	-	-	-
Stage 1	438	446	-	621	597	-	-	-	-	-	-	-
Stage 2	580	581	-	416	443	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.2	16.1	0.3	0.2
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	947	-	-	177	406	358	1137	-	-
HCM Lane V/C Ratio	0.014	-	-	0.031	0.041	0.093	0.017	-	-
HCM Control Delay (s)	8.9	-	-	26	14.2	16.1	8.2	-	-
HCM Lane LOS	A	-	-	D	B	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0.3	0.1	-	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	6	9	39	7	42	5	496	9	8	454	5
Future Vol, veh/h	2	6	9	39	7	42	5	496	9	8	454	5
Conflicting Peds, #/hr	0	0	1	1	0	0	1	0	1	1	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	500	-	-	-	-	-	1400	-	0	600	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	5	3	14	0	0	5	56	12	4	0
Mvmt Flow	2	7	10	43	8	47	6	551	10	9	504	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1119	1097	506	1099	1093	552	511	0	0	562	0	0
Stage 1	523	523	-	564	564	-	-	-	-	-	-	-
Stage 2	596	574	-	535	529	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.25	7.13	6.64	6.2	4.1	-	-	4.22	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.64	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.64	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.345	3.527	4.126	3.3	2.2	-	-	2.308	-	-
Pot Cap-1 Maneuver	186	215	560	189	204	537	1065	-	-	961	-	-
Stage 1	541	534	-	509	490	-	-	-	-	-	-	-
Stage 2	494	506	-	527	508	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	163	211	559	179	201	536	1064	-	-	960	-	-
Mov Cap-2 Maneuver	163	211	-	179	201	-	-	-	-	-	-	-
Stage 1	537	529	-	505	487	-	-	-	-	-	-	-
Stage 2	441	502	-	506	503	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.5	26.2	0.1	0.2
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1064	-	-	163	337	266	960	-	-
HCM Lane V/C Ratio	0.005	-	-	0.014	0.049	0.368	0.009	-	-
HCM Control Delay (s)	8.4	-	-	27.4	16.2	26.2	8.8	-	-
HCM Lane LOS	A	-	-	D	C	D	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	1.6	0	-	-

Future (2023) Background Traffic

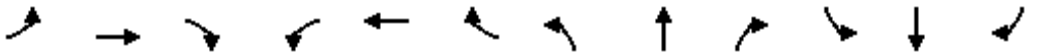
Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	6	32	39	7	42	116	573	9	8	670	88
Future Vol, veh/h	27	6	32	39	7	42	116	573	9	8	670	88
Conflicting Peds, #/hr	0	0	1	1	0	0	1	0	1	1	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	500	-	-	-	-	-	1400	-	0	600	-	250
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	5	3	14	0	0	5	56	12	4	0
Mvmt Flow	27	6	32	39	7	42	116	573	9	8	670	88

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1521	1502	672	1556	1581	574	759	0	0	583	0	0
Stage 1	687	687	-	806	806	-	-	-	-	-	-	-
Stage 2	834	815	-	750	775	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.25	7.13	6.64	6.2	4.1	-	-	4.22	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.64	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.64	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.345	3.527	4.126	3.3	2.2	-	-	2.308	-	-
Pot Cap-1 Maneuver	98	123	451	91	102	522	862	-	-	944	-	-
Stage 1	440	450	-	374	378	-	-	-	-	-	-	-
Stage 2	365	394	-	402	391	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	75	105	450	72	87	521	861	-	-	943	-	-
Mov Cap-2 Maneuver	75	105	-	72	87	-	-	-	-	-	-	-
Stage 1	380	446	-	323	327	-	-	-	-	-	-	-
Stage 2	284	340	-	365	387	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	43.4	83.6	1.6	0.1
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	861	-	-	75	296	125	943	-	-
HCM Lane V/C Ratio	0.135	-	-	0.36	0.128	0.704	0.008	-	-
HCM Control Delay (s)	9.8	-	-	77.9	18.9	83.6	8.8	-	-
HCM Lane LOS	A	-	-	F	C	F	A	-	-
HCM 95th %tile Q(veh)	0.5	-	-	1.4	0.4	3.9	0	-	-

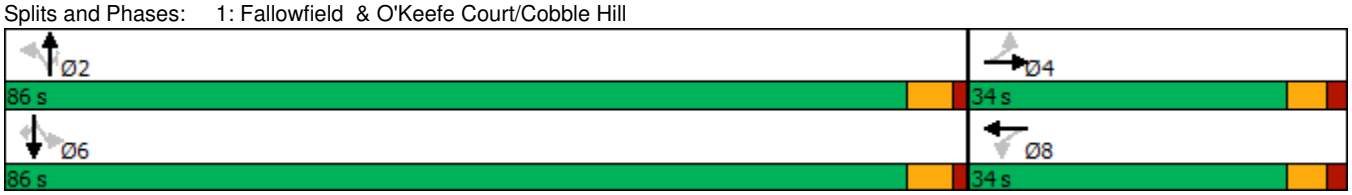


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	6	32	39	7	42	116	573	9	8	670	88
Future Volume (vph)	27	6	32	39	7	42	116	573	9	8	670	88
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	50.0		0.0	0.0		0.0	140.0		0.0	60.0		25.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98			1.00		1.00		0.98	1.00		0.98
Frt		0.874			0.936				0.850			0.850
Flt Protected	0.950				0.978		0.950			0.950		
Satd. Flow (prot)	1729	1498	0	0	1626	0	1729	1733	992	1544	1750	1547
Flt Permitted	0.680				0.839		0.382			0.430		
Satd. Flow (perm)	1238	1498	0	0	1394	0	695	1733	969	698	1750	1512
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		32			36				23			51
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		201.1			305.1			207.2			300.4	
Travel Time (s)		14.5			22.0			12.4			18.0	
Confl. Peds. (#/hr)			1	1			1		1	1		1
Peak Hour 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
Heavy Vehicles (%)	0%	0%	5%	3%	14%	0%	0%	5%	56%	12%	4%	0%
Adj. Flow (vph)	27	6	32	39	7	42	116	573	9	8	670	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	38	0	0	88	0	116	573	9	8	670	88
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	33.5	33.5		33.5	33.5		27.4	27.4	27.4	27.4	27.4	27.4
Total Split (s)	34.0	34.0		34.0	34.0		86.0	86.0	86.0	86.0	86.0	86.0
Total Split (%)	28.3%	28.3%		28.3%	28.3%		71.7%	71.7%	71.7%	71.7%	71.7%	71.7%
Maximum Green (s)	28.5	28.5		28.5	28.5		80.6	80.6	80.6	80.6	80.6	80.6
Yellow Time (s)	3.6	3.6		3.6	3.6		4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	1.9	1.9		1.9	1.9		1.3	1.3	1.3	1.3	1.3	1.3
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)	5.5	5.5			5.5		5.4	5.4	5.4	5.4	5.4	5.4
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
Recall Mode	None	None		None	None		Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	21.0	21.0		21.0	21.0		15.0	15.0	15.0	15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	9.4	9.4			9.4		87.5	87.5	87.5	87.5	87.5	87.5
Actuated g/C Ratio	0.09	0.09			0.09		0.84	0.84	0.84	0.84	0.84	0.84
v/c Ratio	0.24	0.23			0.56		0.20	0.39	0.01	0.01	0.46	0.07

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	47.9	20.5			41.5		3.7	4.0	0.4	2.8	4.5	1.5
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	20.5			41.5		3.7	4.0	0.4	2.8	4.5	1.5
LOS	D	C			D		A	A	A	A	A	A
Approach Delay		31.9			41.5			3.9			4.1	
Approach LOS		C			D			A			A	
Queue Length 50th (m)	5.1	1.1			10.0		4.1	25.3	0.0	0.3	32.2	1.1
Queue Length 95th (m)	13.2	10.3			24.7		11.1	49.7	0.5	1.4	62.9	4.7
Internal Link Dist (m)		177.1			281.1			183.2			276.4	
Turn Bay Length (m)	50.0						140.0			60.0		25.0
Base Capacity (vph)	337	432			406		582	1451	815	584	1466	1275
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	0.08	0.09			0.22		0.20	0.39	0.01	0.01	0.46	0.07

