

4497 O'Keefe Court
Transportation Impact Assessment

Step 1 Screening Report

Step 2 Scoping Report

Step 3 Strategy Report (Revision #2)

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July 2025

PN: 2023-105

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1 Screening

This study has been prepared according to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines, incorporating the 2023 Revision to Transportation Impact Assessment Guidelines. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for the TIA Study PM. As shown in the Screening Form, a TIA is required including the Design Review component and the Network Impact Component. This study has been prepared to support an Official Plan Amendment.

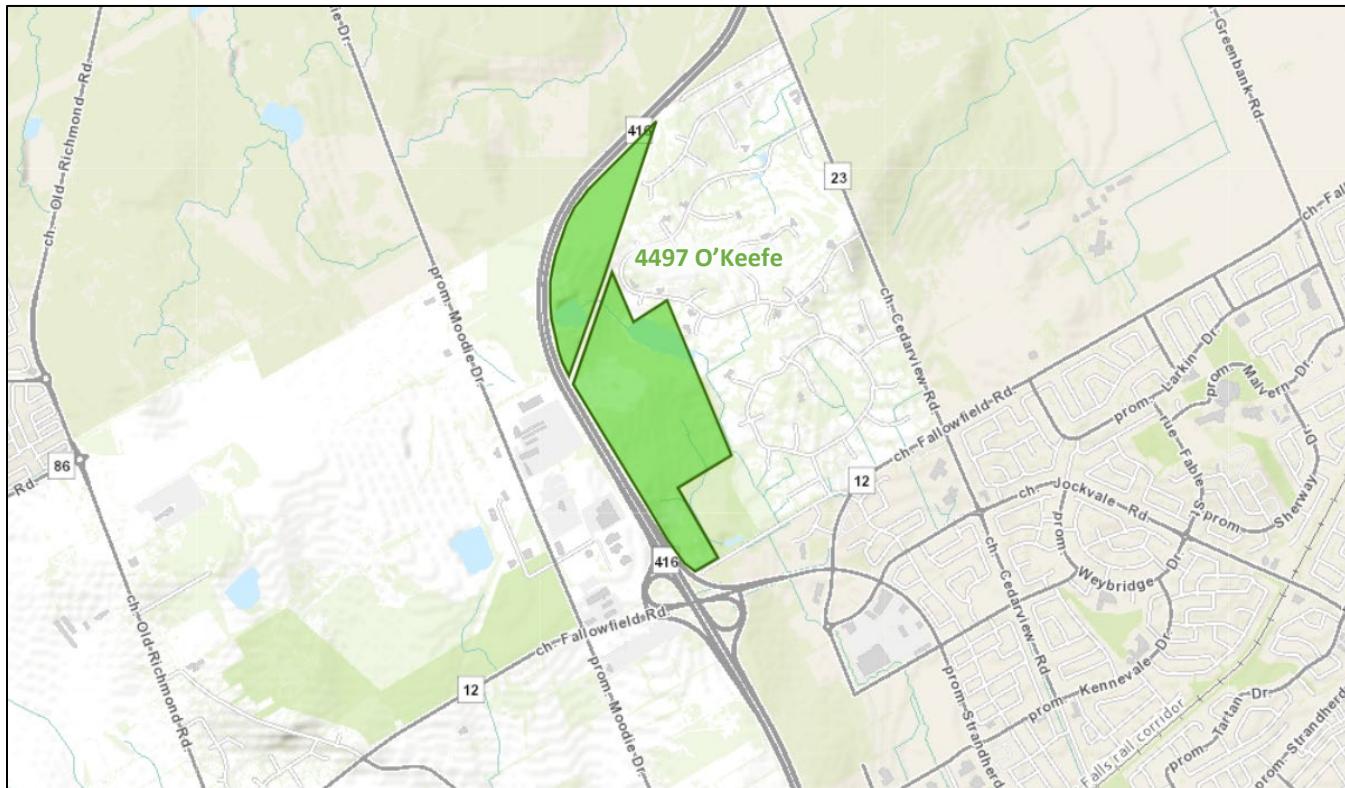
2 Existing and Planned Conditions

2.1 Proposed Development

The development site is located at 4497 O'Keefe Court is currently zoned as Rural Zones (RR4, RR4 [647, 648, 649r]), Open Space and Leisure Zones (O1, O1A), and Environmental Zone (EP3). The development concept is for a new urban community comprising a mix of densities, from detached dwellings to mid-rise condo blocks. Residential-supportive land uses are proposed as being integrated into the community's higher density southern area, where a fifteen-minute community is envisioned. A new collector road serving the community is proposed to connect O'Keefe Court to Onassa Circle.

Figure 1 illustrates the study area context. Figure 2 illustrates the proposed concept plan.

Figure 1: Area Context Plan



Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: May 28, 2024

Figure 2: Concept Plan



2.2 Existing Conditions

2.2.1 Area Road Network

Fallowfield Road: Fallowfield Road is a City of Ottawa arterial road with a four-lane rural cross-section west of Citigate Drive, and a two-lane rural cross-section including paved shoulders north of Strandherd Drive. A multi-use pathway (MUP) is provided on the west side of the road between O'Keefe Court and Forager Street, with an off-road MUP continuing from O'Keefe Court to Cedarview Road on the north side of Fallowfield Road. The posted speed limit is 60 km/h north of Strandherd Drive and 80 km/h west of Citigate Drive. The Ottawa Official Plan reserves a 44.5 metre right-of-way north of Strandherd Drive within the study area and the measured right-of-way is 48.0 metres west of Citigate Drive. Fallowfield Road is designated as a truck route.

Strandherd Drive: Strandherd Drive is a City of Ottawa arterial road with a four-lane, divided urban cross-section including cycletracks and sidewalks on both sides of the road. The posted speed limit is 80 km/h and the Ottawa Official Plan reserves a 44.5 metre right of way within the study area. Strandherd Drive is designated as a truck route.

Cedarview Road: Cedarview Road is a City of Ottawa arterial road north of Fallowfield Road, a major collector road between Fallowfield Road and Jockvale Road, a collector road south of Jockvale Road and a local road south of Kennevale Road. Cedarview Road has a two-lane rural cross-section, with paved shoulders north of Fallowfield Drive, and gravel shoulders to the south. South of Fallowfield Road, a MUP is provided on the east side of the road. The posted speed limit is 60 km/h north of Fallowfield Road and 40 km/h south of Fallowfield Road. The Ottawa Official Plan reserves a 37.5 metre right of way north of Fallowfield Road, a 26.0 metre right of way between Fallowfield Road and Jockvale Road, and a 24.0 metre right of way south of Jockvale Road. Cedarview Road is designated as a truck route north of Fallowfield Road.

Citigate Drive: Citigate Drive is a City of Ottawa major collector road with a two-lane urban cross-section. A sidewalk is provided along the west side of the road and a MUP is provided on the east side of the road South of CrossKeys Place. The unposted speed limit is assumed to be 50 km/h and the existing right of way is 24.0 metres north of CrossKeys Place, and 26.0 metres south of CrossKeys Place.

O'Keefe Court: O'Keefe Court is a City of Ottawa local road with a two-lane rural cross-section including gravel shoulders. An off-road MUP is provided on the north side of O'Keefe Court between Fallowfield Road and Lytle Park. The unposted speed limit is assumed to be 50 km/h and the existing right of way varies between 30.0 metres and 31.0 metres within the study area.

Cobble Hill Drive: Cobble Hill Drive is a City of Ottawa local road with a two-lane urban cross-section. Sidewalks are provided on both sides of the road. The unposted speed limit is assumed to be 50 km/h and the existing right of way is 21.5 metres.

Onassa Circle: Onassa Circle is a City of Ottawa local road with a two-lane rural cross-section. The posted speed limit is 40 km/h and the existing right of way is 20.0 metres.

2.2.2 Existing Intersections

The key study area intersections have been summarized below:

Cedarview Road at Onassa Circle

The intersection of Cedarview Road at Onassa Circle is an unsignalized T-intersection with stop control on the minor approach of Onassa Circle. The northbound approach consists of a shared left-turn/through lane, and the southbound approach consists of a shared through/right-turn lane. The eastbound approach consists of a shared

all-movements lane which is separated from the receiving lane on this leg by a median. No turn restrictions were noted.

Fallowfield Road/Citigate Drive at Strandherd Drive

The intersection of Fallowfield Road/Citigate Drive at Strandherd Drive is a signalized intersection. The northbound approach of Citigate Drive consists of two auxiliary left-turn lanes and a shared through/right-turn lane, and the southbound approach of Fallowfield Road consists of an auxiliary left-turn lane, a through lane, and an auxiliary channelized right-turn lane. The eastbound approach of Fallowfield Road consists of two auxiliary left-turn lanes, two through lanes, an auxiliary right-turn lane, and a cycletrack, and the westbound approach of Strandherd Drive consists of an auxiliary left-turn lane, two through lanes, an auxiliary right-turn lane, and a cycletrack. No turn restrictions were noted.

Fallowfield Road at O'Keefe Court/Cobble Hill Drive

The intersection of Fallowfield Road at O'Keefe Court/Cobble Hill Drive is an unsignalized intersection with stop control on the minor approaches of O'Keefe Court and Cobble Hill Drive. The northbound approach, considered as Cobble Hill Drive within this TIA consists of a shared all-movements lane and the southbound approach of O'Keefe Court consists of an auxiliary left-turn lane and a shared through/right-turn lane. The eastbound approach of Fallowfield Road consists of an auxiliary left-turn lane, a through lane, and a right-turn lane, and the westbound approach of Fallowfield Road consists of an auxiliary left-turn lane, a through lane, a pocket bike lane, and an auxiliary right-turn lane. No turn restrictions were noted.

Fallowfield Road at Cedarview Road

The intersection of Fallowfield Road at Cedarview Road is a signalized intersection. The northbound approach consists of an auxiliary left-turn lane, a through lane, and an auxiliary right-turn lane, and the southbound approach consists of an auxiliary left-turn lane and a shared through/right-turn lane. The eastbound and westbound approaches each consist of an auxiliary left-turn lane, a through lane, and an auxiliary right-turn lane. No turn restrictions were noted.

2.2.3 Existing Driveways

Within 200 metres of the proposed site accesses, driveways to four detached dwellings are present on Trilby Court. Just beyond 200 metres from the proposed connection to O'Keefe Court, a driveway to Lytle Park is present.

2.2.4 Cycling and Pedestrian Facilities

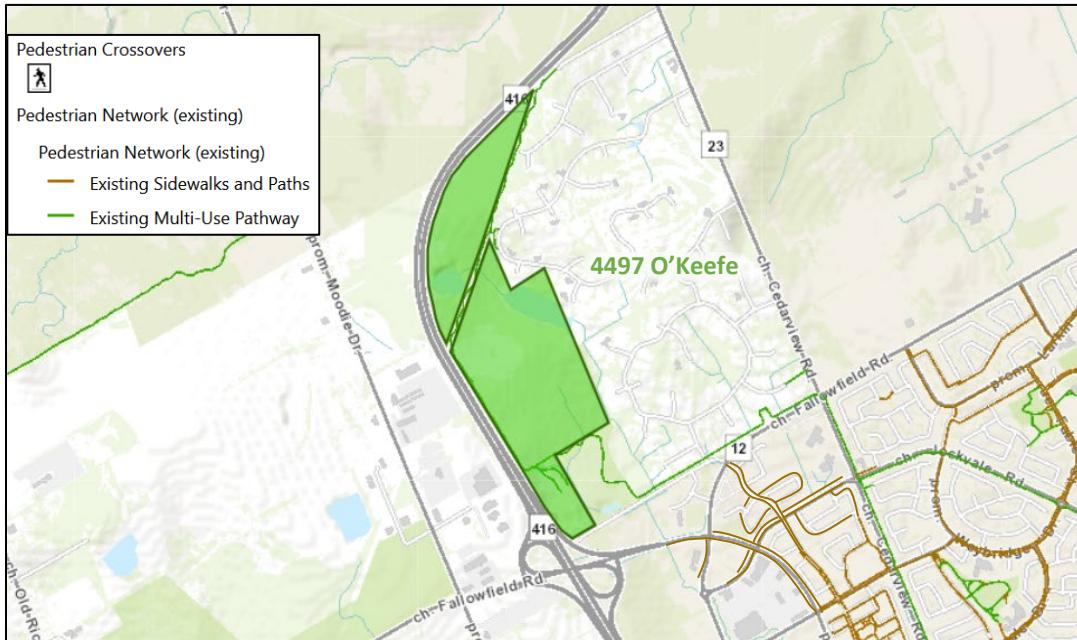
Figure 3 illustrates the pedestrian facilities in the study area and Figure 4 illustrates the cycling facilities.

Sidewalks are provided along both sides of Strandherd Drive and Cobble Hill Drive, and along the west side of Citigate Drive. A sidewalk is provided on the south side of Fallowfield Road for approximately 155 metres west of Citigate Drive.