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 104.5			
Natural Cycle: 70			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 7.2		Intersection LOS: A	
Intersection Capacity Utilization 69.6%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Fallowfield & O'Keefe Court/Cobble Hill



Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	31	0	25	173	0	23
Future Vol, veh/h	31	0	25	173	0	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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, %	3	0	0	6	0	0
Mvmt Flow	31	0	25	173	0	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	31	0	254	31
Stage 1	-	-	-	-	31	-
Stage 2	-	-	-	-	223	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1595	-	739	1049
Stage 1	-	-	-	-	997	-
Stage 2	-	-	-	-	819	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1595	-	726	1049
Mov Cap-2 Maneuver	-	-	-	-	726	-
Stage 1	-	-	-	-	997	-
Stage 2	-	-	-	-	805	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	8.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1049	-	-	1595	-
HCM Lane V/C Ratio	0.022	-	-	0.016	-
HCM Control Delay (s)	8.5	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	13	0	699	737	8
Future Vol, veh/h	0	13	0	699	737	8
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	-	-	-	250
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	6	4	0
Mvmt Flow	0	13	0	699	737	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	737	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	422	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	422	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	422	-	-
HCM Lane V/C Ratio	-	0.031	-	-
HCM Control Delay (s)	-	13.8	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Intersection	
Int Delay, s/veh	8.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	98	3	114	9	1	20	45	504	23	17	679	38
Future Vol, veh/h	98	3	114	9	1	20	45	504	23	17	679	38
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	500	-	-	-	-	-	1400	-	0	600	-	250
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	4	0	6	4	0
Mvmt Flow	98	3	114	9	1	20	45	504	23	17	679	38

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1331	1330	679	1385	1345	506	717	0	0	527	0	0
Stage 1	713	713	-	594	594	-	-	-	-	-	-	-
Stage 2	618	617	-	791	751	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.16	-	-
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	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.254	-	-
Pot Cap-1 Maneuver	133	156	455	122	153	570	893	-	-	1020	-	-
Stage 1	426	438	-	495	496	-	-	-	-	-	-	-
Stage 2	480	484	-	386	421	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	121	146	455	85	143	569	893	-	-	1020	-	-
Mov Cap-2 Maneuver	121	146	-	85	143	-	-	-	-	-	-	-
Stage 1	405	431	-	470	471	-	-	-	-	-	-	-
Stage 2	438	460	-	282	414	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	56.6	25.8	0.7	0.2
HCM LOS	F	D		

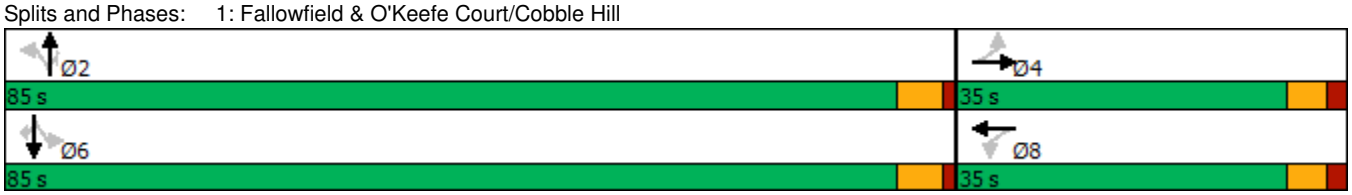
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	893	-	-	121	432	203	1020	-	-
HCM Lane V/C Ratio	0.05	-	-	0.81	0.271	0.148	0.017	-	-
HCM Control Delay (s)	9.2	-	-	104.6	16.4	25.8	8.6	-	-
HCM Lane LOS	A	-	-	F	C	D	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	4.8	1.1	0.5	0.1	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	3	114	9	1	20	45	504	23	17	679	38
Future Volume (vph)	98	3	114	9	1	20	45	504	23	17	679	38
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	50.0		0.0	0.0		0.0	140.0		0.0	60.0		25.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				0.98							
Frt		0.854			0.910				0.850			0.850
Flt Protected	0.950				0.985		0.950			0.950		
Satd. Flow (prot)	1729	1554	0	0	1605	0	1729	1750	1547	1631	1750	1547
Flt Permitted	0.738				0.895		0.362			0.456		
Satd. Flow (perm)	1338	1554	0	0	1458	0	659	1750	1547	783	1750	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		114			20				23			23
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		201.1			305.1			207.2			300.4	
Travel Time (s)		14.5			22.0			12.4			18.0	
Confl. Peds. (#/hr)	2					2						
Peak Hour 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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	4%	0%	6%	4%	0%
Adj. Flow (vph)	98	3	114	9	1	20	45	504	23	17	679	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	98	117	0	0	30	0	45	504	23	17	679	38
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	33.5	33.5		33.5	33.5		27.4	27.4	27.4	27.4	27.4	27.4
Total Split (s)	35.0	35.0		35.0	35.0		85.0	85.0	85.0	85.0	85.0	85.0
Total Split (%)	29.2%	29.2%		29.2%	29.2%		70.8%	70.8%	70.8%	70.8%	70.8%	70.8%
Maximum Green (s)	29.5	29.5		29.5	29.5		79.6	79.6	79.6	79.6	79.6	79.6
Yellow Time (s)	3.6	3.6		3.6	3.6		4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	1.9	1.9		1.9	1.9		1.3	1.3	1.3	1.3	1.3	1.3
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)	5.5	5.5			5.5		5.4	5.4	5.4	5.4	5.4	5.4
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
Recall Mode	None	None		None	None		Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	21.0	21.0		21.0	21.0		15.0	15.0	15.0	15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	13.0	13.0			13.0		82.6	82.6	82.6	82.6	82.6	82.6
Actuated g/C Ratio	0.12	0.12			0.12		0.77	0.77	0.77	0.77	0.77	0.77
v/c Ratio	0.60	0.40			0.15		0.09	0.37	0.02	0.03	0.50	0.03

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	58.5	12.4			23.0		4.1	5.1	1.5	3.7	6.4	2.1
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.5	12.4			23.0		4.1	5.1	1.5	3.7	6.4	2.1
LOS	E	B			C		A	A	A	A	A	A
Approach Delay		33.4			23.0			4.9			6.2	
Approach LOS		C			C			A			A	
Queue Length 50th (m)	18.9	0.6			1.8		1.8	26.5	0.0	0.7	41.5	0.6
Queue Length 95th (m)	35.2	15.7			10.0		5.7	51.1	2.0	2.7	79.6	3.3
Internal Link Dist (m)		177.1			281.1			183.2			276.4	
Turn Bay Length (m)	50.0						140.0			60.0		25.0
Base Capacity (vph)	370	512			418		510	1356	1204	607	1356	1204
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	0.26	0.23			0.07		0.09	0.37	0.02	0.03	0.50	0.03

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 106.6			
Natural Cycle: 70			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 9.8		Intersection LOS: A	
Intersection Capacity Utilization 61.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Fallowfield & O'Keefe Court/Cobble Hill



Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	178	0	26	32	0	14
Future Vol, veh/h	178	0	26	32	0	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	0
Mvmt Flow	178	0	26	32	0	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	178	0	262	178
Stage 1	-	-	-	-	178	-
Stage 2	-	-	-	-	84	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1410	-	731	870
Stage 1	-	-	-	-	858	-
Stage 2	-	-	-	-	944	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1410	-	717	870
Mov Cap-2 Maneuver	-	-	-	-	717	-
Stage 1	-	-	-	-	858	-
Stage 2	-	-	-	-	926	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.4	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	870	-	-	1410	-
HCM Lane V/C Ratio	0.016	-	-	0.018	-
HCM Control Delay (s)	9.2	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	17	0	575	798	7
Future Vol, veh/h	0	17	0	575	798	7
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	-	-	-	250
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	3	4	0
Mvmt Flow	0	17	0	575	798	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	798	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	389	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	389	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	389	-	-
HCM Lane V/C Ratio	-	0.044	-	-
HCM Control Delay (s)	-	14.7	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Future (2028) Background Traffic

Intersection	
Int Delay, s/veh	14.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	6	32	39	7	42	116	646	9	8	876	88
Future Vol, veh/h	27	6	32	39	7	42	116	646	9	8	876	88
Conflicting Peds, #/hr	0	0	1	1	0	0	1	0	1	1	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	500	-	-	-	-	-	1400	-	0	600	-	250
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	5	3	14	0	0	5	56	12	4	0
Mvmt Flow	27	6	32	39	7	42	116	646	9	8	876	88

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1800	1781	878	1835	1860	647	965	0	0	656	0	0
Stage 1	893	893	-	879	879	-	-	-	-	-	-	-
Stage 2	907	888	-	956	981	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.25	7.13	6.64	6.2	4.1	-	-	4.22	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.64	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.64	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.345	3.527	4.126	3.3	2.2	-	-	2.308	-	-
Pot Cap-1 Maneuver	63	83	343	58	68	475	722	-	-	886	-	-
Stage 1	339	363	-	341	349	-	-	-	-	-	-	-
Stage 2	333	365	-	309	312	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	45	69	342	43	56	475	721	-	-	885	-	-
Mov Cap-2 Maneuver	45	69	-	43	56	-	-	-	-	-	-	-
Stage 1	284	359	-	286	292	-	-	-	-	-	-	-
Stage 2	249	306	-	273	309	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	84.6	229.5	1.6	0.1
HCM LOS	F	F		

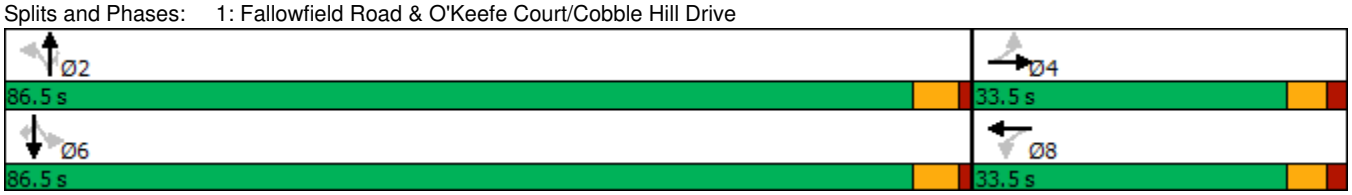
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	721	-	-	45	210	79	885	-	-
HCM Lane V/C Ratio	0.161	-	-	0.6	0.181	1.114	0.009	-	-
HCM Control Delay (s)	10.9	-	-	167.3	25.9	229.5	9.1	-	-
HCM Lane LOS	B	-	-	F	D	F	A	-	-
HCM 95th %tile Q(veh)	0.6	-	-	2.2	0.6	6.3	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	6	32	39	7	42	116	646	9	8	876	88
Future Volume (vph)	27	6	32	39	7	42	116	646	9	8	876	88
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	50.0		0.0	0.0		0.0	140.0		0.0	60.0		25.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98			1.00				0.98	1.00		0.98
Frt		0.874			0.936				0.850			0.850
Flt Protected	0.950				0.978		0.950			0.950		
Satd. Flow (prot)	1729	1498	0	0	1626	0	1729	1733	992	1544	1750	1547
Flt Permitted	0.678				0.839		0.289			0.394		
Satd. Flow (perm)	1234	1498	0	0	1394	0	526	1733	969	640	1750	1512
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		32			36				23			40
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		201.1			305.1			207.2			300.4	
Travel Time (s)		14.5			22.0			12.4			18.0	
Confl. Peds. (#/hr)			1	1			1		1	1		1
Peak Hour 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
Heavy Vehicles (%)	0%	0%	5%	3%	14%	0%	0%	5%	56%	12%	4%	0%
Adj. Flow (vph)	27	6	32	39	7	42	116	646	9	8	876	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	38	0	0	88	0	116	646	9	8	876	88
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	33.5	33.5		33.5	33.5		27.4	27.4	27.4	27.4	27.4	27.4
Total Split (s)	33.5	33.5		33.5	33.5		86.5	86.5	86.5	86.5	86.5	86.5
Total Split (%)	27.9%	27.9%		27.9%	27.9%		72.1%	72.1%	72.1%	72.1%	72.1%	72.1%
Maximum Green (s)	28.0	28.0		28.0	28.0		81.1	81.1	81.1	81.1	81.1	81.1
Yellow Time (s)	3.6	3.6		3.6	3.6		4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	1.9	1.9		1.9	1.9		1.3	1.3	1.3	1.3	1.3	1.3
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)	5.5	5.5			5.5		5.4	5.4	5.4	5.4	5.4	5.4
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
Recall Mode	None	None		None	None		Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	21.0	21.0		21.0	21.0		15.0	15.0	15.0	15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	9.5	9.5			9.5		88.1	88.1	88.1	88.1	88.1	88.1
Actuated g/C Ratio	0.09	0.09			0.09		0.84	0.84	0.84	0.84	0.84	0.84
v/c Ratio	0.25	0.23			0.56		0.26	0.44	0.01	0.01	0.60	0.07

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	48.3	20.6			41.6		4.6	4.4	0.4	2.8	6.2	1.7
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.3	20.6			41.6		4.6	4.4	0.4	2.8	6.2	1.7
LOS	D	C			D		A	A	A	A	A	A
Approach Delay		32.1			41.6			4.4			5.8	
Approach LOS		C			D			A			A	
Queue Length 50th (m)	5.1	1.1			10.0		4.4	30.8	0.0	0.3	52.4	1.5
Queue Length 95th (m)	13.3	10.4			24.9		12.7	59.8	0.5	1.4	104.1	5.2
Internal Link Dist (m)		177.1			281.1			183.2			276.4	
Turn Bay Length (m)	50.0						140.0			60.0		25.0
Base Capacity (vph)	329	423			398		441	1452	816	536	1467	1274
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	0.08	0.09			0.22		0.26	0.44	0.01	0.01	0.60	0.07

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 105.1			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 7.8		Intersection LOS: A	
Intersection Capacity Utilization 81.1%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Fallowfield Road & O'Keefe Court/Cobble Hill Drive



Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	31	0	25	173	0	23
Future Vol, veh/h	31	0	25	173	0	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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, %	3	0	0	6	0	0
Mvmt Flow	31	0	25	173	0	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	31	0	254	31
Stage 1	-	-	-	-	31	-
Stage 2	-	-	-	-	223	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1595	-	739	1049
Stage 1	-	-	-	-	997	-
Stage 2	-	-	-	-	819	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1595	-	726	1049
Mov Cap-2 Maneuver	-	-	-	-	726	-
Stage 1	-	-	-	-	997	-
Stage 2	-	-	-	-	805	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	8.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1049	-	-	1595	-
HCM Lane V/C Ratio	0.022	-	-	0.016	-
HCM Control Delay (s)	8.5	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	13	0	773	949	8
Future Vol, veh/h	0	13	0	773	949	8
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	-	-	-	250
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	6	4	0
Mvmt Flow	0	13	0	773	949	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	949	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	319	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	319	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	319	-	-
HCM Lane V/C Ratio	-	0.041	-	-
HCM Control Delay (s)	-	16.8	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Intersection	
Int Delay, s/veh	16

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	98	3	114	9	1	20	45	661	23	17	757	38
Future Vol, veh/h	98	3	114	9	1	20	45	661	23	17	757	38
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	500	-	-	-	-	-	1400	-	0	600	-	250
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	4	0	6	4	0
Mvmt Flow	98	3	114	9	1	20	45	661	23	17	757	38