Cycling facilities include cycletracks along both sides of Strandherd Drive, and a cycletrack on the south side of Fallowfield Road for approximately 155 metres west of Citigate Drive. Paved shoulders are provided along Fallowfield Road north of Strandherd Drive and Cedarview Road north of Fallowfield Road within the study area. A MUP is present along the east side of Cedarview Road south of Fallowfield Road and on the east side of Citigate

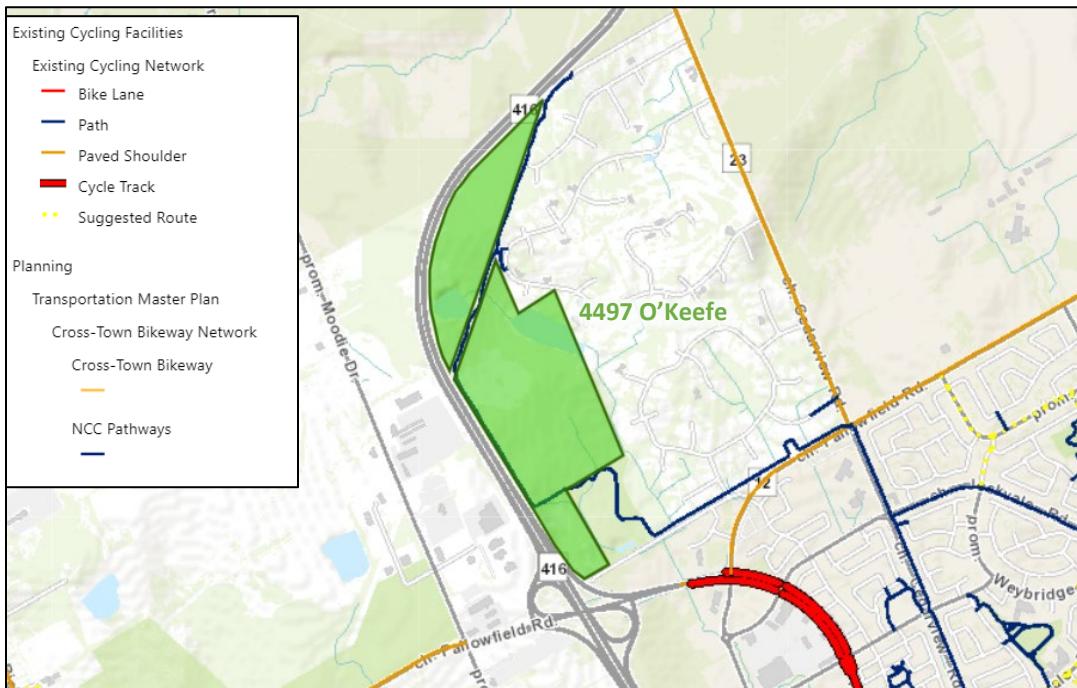
Drive south of CrossKeys Place. An off-road MUP also exists on the north side of Fallowfield Road west of Cedarview Road, continuing along O'Keefe Court to Lytle Park. This MUP circulates Lytle Park and continues as a gravel pathway is along the western edge of the 4497 O'Keefe Court parcel and along the hydro corridor to connect to Lytle Avenue. Strandherd Drive is designated as a cross-town bikeway.

Figure 3: Study Area Pedestrian Facilities



Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: May 28, 2024

Figure 4: Study Area Cycling Facilities



Source: <http://maps.ottawa.ca/geoOttawa/> Accessed: May 28, 2024

Pedestrian and cyclist volumes included in study area intersection counts, presented in Section 2.2.7, have been compiled and are illustrated in Figure 5 and Figure 6, respectively.

Figure 5: Existing Pedestrian Volumes

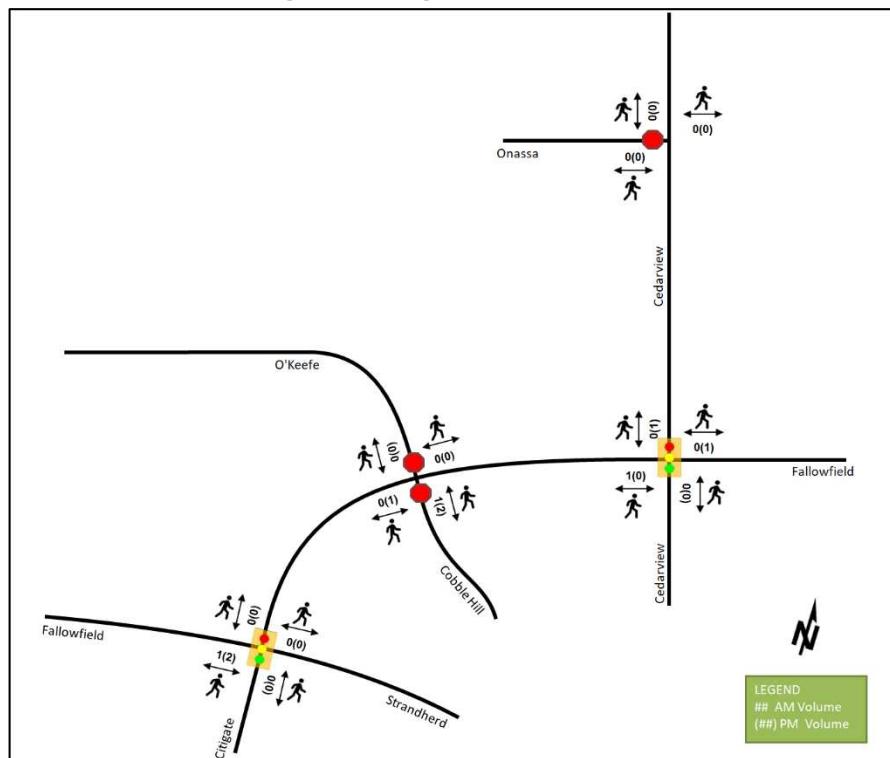
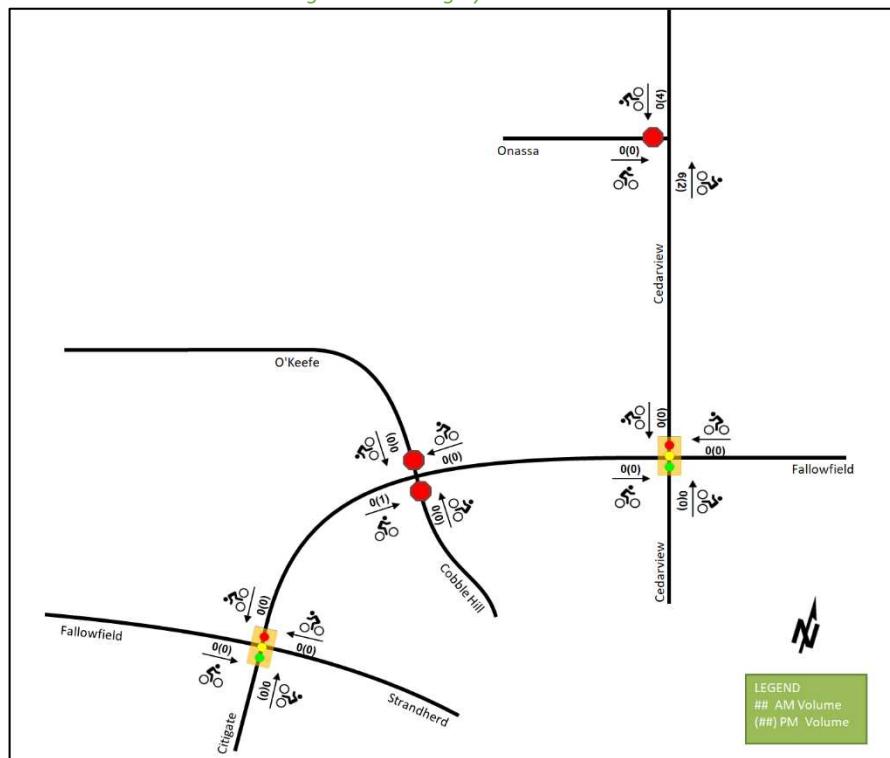


Figure 6: Existing Cyclist Volumes



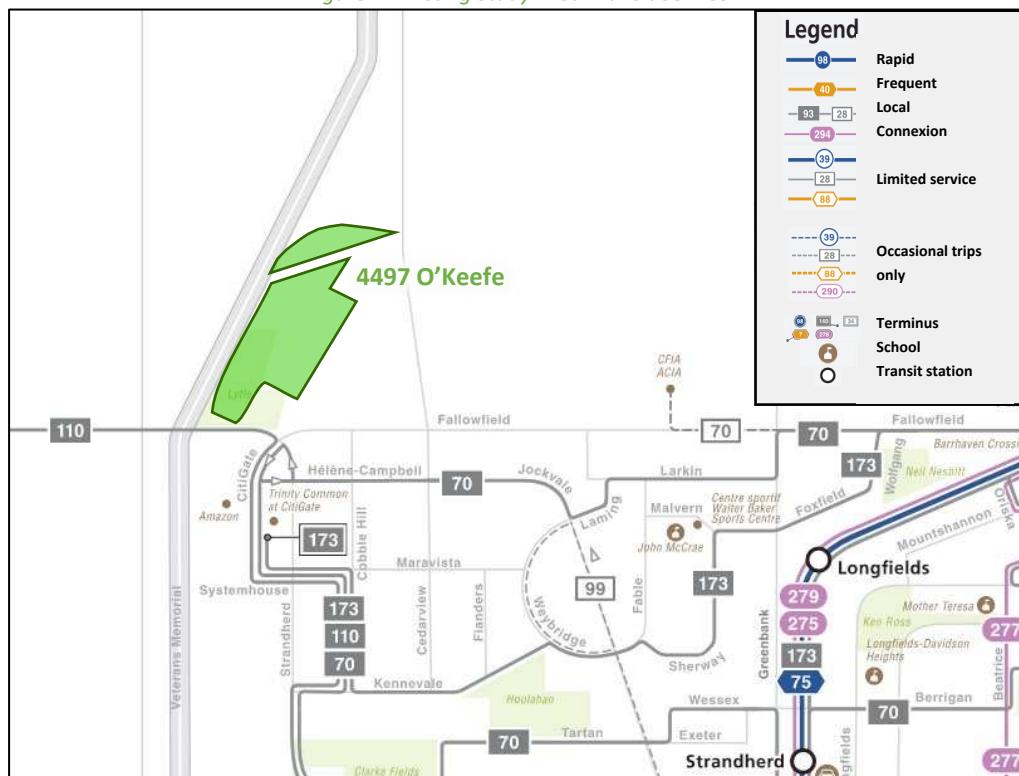
2.2.5 Existing Transit

Figure 7 illustrates the transit system map in the study area and Figure 8 illustrates the transit stops within one kilometre from the centroid of the site. All transit information is from July 4, 2025 and is included for general information purposes and context to the surrounding area.

Within the study area, the route #110 travels along Fallowfield Road to Citigate Drive, the route #70 travels along Helene-Campbell Road and Citigate Drive, and the route #173 travels along Citigate Drive and Systemhouse Street/Maravista Drive. None of these routes presently stop within walking distance of the proposed development. The frequency of these routes based on July 4, 2025 service levels are:

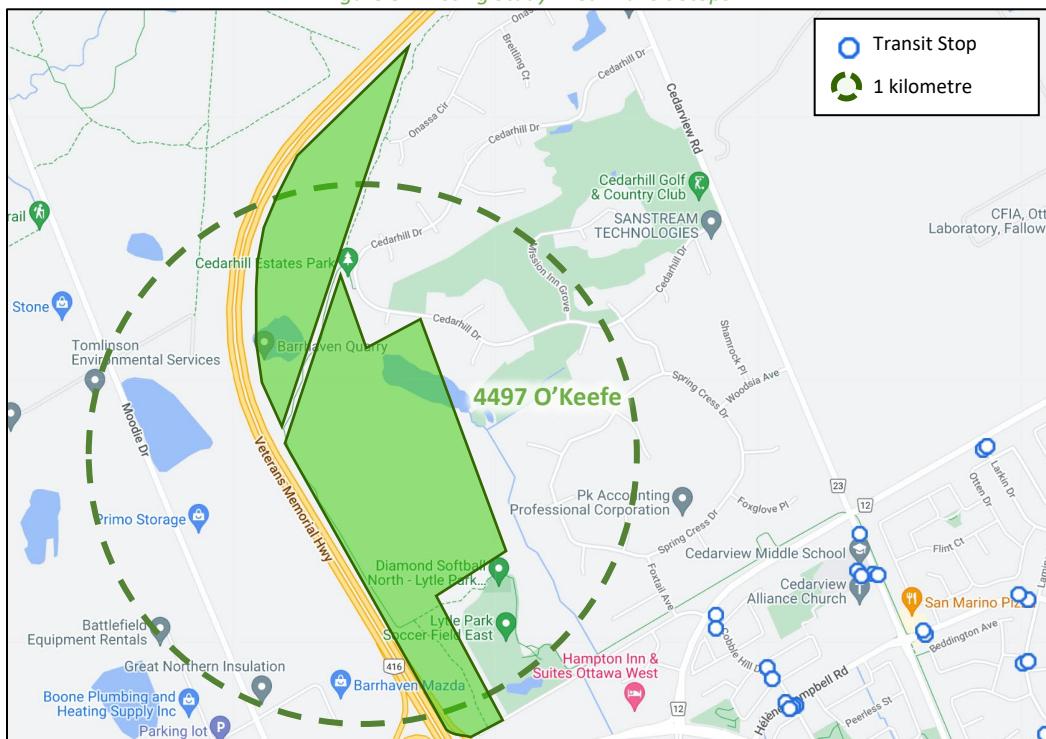
- Route # 70 – 15-minute service in the peak period/direction, 30-minute service all-day
- Route # 110 – 30-minute service all-day
- Route # 173 – 30-minute service all-day

Figure 7: Existing Study Area Transit Service



Source: <http://www.octranspo.com/> Accessed: July 4, 2025

Figure 8: Existing Study Area Transit Stops



Source: <http://www.octranspo.com/> Accessed: July 4, 2025

2.2.6 Existing Area Traffic Management Measures

There are no existing area traffic management measures within the study area.