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1566	1565	757	1620	1580	663	795	0	0	684	0	0
Stage 1	791	791	-	751	751	-	-	-	-	-	-	-
Stage 2	775	774	-	869	829	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.16	-	-
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	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.254	-	-
Pot Cap-1 Maneuver	~ 91	113	411	84	110	465	835	-	-	891	-	-
Stage 1	386	404	-	406	421	-	-	-	-	-	-	-
Stage 2	394	411	-	349	388	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 82	105	411	56	102	464	835	-	-	891	-	-
Mov Cap-2 Maneuver	~ 82	105	-	56	102	-	-	-	-	-	-	-
Stage 1	365	396	-	384	398	-	-	-	-	-	-	-
Stage 2	355	389	-	246	381	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	125.2	37.6	0.6	0.2
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	835	-	-	82	382	140	891	-	-
HCM Lane V/C Ratio	0.054	-	-	1.195	0.306	0.214	0.019	-	-
HCM Control Delay (s)	9.6	-	-	252.6	18.5	37.6	9.1	-	-
HCM Lane LOS	A	-	-	F	C	E	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	7.1	1.3	0.8	0.1	-	-

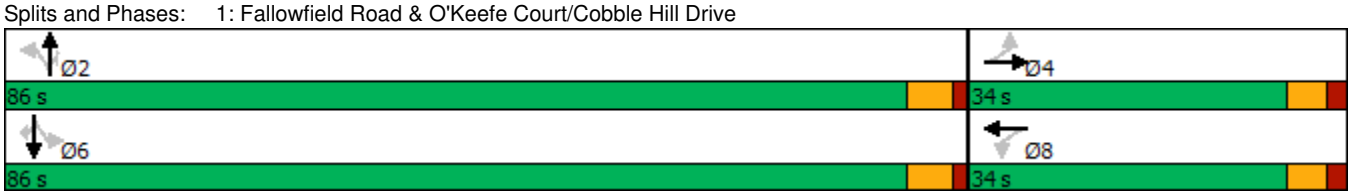
Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	3	114	9	1	20	45	661	23	17	757	38
Future Volume (vph)	98	3	114	9	1	20	45	661	23	17	757	38
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	50.0		0.0	0.0		0.0	140.0		0.0	60.0		25.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				0.98							
Frt		0.854			0.910				0.850			0.850
Flt Protected	0.950				0.985		0.950			0.950		
Satd. Flow (prot)	1729	1554	0	0	1605	0	1729	1750	1547	1631	1750	1547
Flt Permitted	0.738				0.895		0.324			0.372		
Satd. Flow (perm)	1338	1554	0	0	1458	0	590	1750	1547	639	1750	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		114			20				23			23
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		201.1			305.1			207.2			300.4	
Travel Time (s)		14.5			22.0			12.4			18.0	
Confl. Peds. (#/hr)	2					2						
Peak Hour 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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	4%	0%	6%	4%	0%
Adj. Flow (vph)	98	3	114	9	1	20	45	661	23	17	757	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	98	117	0	0	30	0	45	661	23	17	757	38
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	33.5	33.5		33.5	33.5		27.4	27.4	27.4	27.4	27.4	27.4
Total Split (s)	34.0	34.0		34.0	34.0		86.0	86.0	86.0	86.0	86.0	86.0
Total Split (%)	28.3%	28.3%		28.3%	28.3%		71.7%	71.7%	71.7%	71.7%	71.7%	71.7%
Maximum Green (s)	28.5	28.5		28.5	28.5		80.6	80.6	80.6	80.6	80.6	80.6
Yellow Time (s)	3.6	3.6		3.6	3.6		4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	1.9	1.9		1.9	1.9		1.3	1.3	1.3	1.3	1.3	1.3
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)	5.5	5.5			5.5		5.4	5.4	5.4	5.4	5.4	5.4
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
Recall Mode	None	None		None	None		Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	21.0	21.0		21.0	21.0		15.0	15.0	15.0	15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	13.1	13.1			13.1		83.7	83.7	83.7	83.7	83.7	83.7
Actuated g/C Ratio	0.12	0.12			0.12		0.78	0.78	0.78	0.78	0.78	0.78
v/c Ratio	0.60	0.40			0.15		0.10	0.49	0.02	0.03	0.56	0.03

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	59.2	12.5			23.2		4.2	6.3	1.5	3.8	7.2	2.1
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.2	12.5			23.2		4.2	6.3	1.5	3.8	7.2	2.1
LOS	E	B			C		A	A	A	A	A	A
Approach Delay		33.8			23.2			6.0			6.9	
Approach LOS		C			C			A			A	
Queue Length 50th (m)	19.1	0.6			1.8		1.8	40.0	0.0	0.7	50.3	0.6
Queue Length 95th (m)	35.6	15.8			9.9		5.8	76.5	2.0	2.7	96.4	3.3
Internal Link Dist (m)		177.1			281.1			183.2			276.4	
Turn Bay Length (m)	50.0						140.0			60.0		25.0
Base Capacity (vph)	354	495			401		458	1359	1206	496	1359	1206
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	0.28	0.24			0.07		0.10	0.49	0.02	0.03	0.56	0.03

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 107.7			
Natural Cycle: 75			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 10.0		Intersection LOS: B	
Intersection Capacity Utilization 63.5%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Fallowfield Road & O'Keefe Court/Cobble Hill Drive



Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	178	0	26	32	0	14
Future Vol, veh/h	178	0	26	32	0	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	0
Mvmt Flow	178	0	26	32	0	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	178	0	262	178
Stage 1	-	-	-	-	178	-
Stage 2	-	-	-	-	84	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1410	-	731	870
Stage 1	-	-	-	-	858	-
Stage 2	-	-	-	-	944	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1410	-	717	870
Mov Cap-2 Maneuver	-	-	-	-	717	-
Stage 1	-	-	-	-	858	-
Stage 2	-	-	-	-	926	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.4	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	870	-	-	1410	-
HCM Lane V/C Ratio	0.016	-	-	0.018	-
HCM Control Delay (s)	9.2	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	17	0	736	878	7
Future Vol, veh/h	0	17	0	736	878	7
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	-	-	-	250
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	3	4	0
Mvmt Flow	0	17	0	736	878	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	878	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	350	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	350	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	350	-	-
HCM Lane V/C Ratio	-	0.049	-	-
HCM Control Delay (s)	-	15.8	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0.2	-	-

Future (2023) Total Traffic

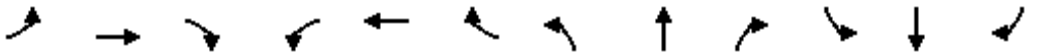
Intersection	
Int Delay, s/veh	7.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	6	32	39	7	42	119	573	9	8	675	88
Future Vol, veh/h	30	6	32	39	7	42	119	573	9	8	675	88
Conflicting Peds, #/hr	0	0	1	1	0	0	1	0	1	1	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	500	-	-	-	-	-	1400	-	0	600	-	250
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	5	3	14	0	0	5	56	12	4	0
Mvmt Flow	30	6	32	39	7	42	119	573	9	8	675	88

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1532	1513	677	1567	1592	574	764	0	0	583	0	0
Stage 1	692	692	-	812	812	-	-	-	-	-	-	-
Stage 2	840	821	-	755	780	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.25	7.13	6.64	6.2	4.1	-	-	4.22	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.64	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.64	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.345	3.527	4.126	3.3	2.2	-	-	2.308	-	-
Pot Cap-1 Maneuver	96	121	448	90	101	522	858	-	-	944	-	-
Stage 1	437	448	-	371	376	-	-	-	-	-	-	-
Stage 2	363	391	-	399	389	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	74	103	447	71	86	521	857	-	-	943	-	-
Mov Cap-2 Maneuver	74	103	-	71	86	-	-	-	-	-	-	-
Stage 1	376	444	-	319	323	-	-	-	-	-	-	-
Stage 2	281	336	-	362	385	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	47.5	85.1	1.7	0.1
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	857	-	-	74	293	124	943	-	-
HCM Lane V/C Ratio	0.139	-	-	0.405	0.13	0.71	0.008	-	-
HCM Control Delay (s)	9.9	-	-	83.5	19.1	85.1	8.8	-	-
HCM Lane LOS	A	-	-	F	C	F	A	-	-
HCM 95th %tile Q(veh)	0.5	-	-	1.6	0.4	3.9	0	-	-