2.2.7 Existing Peak Hour Travel Demand

Existing turning movement counts were acquired from the City of Ottawa and Accu-Traffic Inc. for the existing study area intersections. Table 1 summarizes the intersection count dates.

Table 1: Intersection Count Date

Intersection	Count Date	Source
Cedarview Road at Onassa Circle	Wednesday, July 18, 2023	Accu-Traffic Inc.
Fallowfield Road at Cedarview Road	Tuesday, January 7, 2020	City of Ottawa
Fallowfield Road at O'Keefe Court/ Cobble Hill Drive	Wednesday, June 7, 2020	City of Ottawa
Fallowfield Road/Citigate Drive at Strandherd Drive	Wednesday, July 18, 2023	Accu-Traffic Inc.

Figure 9 illustrates the existing traffic counts and Table 2 summarizes the existing intersection operations. The level of service for signalized intersections is based on volume to capacity ratio (v/c) calculations for individual lane movements and MMLOS Guidelines weighted v/c methodology for the overall intersection, per direction from Transportation Engineering Services, and average delay for unsignalized intersections. Detailed turning movement count data is included in Appendix B and the Synchro worksheets are provided in Appendix C.

Figure 9: Existing Traffic Counts

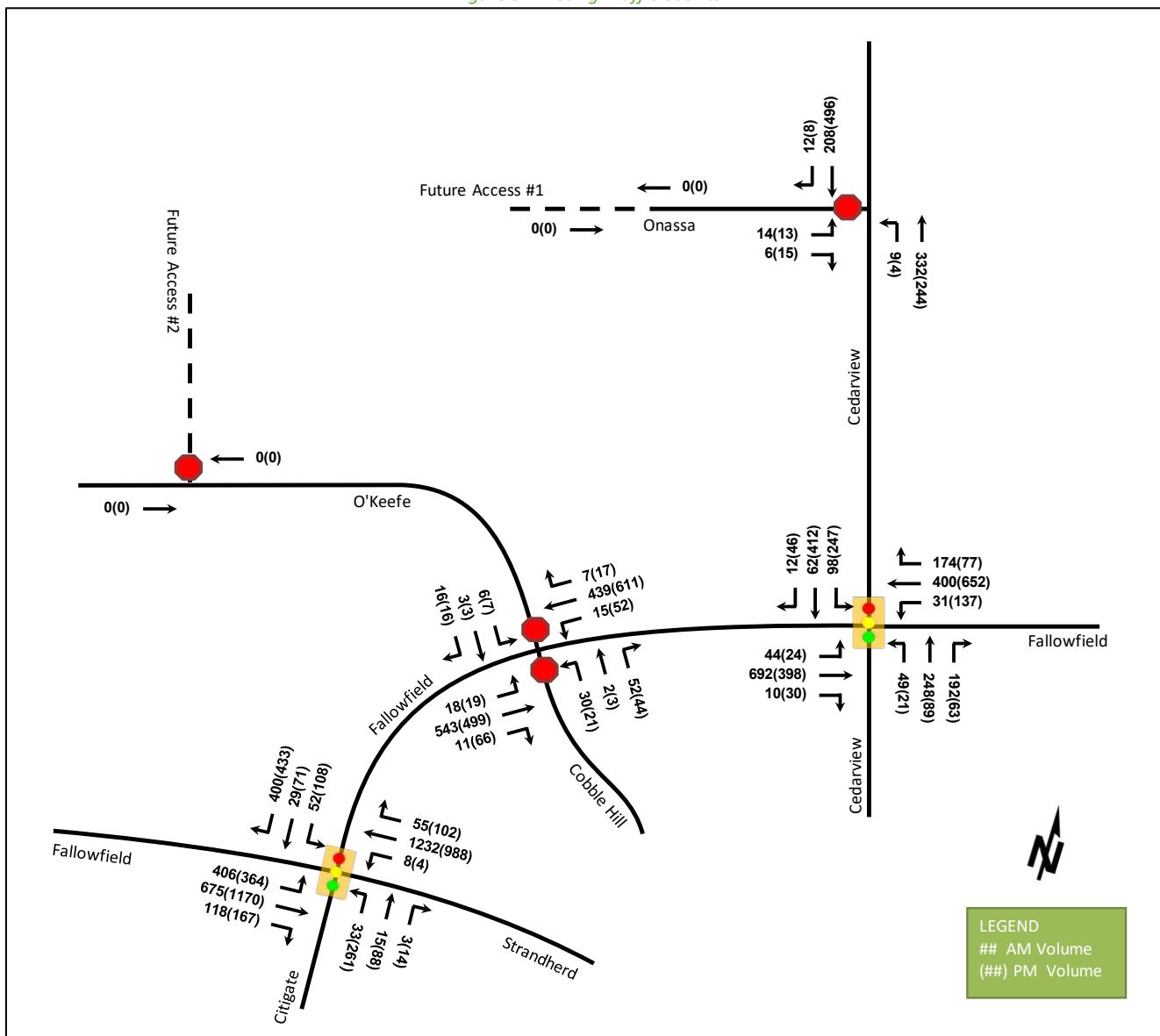


Table 2: Existing Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Cedarview Road at Onassa Circle Unsignalized	EBL/R	B	0.05	12.6	0.8	B	0.08	14.5	1.5
	NBL/T	A	0.01	7.9	0.0	A	0.00	8.6	0.0
	SBT/R	-	-	-	-	-	-	-	-
	Overall	A	-	0.6	-	A	-	0.6	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay (s)	Q (95 th)	LOS	V/C	Delay (s)	Q (95 th)
Fallowfield Road/Citigate Drive at Strandherd Drive <i>Signalized</i>	EBL	C	0.77	54.7	66.7	D	0.81	62.4	#75.9
	EBT	A	0.36	11.9	84.5	D	0.86	36.9	#246.5
	EBR	A	0.12	1.6	6.2	A	0.25	6.8	21.4
	WBL	A	0.12	57.2	7.3	A	0.07	56.2	4.6
	WBT	F	1.07	81.7	#295.0	F	1.24	155.3	#227.6
	WBR	A	0.08	0.2	0.0	A	0.22	2.8	5.3
	NBL	A	0.22	56.5	9.7	A	0.52	50.3	#60.3
	NBT/R	A	0.13	47.9	11.6	A	0.58	59.0	41.2
	SBL	A	0.22	44.5	22.8	A	0.31	40.3	39.7
	SBT	A	0.16	45.4	14.4	A	0.28	42.2	25.7
	SBR	D	0.83	20.9	41.8	D	0.88	29.8	63.4
	Overall	E	0.99	48.3	-	F	1.03	69.0	-
Fallowfield Road at O'Keefe Court/ Cobble Hill Drive <i>Unsignalized</i>	EBL	A	0.02	8.6	0.8	A	0.03	9.3	0.8
	EBT	-	-	-	-	-	-	-	-
	EBR	-	-	-	-	-	-	-	-
	WBL	A	0.02	8.9	0.8	A	0.06	9.0	1.5
	WBT	-	-	-	-	-	-	-	-
	WBR	-	-	-	-	-	-	-	-
	NB	D	0.35	25.3	11.3	D	0.38	33.5	12.0
	SBL	E	0.06	37.0	1.5	E	0.09	48.8	2.3
	SBT/R	B	0.06	14.9	1.5	C	0.07	17.7	1.5
	Overall	A	-	2.6	-	A	-	2.7	-
Fallowfield Road at Cedarview Road <i>Signalized</i>	EBL	A	0.10	9.0	9.3	A	0.15	14.9	7.6
	EBT	C	0.73	18.4	#172.1	A	0.49	16.6	72.8
	EBR	A	0.01	0.0	0.0	A	0.04	2.4	2.9
	WBL	A	0.14	10.6	7.8	A	0.40	17.8	31.3
	WBT	A	0.42	11.0	65.9	D	0.82	28.0	#168.1
	WBR	A	0.20	2.0	8.9	A	0.11	3.7	7.3
	NBL	A	0.20	26.2	14.8	A	0.21	24.8	8.6
	NBT	C	0.71	39.7	59.6	A	0.17	20.2	21.3
	NBR	A	0.49	14.4	26.4	A	0.13	5.7	8.0
	SBL	B	0.65	47.2	30.3	B	0.69	34.3	63.0
	SBT/R	A	0.22	22.6	18.3	D	0.89	46.5	#125.9
	Overall	C	0.72	19.1	-	D	0.85	27.5	-

Notes: Saturation flow rate of 1800 veh/h/lane

Delay = average vehicle delay in seconds

Queue is measured in metres

m = metered queue

Peak Hour Factor = 0.90

= volume for the 95th %ile cycle exceeds capacity

At the intersection of Fallowfield Road/Citigate Drive at Strandherd Drive, during the AM peak hour, the westbound through movement is over theoretical capacity and may be subject to high delays and extended queues. During the PM peak hour at this intersection, the westbound through movement is over theoretical capacity and may be subject to high delays and extended queues, and extended queues may be observed on the eastbound left, eastbound through, and northbound left movements. Movements over capacity on the eastbound and westbound approaches are influenced by the phase lengths for the northbound and southbound through movements within the cycle, which include long pedestrian crossings. Therefore, limited opportunities to reallocate split are present.

At the intersection of Fallowfield Road at Cedarview Road, extended queues may be observed on the eastbound through movement during the AM peak hour, and on the westbound through and southbound through/right movements during the PM peak hour.

The intersection of Fallowfield Road at O'Keefe Court/Cobble Hill Drive is understood be under monitoring by City staff for signal implementation. A signal warrant analysis was performed for the intersection of Fallowfield Road at O'Keefe Court/ Cobble Hill Drive for the existing conditions, which was found not to meet warrants. Signal warrants are provided in Appendix D.

2.2.8 Collision Analysis

Collision data have been acquired from the City of Ottawa open data website (data.ottawa.ca) for five years prior to the commencement of this TIA for the surrounding study area road network. Table 3 summarizes the collision types and conditions in the study area, Figure 10 illustrates the area collisions, and Table 4 summarizes the total collisions for each of the locations analyzed. Collision data are included in Appendix E.

Table 3: Study Area Collision Summary, 2018-2022

		Number	%
Total Collisions		74	100%
Classification	Fatality	0	0%
	Non-Fatal Injury	15	20%
	Property Damage Only	59	80%
Initial Impact Type	Angle	7	9%
	Rear end	39	53%
	Sideswipe	7	9%
	Turning Movement	9	12%
	SMV Other	11	15%
	Other	1	1%
Road Surface Condition	Dry	52	70%
	Wet	12	16%
	Loose Snow	5	7%
	Slush	2	3%
	Packed Snow	2	3%
	Ice	1	1%
Pedestrian Involved		0	0%
Cyclists Involved		0	0%

Figure 10: Study Area Collision Records, 2018-2022



Table 4: Summary of Collision Locations, 2018-2022

Intersections / Segments	Number	%
Intersections / Segments	74	100%
Fallowfield Road at Strandherd Drive	42	57%
Fallowfield Road at Cedarview Road	21	28%
Cedarview Road between Fallowfield Road and Woodsia Avenue	4	5%
Fallowfield Road at O'Keefe Court/Cobble Hill Drive	3	4%
Fallowfield Road between Cedarview Road and O'Keefe Court	2	3%
O'Keefe Court between Foxtail Avenue and End	1	1%
Cedarview Road between Cedarhill Drive and Lytle Avenue	1	1%

Within the study area, the intersections of Fallowfield Road at Strandherd Drive and Fallowfield Road at Cedarview Road are noted to have experienced higher collisions than other locations. Table 5 and Table 6 summarize the collision types and conditions for each of the locations.

Table 5: Fallowfield Road at Strandherd Drive Collision Summary

		Number	%
Total Collisions		42	100%
Classification	Fatality	0	0%
	Non-Fatal Injury	7	17%
	Property Damage Only	35	83%
Initial Impact Type	Angle	4	10%
	Rear end	27	64%
	Sideswipe	6	14%
	Turning Movement	2	5%
	SMV Other	3	7%
Road Surface Condition	Dry	29	69%
	Wet	5	12%
	Loose Snow	4	10%
	Slush	2	5%
	Packed Snow	1	2%
	Ice	1	2%
Pedestrian Involved		0	0%
Cyclists Involved		0	0%

The Fallowfield Road at Strandherd Drive intersection had a total of 42 collisions during the 2018-2022 time period, with 35 involving property damage only and the remaining seven having non-fatal injuries. The collision types are most represented by rear end 27 with collisions, followed by six sideswipe collisions, four angle collisions, three SMV other collisions, and the remaining two turning movement collisions. Rear end and sideswipe collisions are typically associated with congestion, and no other patterns are noted. Weather conditions do not affect collisions at this location. No further review of collisions at this location is required as part of this study.

Table 6: Fallowfield Road at Cedarview Road Collision Summary

		Number	%
Total Collisions		21	100%
Classification	Fatality	0	0%
	Non-Fatal Injury	4	19%
	Property Damage Only	17	81%
Initial Impact Type	Angle	3	14%
	Rear end	10	48%
	Sideswipe	1	5%
	Turning Movement	6	29%
	Other	1	5%
Road Surface Condition	Dry	15	71%
	Wet	5	24%
	Loose Snow	1	5%
Pedestrian Involved		0	0%
Cyclists Involved		0	0%

The Fallowfield Road at Cedarview Road intersection had a total of 21 collisions during the 2018-2022 time period, with 17 involving property damage only and the remaining four having non-fatal injuries. The collision types are most represented by rear end with ten collisions, followed by six turning movement collisions, three angle collisions, and one collision each for sideswipe and other type collisions. As previously stated, rear end collisions are typically associated with congestion. Five of the six turning movement collisions were recorded in 2018, with

one recorded in 2019 and none recorded in the following three years. Weather conditions do not affect collisions at this location and no further examination is required as part of this study.

2.3 Planned Conditions

2.3.1 Changes to the Area Transportation Network

2.3.1.1 *Transportation Master Plan (2025)*

The recently approved Transportation Master Plan includes a Capital Infrastructure Plan identifying transportation investments to support the forecasted growth and strategic connectivity and livability targets for the City. It also identifies committed projects, and a subset of priority projects that are expected to be implemented by 2046 based on current affordability assumptions. Area projects anticipated to impact travel in the study area that are included within the Capital Infrastructure Plan are:

- Active Transportation Network
 - Priority
 - Fallowfield Road - Forager Street Pathway – the continuation of the MUP from Forager Street to the intersection of Fallowfield Road at Strandherd Drive
- Transit Network
 - Priority
 - Barrhaven LRT – the replacement of the BRT line from Baseline Station to Barrhaven Centre Station with a new LRT line
 - Greenbank Re-Alignment BRT – a new BRT corridor from Barrhaven Centre Station along a re-aligned Greenbank Road south to Kilbirnie Drive
 - Needs-Based
 - Chapman Mills Drive BRT Extension and Conceptual Future Corridor – the extension of the BRT corridor from Barrhaven Centre Station to Borrisokane Road, with a future conceptual corridor extending west to Highway 416
- Road Network
 - Committed Projects
 - Greenbank Road Re-Alignment (Chapman Mills Drive to Cambrian Road)
 - Priority
 - Greenbank Road Re-Alignment (Cambrian Road to Kilbirnie Drive) – two lane road between Cambrian Road and Kilbirnie Drive
 - Greenbank Road Re-Alignment (Kilbirnie Drive to Barnsdale Road) – two lane road between Kilbirnie Drive and Barnsdale Road
 - Fallowfield Road Urbanization (Greenbank Road to Strandherd Drive) – anticipated to include a MUP on the south side of the cross-section
 - Highway 416 Interchange at Barnsdale Road (delivered by Province)
 - Needs-Based
 - Fallowfield Road Widening (Old Richmond Road to Moodie Drive) – widening the section of the corridor from two to four lanes
 - Barnsdale Road Widening (Highway 416 to Greenbank Road Extension) – widening from two to four lanes

2.3.1.2 *Signalization of Fallowfield Road at O'Keefe Court/Cobble Hill Drive*

The intersection of Fallowfield Road at O'Keefe Court/Cobble Hill Drive is planned for signalization in the future based on monitoring by the City. No additional modifications beyond the intersection control are understood to be planned at this time. It is anticipated that once warrants are met, this modification will be undertaken by the City.

2.3.1.3 *Barnsdale Interchange*

The environmental assessment study and preliminary design for an interchange at the intersection of Highway 416 and Barnsdale Road was completed in September 2023. The ultimate configuration is a partial cloverleaf interchange on the south side of Barnsdale Road, a 4-lane bridge over Highway 416. The interim configurations will be subject to traffic demands and it is expected that the free flow ramps on the north side of Barnsdale Road will not be constructed as part of this configuration and are a long-term improvement once warranted. The new interchange will be an effective highway access point for most residents and businesses in Barrhaven South, and reduce demands associated with the Fallowfield interchange. The interim buildout horizon for the new facility is understood to be 2029.

2.3.2 Other Study Area Developments

115 Lusk Street

The proposed development application includes a site plan to construct a 3,014 sq. ft restaurant and a 6,103 sq. ft medical office. The development was forecast to be built out in 2023, though is yet to be constructed, and to generate 13 new AM and 32 new PM peak hour two-way auto trips. (IBI Group, 2021)

135 Lusk Street

The proposed development application includes a site plan to construct a 99 rooms hotel. The development was forecast to be built out in 2023, though is yet to be constructed, and to generate 42 new AM and 53 new PM peak hour two-way auto trips. (IBI Group, 2021)

140 Lusk Street

The proposed development application includes a site plan to construct a hotel with 88 rooms. The development was forecast to be built out in 2023, though is yet to be constructed, and to generate 36 new AM and 45 new PM two-way peak-hour auto trips. (IBI Group, 2022)

4451 Fallowfield Road

The proposed development application includes a site plan to construct a self-storage facility with shared office space and ground floor retail space. The development is forecast to be built out in 2025 and to generate 98 AM and 85 PM peak hour two-way auto trips. (CGH, 2023)

2740 Cedarview Road, 4190-4236 Fallowfield Road

The proposed development application includes plan of subdivision to include six (6) four-storey apartment buildings comprising a total of 108 units, three (3) four-storey back-to-back terrace homes comprising 48 units, and two (2) three-storey stacked townhomes comprising a total of 24 units, and one terrace home comprising eight units. No TIA was available for this development.

444 Citigate Drive, 560 Dealership Drive

The proposed development application includes zoning by-law amendment and plan of subdivision to construct six industrial/warehouse buildings for a total of 1,174,800. A traffic memo supporting the plan of subdivision application states that forecasted auto trips for the development area will be 623 two-way AM and 548 two-way

PM peak hour trips, and that the forecasted person trips for the development will be 780 fewer AM and 880 fewer PM peak hour two-way person trips than forecast within the CTS for the development area. (Novatech, 2022)

4433 Strandherd Drive

The proposed development application includes a site plan to construct a new 99 room, 5 storey hotel, providing 5,413 sq. m of GFA. The development was initially forecast to be built out in 2020 to generate 48 new AM and 53 new PM peak hour two-way auto trips, it is currently under construction and is anticipated to be occupied in 2024. (Novatech, 2018)

Citigate Employment Lands

The overall development application for the Citigate Employment lands included a shopping centre with 350,000 sq. ft of gross floor area (GFA), a hotel, 16.56 hectares of Business Park, 67.65 hectares of Prestige Business Park, and 10.5 hectares of car dealerships. It is noted that dealerships on the east south corner, Amazon, and retail stores on the north side have been constructed and captured in the existing counts. Approximately half completed, the entire development area was initially forecast to be built out in 2029 and to generate approximately 4100 new AM and 4400 new PM peak hour two-way auto trips. (Novatech, 2012)

3 Study Area and Time Periods

3.1 Study Area

The study area will include the intersections of:

- Fallowfield Road at:
 - Cedarview Road
 - O'Keefe Court/Cobble Hill Drive
 - Strandherd Drive & Citigate Drive
- Cedarview Road at:
 - Onassa Circle
- O'Keefe Court at:
 - Future Collector Road

No roads bound the site, and no boundary roads will be considered in this study. TRANS Screenline SL9 is located within the greenbelt north of the site and north of Fallowfield Road and will be reviewed as part of this study.

3.2 Time Periods

As the proposed development is composed primarily of residential units, the AM and PM peak hours will be examined.

3.3 Horizon Years

The anticipated build-out year is 2038. No additional horizons will be evaluated as part of this study given the distant nature of the site build-out.

4 Development-Generated Travel Demand

4.1 Factors Impacting Forecasted Travel Demands

A number of factors influencing the subject development's travel characteristics are proposed, present, or evolving, as detailed within this section.

4.1.1.1 *Evolving Context for Trip Generation*

The trip generation methodologies and trends documented by ITE and employed within the TRANS Trip Generation Manual (2020) represent a historical mobility context, however, evolution is still occurring in how people get connected with products, services, and employment.

An increasing number of trips previously made by auto travel and other modes are being captured by internet and telecommunication technologies. These trips include those reduced by work from home, either fully remote or hybrid, online services such as fitness, banking, medical, or consultation appointments, and e-commerce which converts retail trips during the peak hours into off-peak deliveries. As future travel surveys are conducted the measured trip generation of a land use simply will not capture trips made virtually. In the interim, a reduced trip generation rate is proposed to account for these trends in long-term planning.

While these trends are anticipated to impact background traffic, specific design elements employed for the community can enable this shift for the subject development. Examples of such elements include fibreoptic internet and 5G wireless connectivity, dwelling design that includes spaces such as dens for home office use, the provision of supportive amenity spaces, and the presence of cafés and co-working spaces within walking distance. It is noted that the nearby proposed development at 4451 Strandherd Drive includes such co-working space as part of the concept plan.

It is yet to be seen what the true impact of the present-day virtual connectivity are, given the associated mobility trends are assured to be impeded by the success of the overall trip reductions on the transportation network. A form of induced demand from virtual connectivity is expected to be a large contributing factor to the observed increases in mode shares for auto travel and associated decreases in transit travel noted in the most recent origin-destination survey. For example, as a substantial proportion of the population shifts to a hybrid work environment, the reduction in demand on the road network creates residual capacity which is subsequently consumed by network users previously using different modes or routes to complete their trips. While it would be expected to take years to return to pre-pandemic mode shares based on the level of road capacity liberated by the hybrid work model and other above-noted trends, the pre-pandemic sustainable transportation mode shares would be expected to be quickly exceeded after this point is reached. The end result of this confluence of factors would be a large increase in overall area and intensity of developed lands in the City with a similar capacity in the overall road network. Therefore, beyond the provision of road and transit connectivity for new neighbourhoods, the future network conditions may, more closely, resemble the pre-pandemic operations with greater transit uptake and service levels than they would an extrapolation of the pre-pandemic business-as-usual degeneration of road network operations ad infinitum associated with high auto mode shares.

4.1.1.2 *Community Vision*

Informed by the 15-Minute Community design concept, the community is proposed to include local residential-supportive land uses within the community core which will be accessible by a high degree of pedestrian connectivity both along road corridors and via a system of pathways. Providing direct active transportation connections to the network serving the high density of commercial and employment land uses immediately to the south of the development area will permit higher uptake of active modes and reduce auto dependence.

4.1.1.3 *Transit Service Vision*

A detailed description of the proposed transit routing and service is provided in Section 10.1. A short description of which is that the community is intended to be served by 15-minute transit service all-day, with increases in service frequency during the peak periods. The development's transit routing is proposed to be synergized with existing routes through the Citigate Employment Lands and may optionally provide opportunities for connections

for these lands to other nodes in the City. It is expected that the proposed transit service will permit the development to exceed the typical South Nepean recommended transit shares.

4.2 Mode Shares

Examining the mode shares recommended in the TRANS Trip Generation Manual (2020) for the subject district, derived from the most recent National Capital Region Origin-Destination survey (OD Survey), the existing average district mode shares by land use for South Nepean have been summarized in Table 7.

Table 7: TRANS Trip Generation Manual Recommended Mode Shares – South Nepean

Travel Mode	Single-Detached		Multi-Unit (Low-Rise)		Multi-Unit (High-Rise)		Commercial Generator	
	AM	PM	AM	PM	AM	PM	AM	PM
Auto Driver	51%	53%	49%	49%	58%	54%	74%	61%
Auto Pass.	14%	19%	13%	13%	6%	15%	14%	27%
Transit	25%	18%	26%	24%	30%	25%	1%	1%
Cycling	1%	1%	2%	2%	2%	0%	0%	0%
Walking	9%	10%	9%	12%	4%	7%	11%	11%
Total	100%	100%	100%	100%	100%	100%	100%	100%

Given the trends and development characteristics discussed in Section 4.1, modified mode share targets are proposed for the development and are summarized in Table 8.

Table 8: Proposed Development Mode Shares – Locally-Oriented Community

Travel Mode	Single-Detached		Multi-Unit (Low-Rise)		Multi-Unit (High-Rise)		Commercial Generator	
	AM	PM	AM	PM	AM	PM	AM	PM
Auto Driver	40%	42%	38%	38%	47%	43%	70%	57%
Auto Pass.	10%	15%	9%	9%	2%	11%	13%	26%
Transit	30%	23%	31%	29%	35%	30%	6%	6%
Cycling	3%	3%	4%	4%	4%	2%	0%	0%
Walking	17%	18%	17%	20%	12%	15%	11%	11%
Total	100%	100%	100%	100%	100%	100%	100%	100%

These mode shares represent an approximate doubling of the walking and cycling uptake, a slight increase in transit, and an approximately 20% relative reduction of the auto travel compared to the typical Barrhaven suburban travel patterns. Beyond the opportunities for active transportation uptake presented by the immediate area context of the development as discussed in the preceding sections, these changes are partly the result of the reduction in regional travel demands mitigated by the virtual connectivity trends. The proposed mode shares are consistent with more locally-oriented travel and modal selection.

4.3 Trip Generation

This TIA has been prepared with reference to the vehicle and person trip rates for the residential dwellings using the TRANS Trip Generation Manual (2020) and the vehicle trip rates and derived person trip rates for commercial component from the ITE Trip Generation Manual 11th Edition (2021) using the City-prescribed conversion factor of 1.28. Table 9 summarizes the person trip rates for the proposed residential land uses for each peak period and the person trip rates for the non-residential land uses by peak hour.