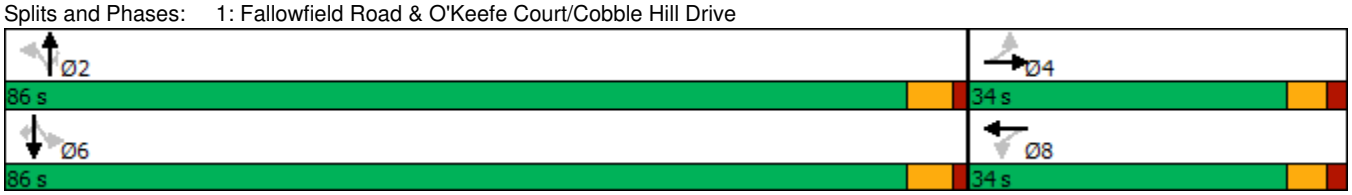


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	6	32	39	7	42	119	573	9	8	675	88
Future Volume (vph)	30	6	32	39	7	42	119	573	9	8	675	88
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	50.0		0.0	0.0		0.0	140.0		0.0	60.0		25.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98			1.00		1.00		0.98	1.00		0.98
Frt		0.874			0.936				0.850			0.850
Flt Protected	0.950				0.978		0.950			0.950		
Satd. Flow (prot)	1729	1498	0	0	1626	0	1729	1733	992	1544	1750	1547
Flt Permitted	0.680				0.839		0.379			0.430		
Satd. Flow (perm)	1238	1498	0	0	1394	0	689	1733	969	698	1750	1512
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		32			36				23			51
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		201.1			305.1			207.2			300.4	
Travel Time (s)		14.5			22.0			12.4			18.0	
Confl. Peds. (#/hr)			1	1			1		1	1		1
Peak Hour 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
Heavy Vehicles (%)	0%	0%	5%	3%	14%	0%	0%	5%	56%	12%	4%	0%
Adj. Flow (vph)	30	6	32	39	7	42	119	573	9	8	675	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	38	0	0	88	0	119	573	9	8	675	88
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	33.5	33.5		33.5	33.5		27.4	27.4	27.4	27.4	27.4	27.4
Total Split (s)	34.0	34.0		34.0	34.0		86.0	86.0	86.0	86.0	86.0	86.0
Total Split (%)	28.3%	28.3%		28.3%	28.3%		71.7%	71.7%	71.7%	71.7%	71.7%	71.7%
Maximum Green (s)	28.5	28.5		28.5	28.5		80.6	80.6	80.6	80.6	80.6	80.6
Yellow Time (s)	3.6	3.6		3.6	3.6		4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	1.9	1.9		1.9	1.9		1.3	1.3	1.3	1.3	1.3	1.3
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)	5.5	5.5			5.5		5.4	5.4	5.4	5.4	5.4	5.4
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
Recall Mode	None	None		None	None		Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	21.0	21.0		21.0	21.0		15.0	15.0	15.0	15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	9.4	9.4			9.4		87.4	87.4	87.4	87.4	87.4	87.4
Actuated g/C Ratio	0.09	0.09			0.09		0.84	0.84	0.84	0.84	0.84	0.84
v/c Ratio	0.27	0.23			0.56		0.21	0.39	0.01	0.01	0.46	0.07

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	48.8	20.5			41.4		3.7	4.0	0.4	2.8	4.5	1.5
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.8	20.5			41.4		3.7	4.0	0.4	2.8	4.5	1.5
LOS	D	C			D		A	A	A	A	A	A
Approach Delay		33.0			41.4			3.9			4.2	
Approach LOS		C			D			A			A	
Queue Length 50th (m)	5.7	1.1			9.9		4.3	25.3	0.0	0.3	32.6	1.1
Queue Length 95th (m)	14.4	10.3			24.7		11.5	49.7	0.5	1.4	63.9	4.7
Internal Link Dist (m)		177.1			281.1			183.2			276.4	
Turn Bay Length (m)	50.0						140.0			60.0		25.0
Base Capacity (vph)	338	432			407		577	1451	815	584	1465	1274
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	0.09	0.09			0.22		0.21	0.39	0.01	0.01	0.46	0.07

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 104.4			
Natural Cycle: 70			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 7.3		Intersection LOS: A	
Intersection Capacity Utilization 70.1%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Fallowfield Road & O'Keefe Court/Cobble Hill Drive



Intersection	
Int Delay, s/veh	1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	31	0	28	173	0	26
Future Vol, veh/h	31	0	28	173	0	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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, %	3	0	0	6	0	0
Mvmt Flow	31	0	28	173	0	26

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	31	0	260	31
Stage 1	-	-	-	-	31	-
Stage 2	-	-	-	-	229	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1595	-	733	1049
Stage 1	-	-	-	-	997	-
Stage 2	-	-	-	-	814	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1595	-	719	1049
Mov Cap-2 Maneuver	-	-	-	-	719	-
Stage 1	-	-	-	-	997	-
Stage 2	-	-	-	-	799	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	8.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1049	-	-	1595	-
HCM Lane V/C Ratio	0.025	-	-	0.018	-
HCM Control Delay (s)	8.5	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	15	0	702	737	13
Future Vol, veh/h	0	15	0	702	737	13
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	-	-	-	250
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	6	4	0
Mvmt Flow	0	15	0	702	737	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	737	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	422	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	422	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	422	-	-
HCM Lane V/C Ratio	-	0.036	-	-
HCM Control Delay (s)	-	13.8	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

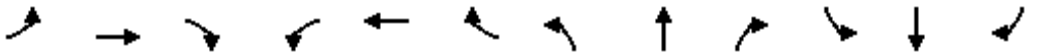
Intersection	
Int Delay, s/veh	11.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	107	3	114	9	1	20	52	504	23	17	689	38
Future Vol, veh/h	107	3	114	9	1	20	52	504	23	17	689	38
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	500	-	-	-	-	-	1400	-	0	600	-	250
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	4	0	6	4	0
Mvmt Flow	107	3	114	9	1	20	52	504	23	17	689	38

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1355	1354	689	1409	1369	506	727	0	0	527	0	0
Stage 1	723	723	-	608	608	-	-	-	-	-	-	-
Stage 2	632	631	-	801	761	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.16	-	-
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	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.254	-	-
Pot Cap-1 Maneuver	128	151	449	117	148	570	886	-	-	1020	-	-
Stage 1	421	434	-	486	489	-	-	-	-	-	-	-
Stage 2	472	477	-	381	417	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	116	140	449	81	137	569	886	-	-	1020	-	-
Mov Cap-2 Maneuver	116	140	-	81	137	-	-	-	-	-	-	-
Stage 1	396	427	-	457	460	-	-	-	-	-	-	-
Stage 2	427	449	-	278	410	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	72.4	26.8	0.8	0.2
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	886	-	-	116	425	195	1020	-	-
HCM Lane V/C Ratio	0.059	-	-	0.922	0.275	0.154	0.017	-	-
HCM Control Delay (s)	9.3	-	-	133.4	16.7	26.8	8.6	-	-
HCM Lane LOS	A	-	-	F	C	D	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	5.8	1.1	0.5	0.1	-	-