Table 9: Trip Generation Person Trip Rates by Peak Period

Land Use	Land Use Code	Peak Period	Vehicle Trip Rate	Person Trip Rates
Single-Detached	210 (TRANS)	AM	-	2.05
		PM	-	2.48

Land Use	Land Use Code	Peak Period	Vehicle Trip Rate	Person Trip Rates
Multi-Unit (Low-Rise)	220 (TRANS)	AM	-	1.35
		PM	-	1.58
Multi-Unit (High-Rise)	221 & 222 (TRANS)	AM	-	0.80
		PM	-	0.90
Land Use	Land Use Code	Peak Hour	Vehicle Trip Rate	Person Trip Rates
Retail (<40k sq ft)	822 (ITE)	AM	1.89	2.42
		PM	5.44	6.96

As part of the recent Transportation Master Plan update, the City has developed updated transportation demand outlooks to attempt to account for the evolving commuting trends in the National Capital Region. Specifically considering the future of working from home and the associated impacts on travel demand, here noted to be largely regional, the City developed one reference commuting scenario under which office workers were assumed to commute 3 to 3.5 days per week. Carrying forward the assumptions inherent to this scenario, it can be expected that the person trips generated by office workers will incur up to a 40% reduction from a full-time in-person work week. To carry through effects from this scenario into the subject development trip forecasting, the rates for residential person trips were adjusted to 85% of the original values (representing a 15% reduction) to account for a substantial portion of commuter trips being removed from the network. The adjusted person trip rates for the proposed developments are shown in Table 10 below.

Table 10: Adjusted Trip Generation Person Trip Rates by Peak Period

Land Use	Land Use Code	Peak Period	Vehicle Trip Rate	Person Trip Rates
Single-Detached	210 (TRANS)	AM	-	1.74
		PM	-	2.11
Multi-Unit (Low-Rise)	220 (TRANS)	AM	-	1.15
		PM	-	1.34
Multi-Unit (High-Rise)	221 & 222 (TRANS)	AM	-	0.68
		PM	-	0.77
Land Use	Land Use Code	Peak Hour	Vehicle Trip Rate	Person Trip Rates
Retail (<40k sq ft)	822 (ITE)	AM	1.89	2.42
		PM	5.44	6.96

Table 11 summarizes the total person trip generation for the residential land uses by peak period and for the non-residential land uses by peak hour. Given the 15-minute community vision, only 70% of the commercial component is considered as destination retail, where 30% of the commercial development is assumed to serve the immediate surrounding community of over 1,500 dwellings.

Table 11: Total Residential Person Trip Generation by Peak Period

Land Use	Units	AM Peak Period			PM Peak Period		
		In	Out	Total	In	Out	Total
Single-Detached	342	179	417	596	447	274	721
Multi-Unit (Low-Rise)	1209	416	971	1387	909	715	1624
Multi-Unit (High-Rise)	128	27	60	87	57	41	98
Land Use	GFA (sq. ft.)	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Retail (<40k sq ft)	34,453	50	33	83	120	120	240

Internal capture rates from the ITE Trip Generation Handbook 3rd Edition have been assigned to the development's destination retail component for mixed-use developments. The rates summarized in Table 12 represent the percentage of trips to/from the retail use based on the residential component.

Table 12: Internal Capture Rates

Land Use	AM		PM	
	In	Out	In	Out
Residential to/from Strip Retail Plaza	17%	14%	10%	26%

Pass-by reductions applied to the retail trip generation at a rate of 40% have been included using the recommended value presented in the ITE Trip Generation Manual 11th Edition (2021) for the most similar land use with a recommended rate, "Retail (40k – 150k sq ft)". The application of the pass-by percentage to O'Keefe Court would not be considered to reflect the expected pass-by component of the site trips and accordingly, the analysis will forgo the application of diverted trips and will apply the 40% pass-by to the major movements at the along each Cedarview Road and Fallowfield Road.

Using the above mode share targets for the community, the internal capture and pass-by rates, and the person trip rates, the person trips by mode have been projected. Trip generation by peak hour has been forecasted using the prescribed peak period conversion factors presented in the TRANS Trip Generation Manual (2020) for the residential component. Table 13 summarizes the residential trip generation and the non-residential trip generation by mode and peak hour.

Table 13: Trip Generation by Mode

Travel Mode	Mode Share	AM Peak Hour			PM Peak Hour			Total	
		In	Out	Total	In	Out	Total		
Single-Detached	Auto Driver	40%	34	80	114	42%	82	51	133
	Auto Pass.	10%	9	20	29	15%	30	18	48
	Transit	30%	29	69	98	23%	48	30	78
	Cycling	3%	3	7	10	3%	7	4	11
	Walking	17%	18	41	59	18%	42	26	68
	Total	100%	93	217	310	100%	209	129	338
Multi-Unit (Low-Rise)	Auto Driver	38%	76	177	253	38%	152	119	271
	Auto Pass.	9%	18	42	60	9%	36	28	64
	Transit	31%	71	166	237	29%	124	97	221
	Cycling	4%	10	22	32	4%	17	14	31
	Walking	17%	41	96	137	20%	95	74	169
	Total	100%	216	503	719	100%	424	332	756
Multi-Unit (High-Rise)	Auto Driver	47%	6	14	20	43%	10	8	18
	Auto Pass.	2%	0	1	1	11%	3	2	5
	Transit	35%	5	12	17	30%	8	6	14
	Cycling	4%	1	1	2	2%	1	0	1
	Walking	12%	2	4	6	15%	4	4	8
	Total	100%	14	32	46	100%	26	20	46

Travel Mode		AM Peak Hour				PM Peak Hour			
		Mode Share	In	Out	Total	Mode Share	In	Out	Total
Strip Retail Plaza	Auto Driver	70%	18	12	30	57%	37	31	68
	Auto Pass.	13%	5	4	9	26%	28	23	51
	Transit	6%	2	2	4	6%	6	5	11
	Cycling	0%	0	0	0	0%	0	0	0
	Walking	11%	5	3	8	11%	12	10	22
	Pass-by	40%	-11	-8	-19	40%	-25	-20	-45
	Int. Capture	varies	-9	-5	-14	varies	-12	-31	-43
	Total	100%	30	21	51	100%	83	69	152
Total	Auto Driver	-	134	283	417	-	281	209	490
	Auto Pass.	-	32	67	99	-	97	71	168
	Transit	-	107	249	356	-	186	138	324
	Cycling	-	14	30	44	-	25	18	43
	Walking	-	66	144	210	-	153	114	267
	Pass-by	-	-11	-8	-19	-	-25	-20	-45
	Int. Capture	-	-9	-5	-14	-	-12	-31	-43
	Total	-	353	773	1126	-	742	550	1292

As shown above, a total of 417 new AM and 490 new PM peak hour two-way vehicle trips are projected as a result of the proposed development.

4.4 Trip Distribution

To understand the travel patterns of the subject development, the OD Survey has been reviewed to determine the travel for the residential component, and these patterns were applied based on the build-out of South Nepean. Accounting for some reduction in auto mode trips being resultant from a reduction of regional travel for commuting based on virtual connectivity trends, a 5% reallocation of travel to and from the north has been included in the site's trip distribution. Table 14 below summarizes the distribution.

Table 14: OD Survey Distribution – South Nepean

To/From	% of Trips	Via
North	30%	20% Cedarview Rd (N), 10% Fallowfield Rd (W),
South	10%	10% Citigate Dr (S)
East	55%	45% Fallowfield Rd (E), 10% Strandherd Dr (E),
West	5%	5% Fallowfield Rd (W)
Total	100%	

4.5 Trip Assignment

Using the distribution outlined above, turning movement splits, and access to major transportation infrastructure, the trips generated by the site have been assigned to the study area road network. Figure 11 illustrates the new site generated volumes and Figure 12 illustrates the pass-by auto volumes.

Figure 11: New Site Generation Auto Volumes

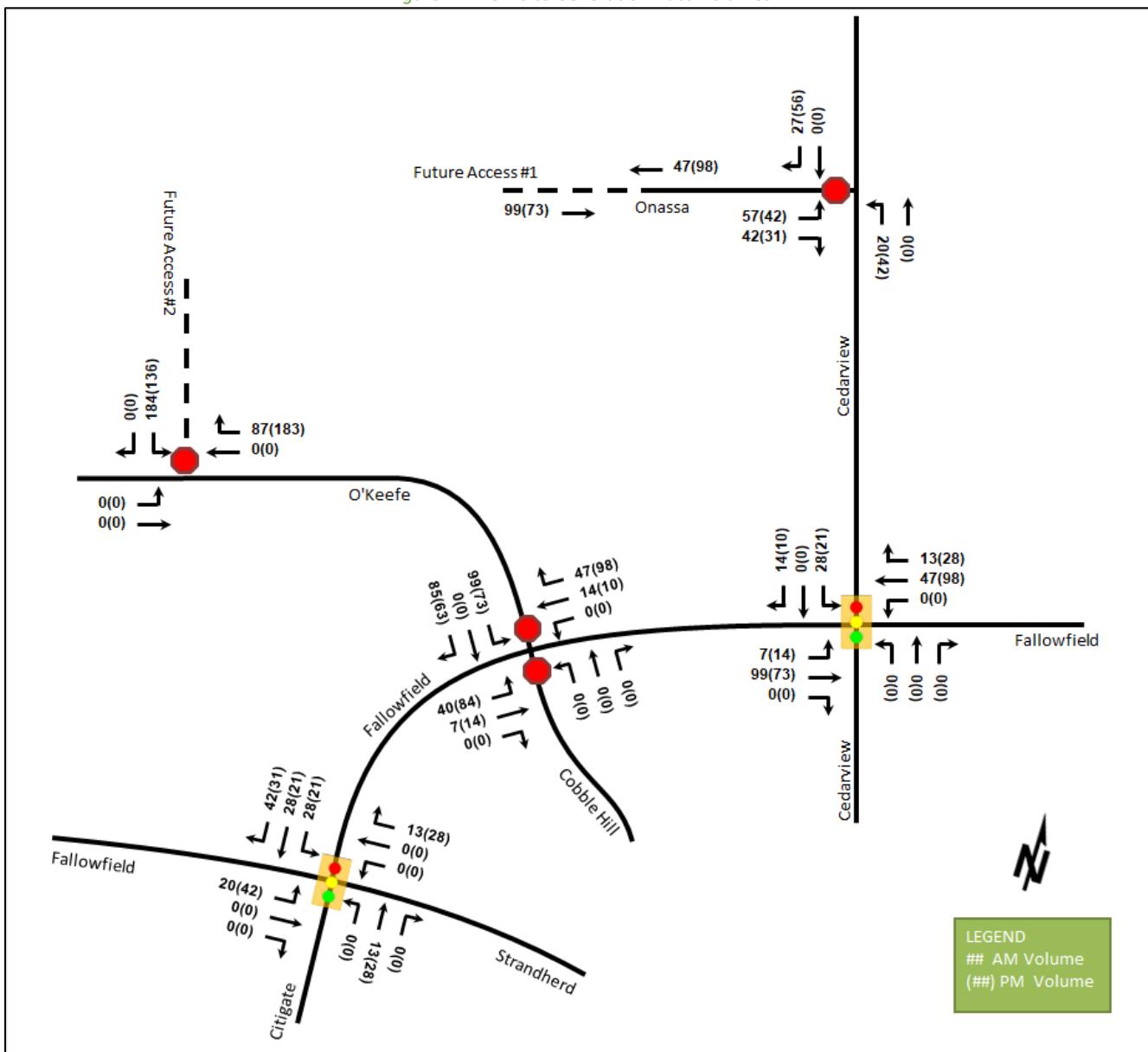
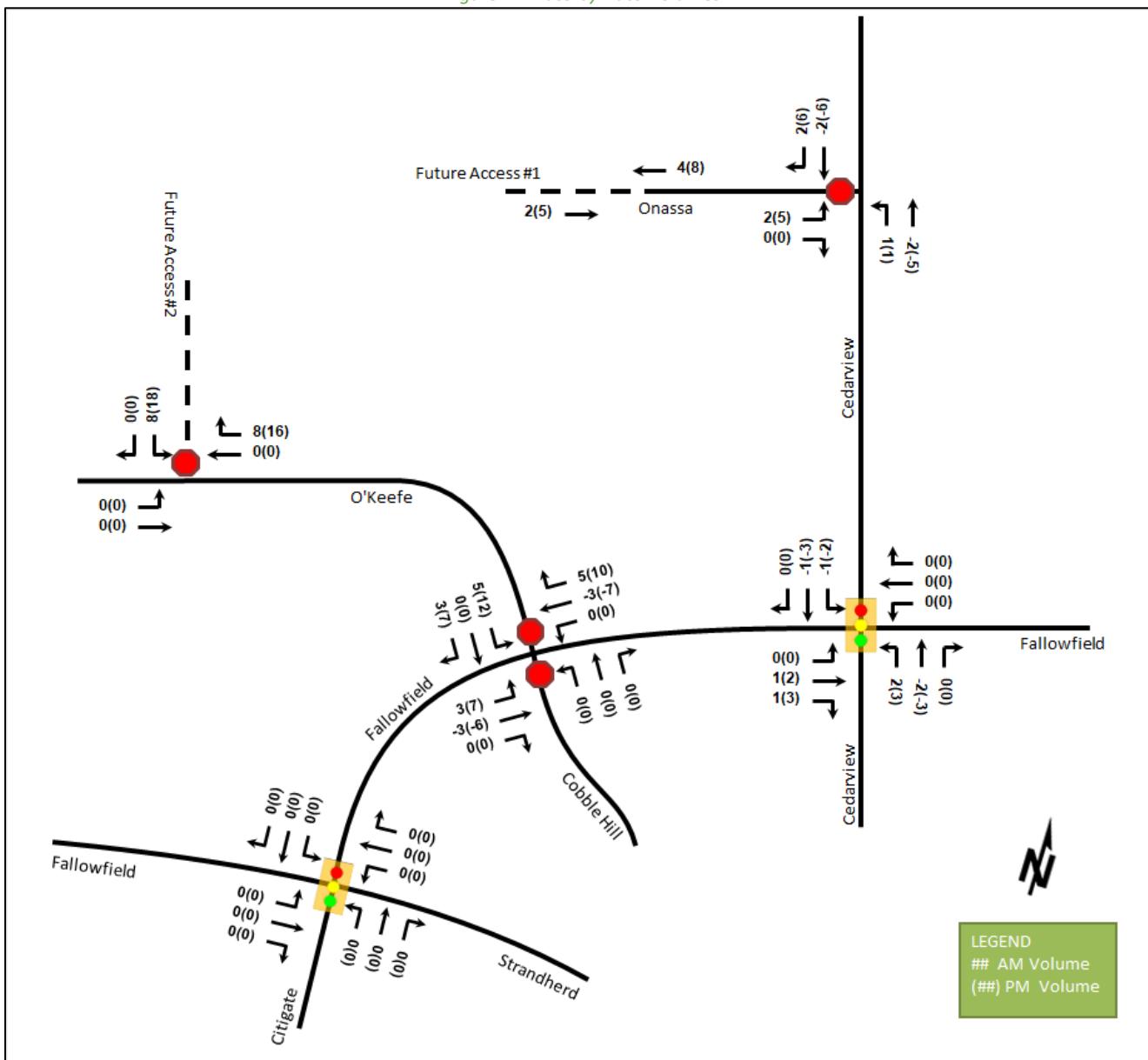