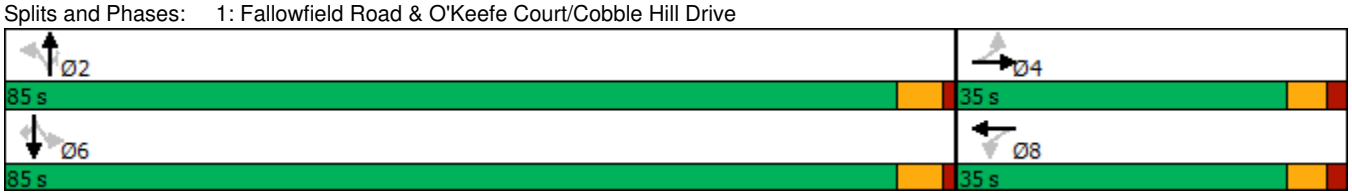


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	3	114	9	1	20	52	504	23	17	689	38
Future Volume (vph)	107	3	114	9	1	20	52	504	23	17	689	38
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	50.0		0.0	0.0		0.0	140.0		0.0	60.0		25.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				0.98							
Frt		0.854			0.910				0.850			0.850
Flt Protected	0.950				0.985		0.950			0.950		
Satd. Flow (prot)	1729	1554	0	0	1605	0	1729	1750	1547	1631	1750	1547
Flt Permitted	0.738				0.898		0.355			0.454		
Satd. Flow (perm)	1338	1554	0	0	1463	0	646	1750	1547	780	1750	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		114			20				23			23
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		201.1			305.1			207.2			300.4	
Travel Time (s)		14.5			22.0			12.4			18.0	
Confl. Peds. (#/hr)	2					2						
Peak Hour 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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	4%	0%	6%	4%	0%
Adj. Flow (vph)	107	3	114	9	1	20	52	504	23	17	689	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	107	117	0	0	30	0	52	504	23	17	689	38
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	33.5	33.5		33.5	33.5		27.4	27.4	27.4	27.4	27.4	27.4
Total Split (s)	35.0	35.0		35.0	35.0		85.0	85.0	85.0	85.0	85.0	85.0
Total Split (%)	29.2%	29.2%		29.2%	29.2%		70.8%	70.8%	70.8%	70.8%	70.8%	70.8%
Maximum Green (s)	29.5	29.5		29.5	29.5		79.6	79.6	79.6	79.6	79.6	79.6
Yellow Time (s)	3.6	3.6		3.6	3.6		4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	1.9	1.9		1.9	1.9		1.3	1.3	1.3	1.3	1.3	1.3
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)	5.5	5.5			5.5		5.4	5.4	5.4	5.4	5.4	5.4
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
Recall Mode	None	None		None	None		Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	21.0	21.0		21.0	21.0		15.0	15.0	15.0	15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	13.8	13.8			13.8		82.6	82.6	82.6	82.6	82.6	82.6
Actuated g/C Ratio	0.13	0.13			0.13		0.77	0.77	0.77	0.77	0.77	0.77
v/c Ratio	0.62	0.39			0.15		0.10	0.37	0.02	0.03	0.51	0.03

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	59.1	12.0			22.6		4.5	5.4	1.7	3.9	6.9	2.2
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.1	12.0			22.6		4.5	5.4	1.7	3.9	6.9	2.2
LOS	E	B			C		A	A	A	A	A	A
Approach Delay		34.5			22.6			5.2			6.6	
Approach LOS		C			C			A			A	
Queue Length 50th (m)	20.7	0.6			1.8		2.2	27.5	0.0	0.7	44.2	0.6
Queue Length 95th (m)	38.1	15.7			9.8		6.8	53.4	2.1	2.8	85.1	3.4
Internal Link Dist (m)		177.1			281.1			183.2			276.4	
Turn Bay Length (m)	50.0						140.0			60.0		25.0
Base Capacity (vph)	368	510			417		497	1346	1195	600	1346	1195
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	0.29	0.23			0.07		0.10	0.37	0.02	0.03	0.51	0.03

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 107.3			
Natural Cycle: 70			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 10.3		Intersection LOS: B	
Intersection Capacity Utilization 67.6%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Fallowfield Road & O'Keefe Court/Cobble Hill Drive



Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	178	0	33	32	0	23
Future Vol, veh/h	178	0	33	32	0	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	0
Mvmt Flow	178	0	33	32	0	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	178	0	276	178
Stage 1	-	-	-	-	178	-
Stage 2	-	-	-	-	98	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1410	-	718	870
Stage 1	-	-	-	-	858	-
Stage 2	-	-	-	-	931	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1410	-	701	870
Mov Cap-2 Maneuver	-	-	-	-	701	-
Stage 1	-	-	-	-	858	-
Stage 2	-	-	-	-	909	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.9	9.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	870	-	-	1410	-
HCM Lane V/C Ratio	0.026	-	-	0.023	-
HCM Control Delay (s)	9.3	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	23	0	582	798	17
Future Vol, veh/h	0	23	0	582	798	17
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	-	-	-	250
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	3	4	0
Mvmt Flow	0	23	0	582	798	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	798	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	389	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	389	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	389	-	-
HCM Lane V/C Ratio	-	0.059	-	-
HCM Control Delay (s)	-	14.8	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.2	-	-

Future (2028) Total Traffic

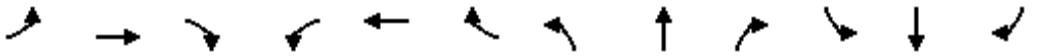
Intersection	
Int Delay, s/veh	15.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	6	32	39	7	42	119	646	9	8	881	88
Future Vol, veh/h	30	6	32	39	7	42	119	646	9	8	881	88
Conflicting Peds, #/hr	0	0	1	1	0	0	1	0	1	1	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	500	-	-	-	-	-	1400	-	0	600	-	250
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	5	3	14	0	0	5	56	12	4	0
Mvmt Flow	30	6	32	39	7	42	119	646	9	8	881	88

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1811	1792	883	1846	1871	647	970	0	0	656	0	0
Stage 1	898	898	-	885	885	-	-	-	-	-	-	-
Stage 2	913	894	-	961	986	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.25	7.13	6.64	6.2	4.1	-	-	4.22	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.13	5.64	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.13	5.64	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.345	3.527	4.126	3.3	2.2	-	-	2.308	-	-
Pot Cap-1 Maneuver	61	82	341	57	67	475	719	-	-	886	-	-
Stage 1	337	361	-	338	347	-	-	-	-	-	-	-
Stage 2	330	362	-	307	311	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	44	68	340	42	55	475	718	-	-	885	-	-
Mov Cap-2 Maneuver	44	68	-	42	55	-	-	-	-	-	-	-
Stage 1	281	357	-	282	289	-	-	-	-	-	-	-
Stage 2	245	302	-	271	308	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	98	242.3	1.7	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	718	-	-	44	208	77	885	-	-
HCM Lane V/C Ratio	0.166	-	-	0.682	0.183	1.143	0.009	-	-
HCM Control Delay (s)	11	-	-	189.1	26.1	242.3	9.1	-	-
HCM Lane LOS	B	-	-	F	D	F	A	-	-
HCM 95th %tile Q(veh)	0.6	-	-	2.6	0.7	6.5	0	-	-

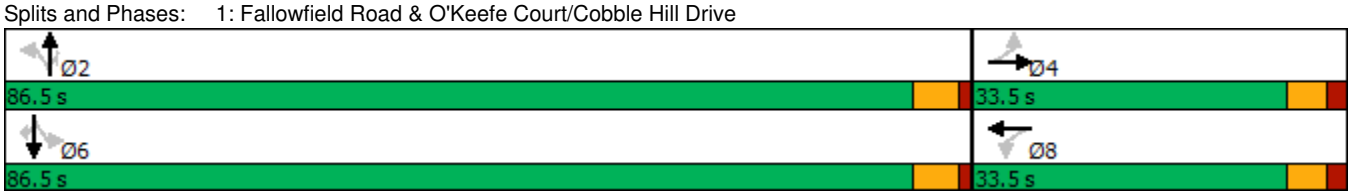


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	6	32	39	7	42	119	646	9	8	881	88
Future Volume (vph)	30	6	32	39	7	42	119	646	9	8	881	88
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	50.0		0.0	0.0		0.0	140.0		0.0	60.0		25.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98			1.00				0.98	1.00		0.98
Frt		0.874			0.936				0.850			0.850
Flt Protected	0.950				0.978		0.950			0.950		
Satd. Flow (prot)	1729	1498	0	0	1626	0	1729	1733	992	1544	1750	1547
Flt Permitted	0.679				0.839		0.286			0.394		
Satd. Flow (perm)	1236	1498	0	0	1394	0	521	1733	969	640	1750	1512
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		32			36				23			40
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		201.1			305.1			207.2			300.4	
Travel Time (s)		14.5			22.0			12.4			18.0	
Confl. Peds. (#/hr)			1	1			1		1	1		1
Peak Hour 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
Heavy Vehicles (%)	0%	0%	5%	3%	14%	0%	0%	5%	56%	12%	4%	0%
Adj. Flow (vph)	30	6	32	39	7	42	119	646	9	8	881	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	38	0	0	88	0	119	646	9	8	881	88
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	33.5	33.5		33.5	33.5		27.4	27.4	27.4	27.4	27.4	27.4
Total Split (s)	33.5	33.5		33.5	33.5		86.5	86.5	86.5	86.5	86.5	86.5
Total Split (%)	27.9%	27.9%		27.9%	27.9%		72.1%	72.1%	72.1%	72.1%	72.1%	72.1%
Maximum Green (s)	28.0	28.0		28.0	28.0		81.1	81.1	81.1	81.1	81.1	81.1
Yellow Time (s)	3.6	3.6		3.6	3.6		4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	1.9	1.9		1.9	1.9		1.3	1.3	1.3	1.3	1.3	1.3
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)	5.5	5.5			5.5		5.4	5.4	5.4	5.4	5.4	5.4
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
Recall Mode	None	None		None	None		Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	21.0	21.0		21.0	21.0		15.0	15.0	15.0	15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	9.4	9.4			9.4		87.9	87.9	87.9	87.9	87.9	87.9
Actuated g/C Ratio	0.09	0.09			0.09		0.84	0.84	0.84	0.84	0.84	0.84
v/c Ratio	0.27	0.23			0.56		0.27	0.44	0.01	0.01	0.60	0.07

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	49.2	20.6			41.6		4.8	4.4	0.4	2.8	6.3	1.7
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.2	20.6			41.6		4.8	4.4	0.4	2.8	6.3	1.7
LOS	D	C			D		A	A	A	A	A	A
Approach Delay		33.2			41.6			4.4			5.8	
Approach LOS		C			D			A			A	
Queue Length 50th (m)	5.7	1.1			10.0		4.6	30.5	0.0	0.3	52.6	1.5
Queue Length 95th (m)	14.3	10.4			24.9		13.3	59.8	0.5	1.4	105.3	5.2
Internal Link Dist (m)		177.1			281.1			183.2			276.4	
Turn Bay Length (m)	50.0						140.0			60.0		25.0
Base Capacity (vph)	330	423			398		436	1452	816	536	1466	1274
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	0.09	0.09			0.22		0.27	0.44	0.01	0.01	0.60	0.07

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 104.9			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 7.9		Intersection LOS: A	
Intersection Capacity Utilization 81.5%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Fallowfield Road & O'Keefe Court/Cobble Hill Drive



Intersection	
Int Delay, s/veh	1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	31	0	28	173	0	26
Future Vol, veh/h	31	0	28	173	0	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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, %	3	0	0	6	0	0
Mvmt Flow	31	0	28	173	0	26

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	31	0	260	31
Stage 1	-	-	-	-	31	-
Stage 2	-	-	-	-	229	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1595	-	733	1049
Stage 1	-	-	-	-	997	-
Stage 2	-	-	-	-	814	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1595	-	719	1049
Mov Cap-2 Maneuver	-	-	-	-	719	-
Stage 1	-	-	-	-	997	-
Stage 2	-	-	-	-	799	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	8.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1049	-	-	1595	-
HCM Lane V/C Ratio	0.025	-	-	0.018	-
HCM Control Delay (s)	8.5	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	15	0	776	949	13
Future Vol, veh/h	0	15	0	776	949	13
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	-	-	-	250
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	6	4	0
Mvmt Flow	0	15	0	776	949	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	949	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	319	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	319	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	319	-	-
HCM Lane V/C Ratio	-	0.047	-	-
HCM Control Delay (s)	-	16.8	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Intersection	
Int Delay, s/veh	21.3

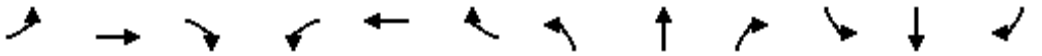
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	107	3	114	9	1	20	52	661	23	17	767	38
Future Vol, veh/h	107	3	114	9	1	20	52	661	23	17	767	38
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	500	-	-	-	-	-	1400	-	0	600	-	250
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	4	0	6	4	0
Mvmt Flow	107	3	114	9	1	20	52	661	23	17	767	38

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1590	1589	767	1644	1604	663	805	0	0	684	0	0
Stage 1	801	801	-	765	765	-	-	-	-	-	-	-
Stage 2	789	788	-	879	839	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.16	-	-
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	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.254	-	-
Pot Cap-1 Maneuver	~ 88	109	405	81	107	465	828	-	-	891	-	-
Stage 1	381	400	-	399	415	-	-	-	-	-	-	-
Stage 2	387	405	-	345	384	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 78	100	405	53	98	464	828	-	-	891	-	-
Mov Cap-2 Maneuver	~ 78	100	-	53	98	-	-	-	-	-	-	-
Stage 1	357	392	-	374	389	-	-	-	-	-	-	-
Stage 2	345	379	-	241	377	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	164.2	39.5	0.7	0.2
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	828	-	-	78	376	134	891	-	-
HCM Lane V/C Ratio	0.063	-	-	1.372	0.311	0.224	0.019	-	-
HCM Control Delay (s)	9.6	-	-	$ 323.2	18.8	39.5	9.1	-	-
HCM Lane LOS	A	-	-	F	C	E	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	8.4	1.3	0.8	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

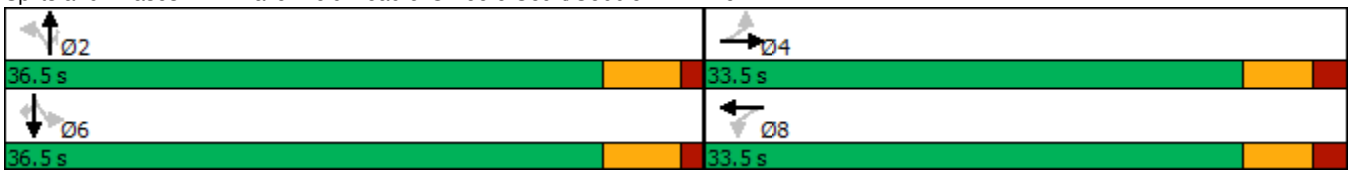


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	3	114	9	1	20	52	661	23	17	767	38
Future Volume (vph)	107	3	114	9	1	20	52	661	23	17	767	38
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	50.0		0.0	0.0		0.0	140.0		0.0	60.0		25.0
Storage Lanes	1		0	0		0	1		1	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				0.99							
Frt		0.854			0.910				0.850			0.850
Flt Protected	0.950				0.985		0.950			0.950		
Satd. Flow (prot)	1729	1554	0	0	1607	0	1729	1750	1547	1631	1750	1547
Flt Permitted	0.738				0.873		0.280			0.346		
Satd. Flow (perm)	1340	1554	0	0	1424	0	510	1750	1547	594	1750	1547
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		111			20				39			39
Link Speed (k/h)		50			50			60			60	
Link Distance (m)		201.1			305.1			207.2			300.4	
Travel Time (s)		14.5			22.0			12.4			18.0	
Confl. Peds. (#/hr)	2					2						
Peak Hour 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
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	4%	0%	6%	4%	0%
Adj. Flow (vph)	107	3	114	9	1	20	52	661	23	17	767	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	107	117	0	0	30	0	52	661	23	17	767	38
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	33.5	33.5		33.5	33.5		27.4	27.4	27.4	27.4	27.4	27.4
Total Split (s)	33.5	33.5		33.5	33.5		36.5	36.5	36.5	36.5	36.5	36.5
Total Split (%)	47.9%	47.9%		47.9%	47.9%		52.1%	52.1%	52.1%	52.1%	52.1%	52.1%
Maximum Green (s)	28.0	28.0		28.0	28.0		31.1	31.1	31.1	31.1	31.1	31.1
Yellow Time (s)	3.6	3.6		3.6	3.6		4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	1.9	1.9		1.9	1.9		1.3	1.3	1.3	1.3	1.3	1.3
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)	5.5	5.5			5.5		5.4	5.4	5.4	5.4	5.4	5.4
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
Recall Mode	None	None		None	None		Max	Max	Max	Max	Max	Max
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	21.0	21.0		21.0	21.0		15.0	15.0	15.0	15.0	15.0	15.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	9.4	9.4			9.4		35.8	35.8	35.8	35.8	35.8	35.8
Actuated g/C Ratio	0.18	0.18			0.18		0.68	0.68	0.68	0.68	0.68	0.68
v/c Ratio	0.45	0.32			0.11		0.15	0.56	0.02	0.04	0.65	0.04