Figure 12: Pass-by Auto Volumes



5 Exemption Review

Table 15 summarizes the exemptions for this TIA.

Table 15: Exemption Review

Module	Element	Explanation	Exempt/Required
Site Design and TDM			
4.1 Development Design	4.1.2 Circulation and Access	Only required for site plan and zoning by-law applications	Exempt
	4.1.3 New Street Networks	Only required for plans of subdivision	Required
4.2 Parking	4.2.1 Parking Supply	Only required for site plan and zoning by-law applications	Exempt

Module	Element	Explanation	Exempt/Required
4.3 Boundary Street Design		All applications	Exempt – No boundary roads
4.5 Transportation Demand Management	All Elements	Only required when the development generates more than 60 person-trips	Required
Network Impact			
3.2 Background Network Travel Demand	All Elements	Only required when one or more other Network Impact Modules are triggered	Required
3.3 Demand Rationalization		Only required when one or more other Network Impact Modules are triggered	Required
4.6 Neighbourhood Traffic Calming	4.6.1 Adjacent Neighbourhoods	<p>If the development meets all of the following criteria along the route(s) site generated traffic is expected to utilize between an arterial road and the site's access:</p> <ol style="list-style-type: none"> 1. Access to Collector or Local; 2. "Significant sensitive land use presence" exists, where there is at least two of the following adjacent to the subject street segment: <ul style="list-style-type: none"> • School (within 250m walking distance); • Park; • Retirement / Older Adult Facility (i.e. long-term care and retirement homes); • Licensed Child Care Centre; • Community Centre; or • 50%, or greater, of adjacent property along the route(s) is occupied by residential lands and a minimum of 10 occupied residential units are present on the route. 3. Application is for Zoning By-Law Amendment or Draft Plan of Subdivision; 4. At least 75 site-generated auto trips; 5. Site Trip Infiltration is expected. Site traffic will increase peak hour vehicle volumes along the route by 50% or more. 	Exempt
4.7 Transit	4.7.1 Transit Route Capacity	Only required when the development generates more than 75 transit trips	Required
	4.7.2 Transit Priority Requirements	Only required when the development generates more than 75 auto trips	Required
4.8 Network Concept		Only required when proposed development generates more than 200	Required

Module	Element	Explanation	Exempt/Required
		person-trips during the peak hour in excess of equivalent volume permitted by established zoning	
4.9 Intersection Design	4.9.1 Intersection Control	Only required when the development generates more than 75 auto trips	Required
	4.9.2 Intersection Design	Only required when the development generates more than 75 auto trips	Required

6 Development Design

6.1 Design for Sustainable Modes

The proposed development is a residential subdivision with a mix of densities and unit types between single detached houses and mid-rise condo units. Sidewalks and cycletracks are proposed on each side of a collector road through the subdivision which is proposed to connect to O'Keefe Court to Onassa Circle. Sidewalks are proposed along at least one side of all local roads throughout the subdivision, and paving of the existing crushed stone multi-use pathway along the hydro corridor is proposed as part of the development. Pedestrian crossovers (Type C) are proposed at each of the three intersections of the MUP and the collector road.

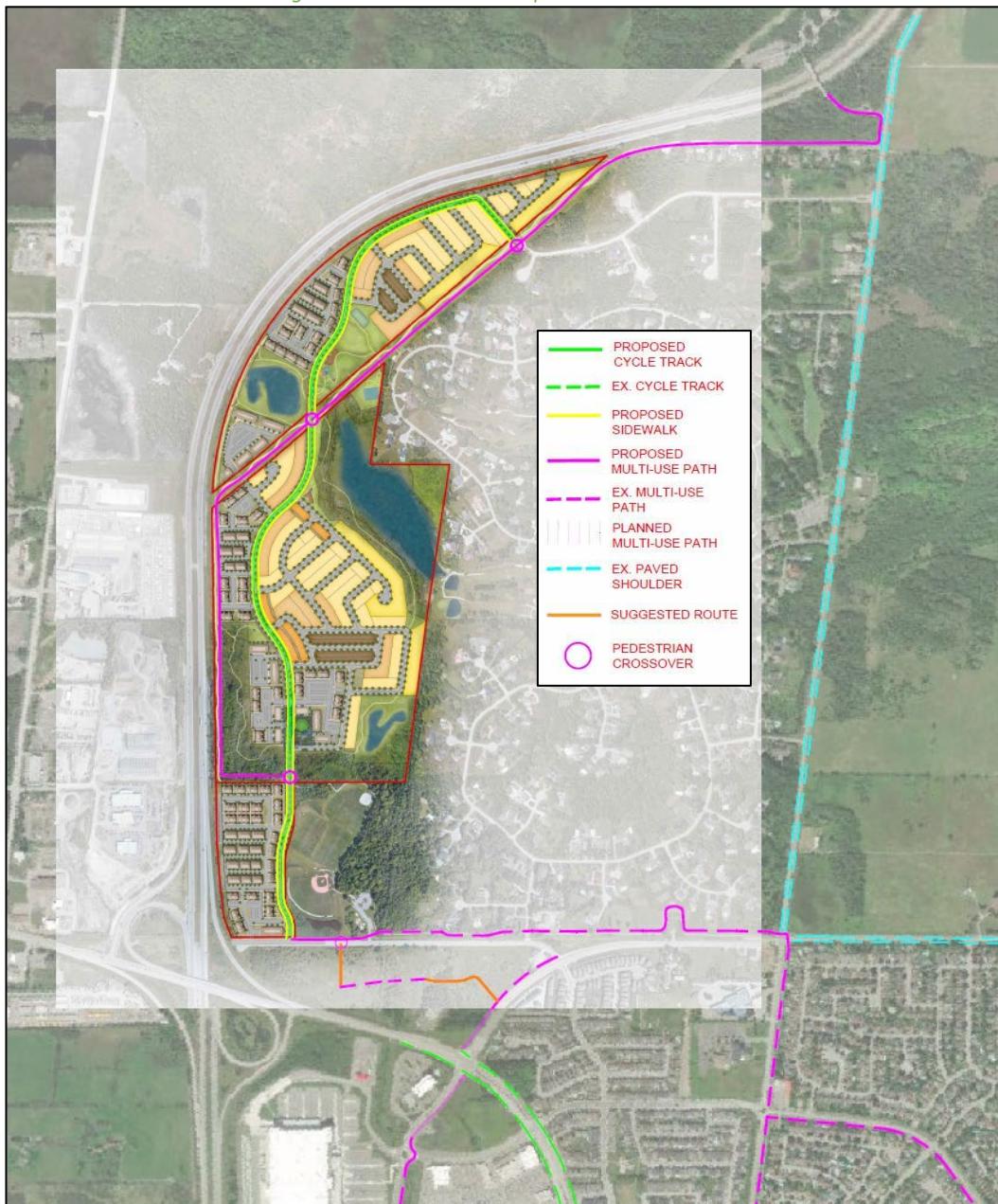
A main street section is located centrally alongside the highest density areas, which is anticipated to have an enhanced public realm with space for additional public use. Figure 13 illustrates the major internal pedestrian and cycling network for the subdivision.

Figure 13: Internal Pedestrian and Cycling Network



Active transportation facilities are proposed to be extended beyond the new community. To the south, an extension of the MUP to the existing MUP on O'Keefe Court and cycling routes on Lusk Street is proposed. This route would connect the community to the intersection of Strandherd Drive at Fallowfield Road/Citigate Drive more directly than using the facilities along the road network. These facilities would also improve connectivity for the surrounding area. To the north, the MUP is proposed to be extended along the north side of Lytle Avenue, or the route may continue as mixed flow along Lytle Avenue, continuing as a MUP on the west side of Cedarview Road to the south side of the driveway to the Log Farm located in the Greenbelt, up to the bridge across the 416. Through this northern MUP extension and connection to the Log Farm, the community will be able to access to the NCC trail system. Figure 14 illustrates the area active transportation connections including the newly proposed external active transportation facilities.

Figure 14: Area Active Transportation Connections



6.2 New Street Networks

6.2.1 New Collector Road

The subdivision will include a new 26.0-metre-wide collector cross-section through the development area connecting O'Keefe Court to Onassa Circle. It is proposed that the sidewalk and cycling facilities within the new collector's cross-section integrate with the MUP where it meets the current terminus of Onassa Circle. Active modes would continue north on the MUP to Lytle Avenue.

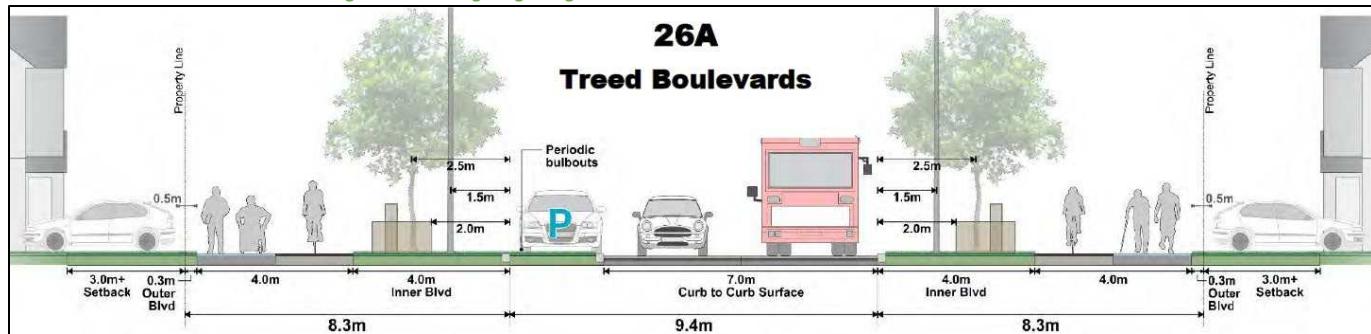
The new collector road cross-sections will be context sensitive to the adjacent land uses through the proposed subdivision. Along the densest development areas, a main street cross-section proposed, including enhanced pedestrian realms, cycletracks, and parking on both sides of the road. Throughout the remainder of the

development, a 26A cross-section from the Designing Neighbourhood Collector Streets guidance is proposed, modified to increase increased boulevard space where lots front only one side of the road. The main street cross section is illustrated in Figure 15 and cross-section 26A from the Designing Neighbourhood Collector Streets guidance is illustrated in Figure 16.

Figure 15: Main Street Cross-Section



Figure 16: Designing Neighbourhood Collector Streets Cross-Section 26A



6.2.2 New Local Roads

Typical local roads of 18.0-metre rights-of-way are proposed throughout the development, as City standard 18.0-metre local cross-sections with sidewalks on one side of most roads and on both sides where appropriate. Local roads are proposed to be posted as 30 km/h and internal road intersections are recommended to be stop-controlled on the minor approaches of all intersections.

6.2.3 Traffic Calming

Traffic calming measures targeting a 30 km/h operating speed will be applied throughout the community and speed limits are proposed to be posted at 30 km/h. Horizontal deflection measured including bulb-outs, which are proposed to narrow roadways and intersections at strategic locations to reduce vehicle speeds on straight stretches. Vertical deflection measures including speed humps, are proposed along local roads are proposed to reduce vehicle speeds on straight stretches. The location of speed humps is subject to minor changes and will need to be refined as part of the detailed engineering submission once the locations of the driveway, stormwater flows, surface ponding, and servicing elements, such as underground utilities and fire hydrants, have been

established. On-street parking will also be a key traffic calming feature of the new community and is generally included as part of all typical roadway cross-sections, and on both sides of the main street.