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	24.9	7.5			11.4		6.7	9.0	1.5	5.5	11.4	2.2
Queue Delay	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.9	7.5			11.4		6.7	9.0	1.5	5.5	11.4	2.2
LOS	C	A			B		A	A	A	A	B	A
Approach Delay		15.8			11.4			8.6			10.8	
Approach LOS		B			B			A			B	
Queue Length 50th (m)	8.8	0.5			0.8		1.7	31.9	0.0	0.5	41.0	0.0
Queue Length 95th (m)	20.0	10.3			5.9		6.9	71.7	1.5	2.8	#103.7	2.8
Internal Link Dist (m)		177.1			281.1			183.2			276.4	
Turn Bay Length (m)	50.0						140.0			60.0		25.0
Base Capacity (vph)	713	878			767		346	1188	1063	403	1188	1063
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	0.15	0.13			0.04		0.15	0.56	0.02	0.04	0.65	0.04

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 52.7			
Natural Cycle: 75			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 10.6		Intersection LOS: B	
Intersection Capacity Utilization 67.6%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Fallowfield Road & O'Keefe Court/Cobble Hill Drive



Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	178	0	33	32	0	23
Future Vol, veh/h	178	0	33	32	0	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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	0
Mvmt Flow	178	0	33	32	0	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	178	0	276	178
Stage 1	-	-	-	-	178	-
Stage 2	-	-	-	-	98	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1410	-	718	870
Stage 1	-	-	-	-	858	-
Stage 2	-	-	-	-	931	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1410	-	701	870
Mov Cap-2 Maneuver	-	-	-	-	701	-
Stage 1	-	-	-	-	858	-
Stage 2	-	-	-	-	909	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.9	9.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	870	-	-	1410	-
HCM Lane V/C Ratio	0.026	-	-	0.023	-
HCM Control Delay (s)	9.3	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	23	0	743	878	17
Future Vol, veh/h	0	23	0	743	878	17
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	-	-	-	250
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	3	4	0
Mvmt Flow	0	23	0	743	878	17

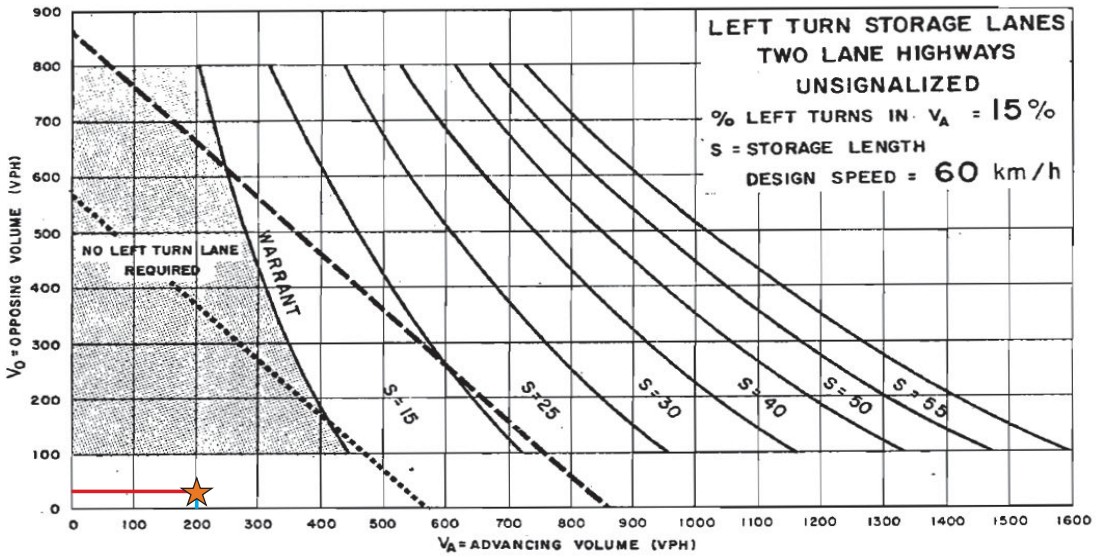
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	878	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	350	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	350	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	350	-	-
HCM Lane V/C Ratio	-	0.066	-	-
HCM Control Delay (s)	-	16	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0.2	-	-

Appendix K – Auxiliary Lane Analyses

O'Keefe Court & Lusk Street - Future (2028) Total Traffic - AM Peak Hour
Westbound Left-turn Lane



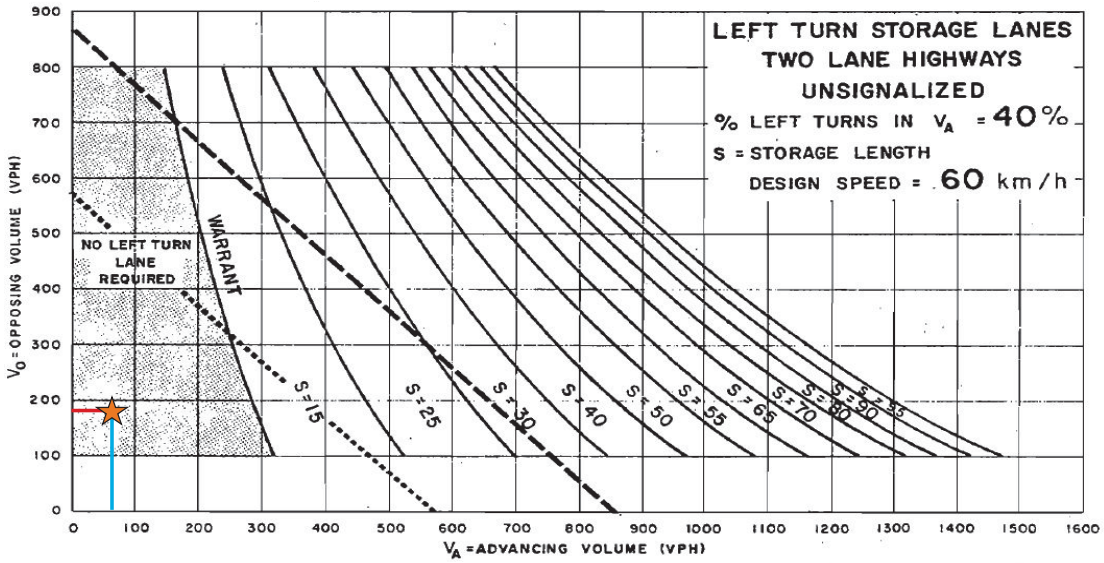
TRAFFIC SIGNALS MAY BE WARRANTED IN RURAL AREAS OR URBAN AREAS WITH RESTRICTED FLOW

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

Opposing Volume

Advancing Volume

O'Keefe Court & Lusk Street - Future (2028) Total Traffic - PM Peak Hour Westbound Left-Turn Lane



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