Figure 17 illustrates the conceptual key locations for traffic calming features within the new community.

Figure 17: Proposed Key Traffic Calming Measures



7 Transportation Demand Management

7.1 Context for TDM

The mode shares used within the TIA represent a reduction in auto travel and an increase in walking, commensurate with the local urban design and broader social trends. Overall, meeting the modal share targets

are contingent on the successful implementation of the community design, however supporting TDM measures should be provided to help ensure these targets are met.

The subject site is not within a design priority area and the total bedrooms within the development is subject to the final unit breakdown and layout selections by purchasers. No age restrictions are noted.

7.2 Need and Opportunity

As previously stated, the mode share targets have been driven by the proposed community's area context, the urban design, and by social trends. It is anticipated that the proposed targets will be met due to this robust set of factors. The role of transportation demand management measures will be aimed at providing awareness of travel mode options, reducing the need for vehicle ownership, and driving the adoption of transit for local and regional travel early in the development buildout. Any existing or forecast capacity issues are anticipated to further drive sustainable transportation adoption.

7.3 TDM Program

The “suite of post occupancy TDM measures” has been summarized in the TDM checklists for the residential and retail land uses. The checklist is provided in Appendix F. The key TDM measures recommended include:

- Display relevant walking and cycling maps along with transit schedules and route maps at major residential and retail entrances
- Provide a multimodal travel option information package to new residents and employees
- Contract with provider to install on-site carshare vehicles and promote their use by residents
- Contract with OC Transpo to provide early transit services until regular services are warranted by occupancy levels

8 Background Network Travel Demands

8.1 Transportation Network Plans

The transportation network plans were discussed in Section 2.3. The interim buildout of the Barnsdale Road Highway 416 interchange is understood to be 2029, the extension of Chapman Mills Drive BRT is anticipated by the 2038 horizon. No extension of the LRT to Barrhaven will be assumed to be complete by the 2038 horizon, and the completion of the Greenbank Road re-alignment to Cambrian Road anticipated by this horizon. The timing for the signalization of Cobble Hill Drive will be discussed within the operations section.

Once completed, the Barnsdale Interchange is expected to reduce the pressure on Strandherd Drive and the Highway 416-Fallowfield Road interchange from development in Barrhaven South. Local to the subject development lands, the direct impact is expected to be lowering the overall demand on the east-west travel at the Strandherd Drive at Fallowfield Road/Citigate Drive intersection. Similarly, the Chapman Mills Drive BRT is anticipated to reduce growth-related pressures on Strandherd Drive.

In the background growth for the future horizon, the nominal growth rates have been included on Strandherd Drive and any further expected development related growth is assumed to be accommodated through the Barnsdale Interchange and Chapman Mills BRT corridor.

8.2 Background Growth

Other area traffic studies employed a 1%-2% annual background growth rate on Strandherd Drive and Fallowfield Road in addition to other explicitly considered background developments.

A review of the background projections from the City's TRANS Regional Model for the 2011 and 2031 horizons was completed to determine the anticipated background growth for each of the study area roadways. It is assumed that the expected growth will continue beyond the 2031 horizon to the build-out horizon. The background TRANS model growth rates are summarized in Table 16, and Table 17 summarizes the recommended growth rates to be considered within the study area. The TRANS model plots are provided in Appendix G.

Table 16: TRANS Regional Model Projections – Study Area Growth Rates

Street	TRANS Rate	
	Eastbound	Westbound
Fallowfield Rd north of Strandherd Dr	0.34%	0.11%
Fallowfield Rd west of Citigate Dr	2.14%	1.98%
Strandherd Dr	3.46%	2.17%
	Northbound	Southbound
Cedarview Rd north of Fallowfield Rd	1.07%	5.06%
Cedarview Rd south of Fallowfield Rd	2.31%	5.05%

Table 17: Recommended Area Growth Rates

Street	AM Peak Hour		PM Peak Hour	
	Eastbound	Westbound	Eastbound	Westbound
Fallowfield Rd north of Strandherd	0.50%	0.25%	0.25%	0.50%
Fallowfield Rd west of Citigate	2.25%	2.00%	2.00%	2.25%
Strandherd Dr	3.50%	2.25%	2.25%	3.50%
	Northbound	Southbound	Northbound	Southbound
Cedarview Rd north of Fallowfield	1.00%	5.00%	5.00%	1.00%
Cedarview Rd south of Fallowfield	2.50%	5.00%	5.00%	2.50%

8.3 Other Developments

The background developments explicitly considered in the background conditions (Section 8.2) include:

- 115 Lusk Street
- 135 Lusk Street
- 140 Lusk Street
- 4451 Fallowfield Road
- 4433 Strandherd Drive
- CitiGate
- 444 Citigate, 560 Dealership Drive

Traffic from the remaining Citigate Employment Lands development areas were taken from the trip generation information in the 444 Citigate, 560 Dealership Drive TIA. The background development volumes within the study area have been provided in Appendix H.

9 Demand Rationalization

9.1 2038 Future Background Operations

Figure 18 illustrates the 2038 background volumes and Table 18 summarizes the 2038 background intersection operations. The level of service for signalized intersections is based on v/c calculations for individual lane movements and MMLOS Guidelines weighted v/c methodology for the overall intersection, per direction from Transportation Engineering Services, and average delay for unsignalized intersections. The synchro worksheets for the 2038 future background horizon are provided in Appendix I.

Figure 18: 2038 Future Background Volumes

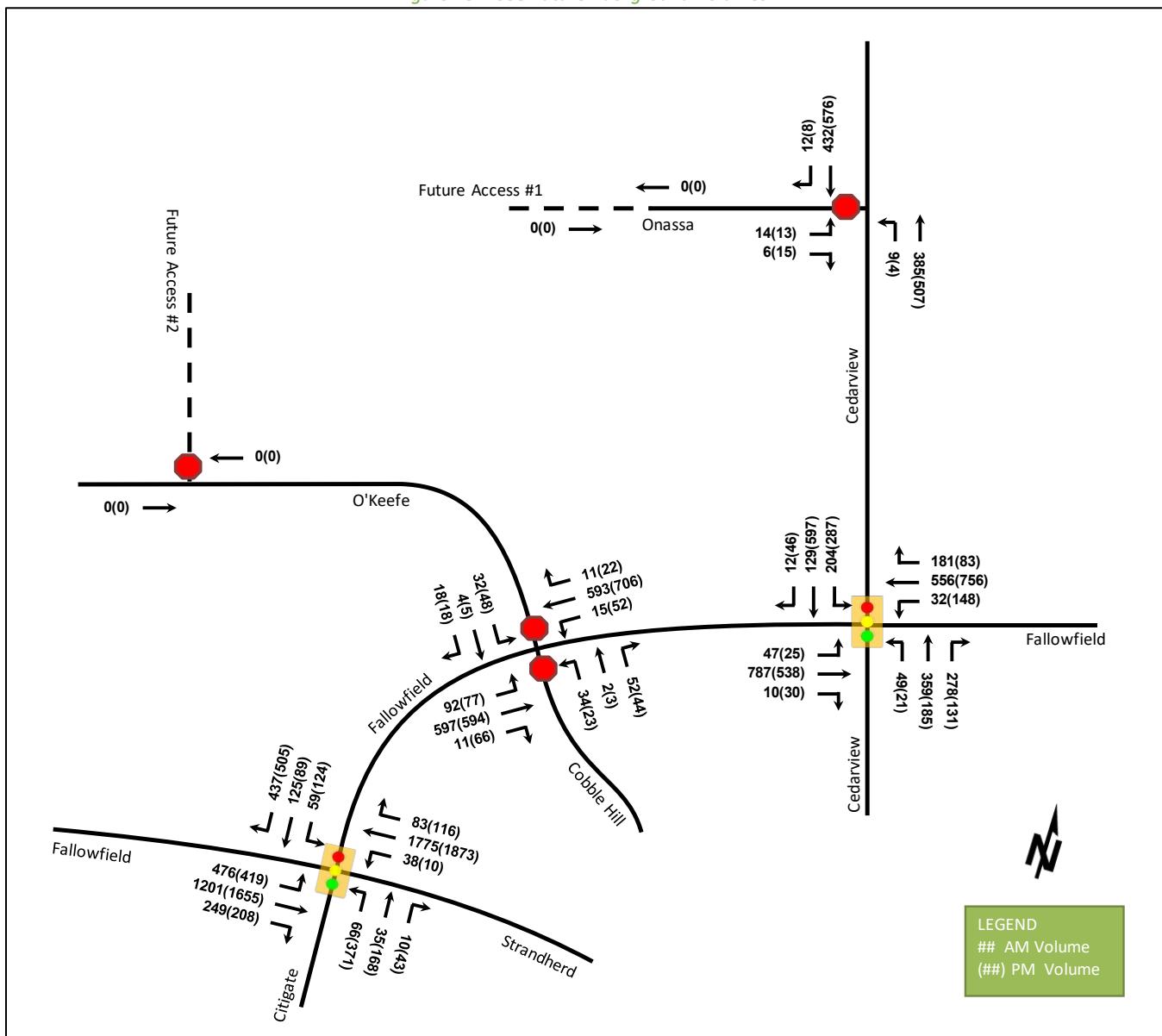


Table 18: 2038 Future Background Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
Cedarview Road at Onassa Circle Unsignalized	EBL/R	C	0.05	15.3	1.5	C	0.09	17.2	2.3
	NBL/T	A	0.01	8.4	0.0	A	0.00	8.6	0.0
	SBT/R	-	-	-	-	-	-	-	-
	Overall	A	-	0.4	-	A	-	0.5	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
Fallowfield Road/Citigate Drive at Strandherd Drive <i>Signalized</i>	EBL	C	0.77	54.0	70.7	D	0.88	70.2	#79.9
	EBT	C	0.74	29.7	#219.2	F	1.23	140.4	#343.9
	EBR	A	0.29	4.7	19.4	A	0.31	8.9	27.9
	WBL	A	0.37	62.2	19.5	A	0.16	58.8	7.8
	WBT	F	1.46	239.5	#416.8	F	2.50	701.7	#428.7
	WBR	A	0.12	0.3	0.0	A	0.25	3.4	6.0
	NBL	A	0.34	57.4	14.6	A	0.57	49.3	#92.8
	NBT/R	A	0.34	49.6	19.4	C	0.74	59.7	66.2
	SBL	A	0.29	47.8	22.4	A	0.33	43.5	45.3
	SBT	A	0.53	53.7	40.9	A	0.28	40.1	27.4
	SBR	D	0.83	22.7	47.9	D	0.89	31.1	70.1
	Overall	F	1.21	113.2	-	F	1.80	292.9	-
Fallowfield Road at O'Keefe Court/ Cobble Hill Drive <i>Unsignalized</i>	EBL	A	0.10	9.3	2.3	A	0.09	9.7	2.3
	EBT	-	-	-	-	-	-	-	-
	EBR	-	-	-	-	-	-	-	-
	WBL	A	0.02	8.9	0.0	A	0.06	9.1	1.5
	WBT	-	-	-	-	-	-	-	-
	WBR	-	-	-	-	-	-	-	-
	NB	E	0.48	41.0	17.3	F	0.48	50.5	16.5
	SBL	F	0.42	83.2	12.8	F	0.73	145.2	24.8
	SBT/R	C	0.08	19.2	2.3	C	0.10	22.5	2.3
	Overall	A	-	5.2	-	A	-	7.4	-
	EBL	A	0.15	13.7	10.5	A	0.20	17.4	7.8
	EBT	D	0.87	32.3	#192.4	B	0.64	20.5	94.7
Fallowfield Road at Cedarview Road <i>Signalized</i>	EBR	A	0.01	0.0	0.0	A	0.04	2.0	2.5
	WBL	A	0.23	17.9	9.7	A	0.54	24.1	35.5
	WBT	B	0.61	18.9	100.0	D	0.90	36.3	#179.7
	WBR	A	0.21	2.7	9.7	A	0.11	4.1	7.6
	NBL	A	0.13	20.0	12.8	A	0.28	31.2	9.2
	NBT	B	0.66	30.7	73.4	A	0.30	21.5	37.1
	NBR	A	0.51	15.0	38.0	A	0.22	4.7	10.8
	SBL	E	0.97	84.8	#69.0	C	0.72	36.2	#76.1
	SBT/R	A	0.26	21.0	28.2	F	1.05	77.7	#177.4
	Overall	D	0.89	28.0	-	E	0.97	38.1	-

Notes: Saturation flow rate of 1800 veh/h/lane
 Queue is measured in metres
 Peak Hour Factor = 1.00

Delay = average vehicle delay in seconds
 m = metered queue
 # = volume for the 95th %ile cycle exceeds capacity

At the 2038 future background horizon, the study area intersections are anticipated to operate worse than in the existing conditions with the background growth and development volumes impacting specific movements.

At the intersection of Fallowfield Road/Citigate Drive at Strandherd Drive, during both peak hours, the westbound through movement is expected to incur further capacity, delay, and queueing issues. During the AM peak hour, the overall intersection is forecast to be over theoretical capacity and may be subject to high delays, and the eastbound through movement may exhibit extended queues. During the PM peak hour, the eastbound through movement is forecast to be over theoretical capacity and may be subject to high delays, and the overall intersection is anticipated to be over theoretical capacity with high delays.

At the intersection of Fallowfield Road at O'Keefe Court/ Cobble Hill Drive, the southbound left movement is anticipated to have high delays during both peak hours, and the northbound movement is anticipated to have high delays during the PM peak hour.

At the intersection of Fallowfield Road at Cedarview Road, extended queueing may be present on the southbound left movement during the both peak hours. Also during the PM peak hour, the southbound through/right movement is anticipated to be over theoretical capacity.

9.1.1 Future Background 2038 Mitigation Measures

Signal warrant analysis was undertaken for the intersections of Cedarview Road at Onassa Circle and Fallowfield Road at O'Keefe Court/ Cobble Hill Drive for the 2038 future background conditions and neither intersection was found to meet warrants. Signal warrants are provided in Appendix D.

Turn-lane warrant analysis was performed for the northbound left-turn at the intersection of Cedarview Road at Onassa Circle. The northbound approach was found to warrant a left-turn lane at the future background 2038 horizon, however no turn-lane would be recommended for implementation based on the low total volumes of the movement. Turn-lane warrants are provided in Appendix J.

Although the signal warrant does not meet at intersection of Fallowfield Road at O'Keefe Court/Cobble Hill Drive, to address the background delays, it is recommended that this intersection to be signalized by 2038 to address background operations. Also, to address the capacity issues during the PM peak hour at the intersection of Fallowfield Road at Cedarview Road, signal timing adjustments are proposed. The operations associated with these changes are summarized for the 2038 future background horizon in Table 19. The synchro worksheets for the future background 2038 mitigation measures are provided in Appendix K.

Table 19: 2038 Future Background Intersection Operations – Mitigated

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
Fallowfield Road at O'Keefe Court/ Cobble Hill Drive <i>Signalized</i>	EBL	A	0.21	9.4	16.5	A	0.21	8.9	14.3
	EBT	A	0.50	10.2	94.4	A	0.47	8.9	90.2
	EBR	A	0.01	0.5	0.5	A	0.06	2.3	4.8
	WBL	A	0.03	7.8	3.7	A	0.10	7.2	9.1
	WBT	A	0.50	10.3	94.5	A	0.57	10.7	122.4
	WBR	A	0.01	0.5	0.5	A	0.02	2.9	2.6
	NB	A	0.17	9.9	13.5	A	0.15	11.6	12.9
	SBL	A	0.09	17.0	9.6	A	0.11	19.9	14.5
	SBT/R	A	0.04	9.9	5.2	A	0.05	12.1	6.1
	Overall	A	0.46	10.2	-	A	0.53	9.7	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
Fallowfield Road at Cedarview Road <i>Signalized</i>	EBL	No mitigation required				A	0.24	21.5	8.8
	EBT					B	0.66	23.0	103.2
	EBR					A	0.04	2.5	2.9
	WBL					A	0.58	28.6	40.2
	WBT					E	0.93	42.8	#193.3
	WBR					A	0.12	5.1	8.6
	NBL					A	0.28	31.3	9.5
	NBT					A	0.28	20.9	37.3
	NBR					A	0.21	4.4	10.6
	SBL					B	0.68	32.8	69.9
	SBT/R					E	0.98	59.1	#177.6
	Overall					E	0.95	36.0	-

Saturation flow rate of 1800 veh/h/lane

Delay = average vehicle delay in seconds

Notes:

Queue is measured in metres

m = metered queue

Peak Hour Factor = 1.00

= volume for the 95th %ile cycle exceeds capacity

With the signalization of the intersection of Fallowfield Road at O'Keefe Court/Cobble Hill Drive at the 2038 future background horizon, the intersection is forecast to operate well during both peak hours. No capacity issues are noted.

At the intersection of Fallowfield Roat at Cedarview Road, with signal timing adjustments, during the PM peak hour at the 2038 future background horizon, the operations are anticipated to be similar to the existing conditions. No capacity issues are noted.

9.2 2038 Future Total Operations

As O'Keefe court terminates immediately west of the proposed collector road intersection, this access intersection effectively constitutes a bend in the road, no delays or capacity issues will be present, and the traffic operations will not be analyzed.

Figure 19 illustrates the 2038 future total volumes and Table 20 summarizes the 2038 future total intersection operations. The level of service for signalized intersections is based on v/c calculations for individual lane movements and MMLOS Guidelines weighted v/c methodology for the overall intersection, per direction from Transportation Engineering Services, and average delay for unsignalized intersections. The synchro worksheets for the 2038 future total horizon are provided in Appendix L.

Figure 19: 2038 Future Total Volumes

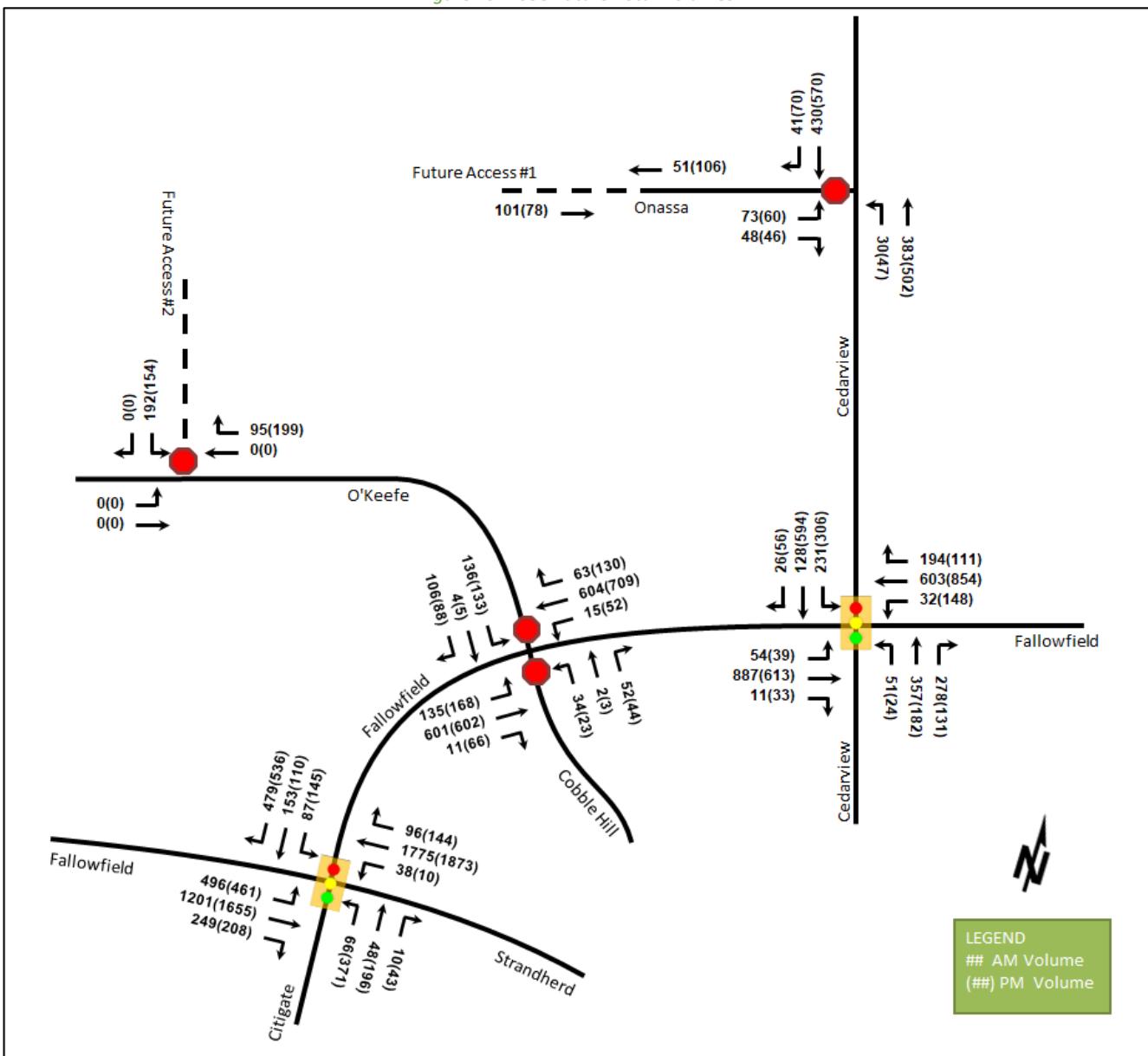


Table 20: 2038 Future Total Intersection Operations

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
Cedarview Road at Onassa Circle Unsignalized	EBL/R	C	0.36	21.6	12.0	D	0.46	33.4	16.5
	NBL/T	A	0.03	8.7	0.8	A	0.05	9.2	1.5
	SBT/R	-	-	-	-	-	-	-	-
	Overall	A	-	2.8	-	A	-	3.1	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
Fallowfield Road/Citigate Drive at Strandherd Drive <i>Signalized</i>	EBL	E	0.91	69.8	#90.9	F	1.02	98.3	#91.5
	EBT	D	0.84	40.4	#220.8	F	1.25	151.3	#343.9
	EBR	A	0.34	5.6	20.1	A	0.32	9.1	28.2
	WBL	A	0.55	84.1	#25.4	A	0.16	58.8	7.8
	WBT	F	1.78	382.3	#416.8	F	2.50	702.6	#428.7
	WBR	A	0.17	0.6	0.0	A	0.34	6.8	13.0
	NBL	A	0.40	61.9	15.2	C	0.78	62.8	#99.1
	NBT/R	A	0.17	27.0	17.5	A	0.55	39.7	64.1
	SBL	C	0.73	88.3	#53.5	B	0.61	63.7	#86.3
	SBT	A	0.38	37.3	42.8	A	0.26	34.0	31.9
	SBR	C	0.77	17.2	56.5	D	0.87	27.8	85.0
	Overall	F	1.42	168.9	-	F	1.82	291.3	-
Fallowfield Road at O'Keefe Court/ Cobble Hill Drive <i>Unsignalized</i>	EBL	B	0.16	10.1	4.5	B	0.23	11.5	6.8
	EBT	-	-	-	-	-	-	-	-
	EBR	-	-	-	-	-	-	-	-
	WBL	A	0.02	9.1	0.8	A	0.06	9.4	1.5
	WBT	-	-	-	-	-	-	-	-
	WBR	-	-	-	-	-	-	-	-
	NB	F	0.85	127.6	36.8	F	1.17	283.9	43.5
	SBL	F	2.47	829.2	103.5	F	3.69	1441.9	115.5
	SBT/R	C	0.30	19.1	9.0	D	0.34	25.2	11.3
	Overall	F	-	72.4	-	F	-	106.9	-
Fallowfield Road at Cedarview Road <i>Signalized</i>	EBL	A	0.22	15.6	12.6	A	0.48	38.5	#18.5
	EBT	F	1.03	63.5	#229.0	C	0.72	23.4	115.0
	EBR	A	0.02	0.1	0.0	A	0.05	2.4	2.9
	WBL	A	0.42	35.9	#16.1	B	0.67	34.9	#47.7
	WBT	B	0.70	22.1	112.9	F	1.02	59.5	#215.7
	WBR	A	0.24	2.8	10.0	A	0.16	4.6	9.9
	NBL	A	0.13	19.7	13.1	A	0.32	33.5	10.3
	NBT	A	0.60	28.0	72.8	A	0.30	21.4	36.3
	NBR	A	0.52	18.5	45.2	A	0.23	4.8	10.9
	SBL	E	0.97	81.3	#78.7	C	0.79	41.5	#85.4
	SBT/R	A	0.27	19.6	29.8	F	1.06	81.6	#180.4
	Overall	F	1.02	38.6	-	F	1.04	46.4	-

Notes: Saturation flow rate of 1800 veh/h/lane

Delay = average vehicle delay in seconds

Queue is measured in metres

m = metered queue

Peak Hour Factor = 1.00

= volume for the 95th %ile cycle exceeds capacity

At the 2038 future total horizon, the study area intersections are anticipated to operate similarly to the 2038 future background conditions.

At the intersection of Fallowfield Road/Citigate Drive at Strandherd Drive, with the addition of site traffic, the eastbound left, westbound left, and southbound left movements may be subject to extended queues during the AM peak hour. During the PM peak hour, the eastbound left movement is over theoretical capacity by v/c of 0.02. This operation would still be considered at the movement's theoretical capacity and the movement may continue to process the forecasted volume of vehicles. It is noted that a reduction in seven vehicles on this movement would reduce v/c to 1.00. As noted in the existing conditions, the east and west pedestrian crossing distances influence the minimum split requirements of the northbound and southbound through phases, and limited opportunities exist to reallocate split at the intersection.

At the intersection of Fallowfield Road at O'Keefe Court/Cobble Hill Drive, during the AM peak hour the southbound left movement is anticipated to be over theoretical capacity and to experience a large increase in delay, and the northbound movement may be subject to high delays. During the PM peak hour at the intersection, the southbound left movement is anticipated to be over theoretical capacity and this movement along with the northbound movement are anticipated to experience large increases in delay.

At the intersection of Fallowfield Road at Cedarview Road, the westbound left movement may exhibit extended queues during both peak hours.

9.2.1 Future Total 2038 Mitigation Measures

Signal warrant analysis was undertaken for the intersections of Cedarview Road at Onassa Circle and Fallowfield Road at O'Keefe Court/ Cobble Hill Drive for the 2038 future total conditions and neither intersection was found to meet warrants. Signal warrants are provided in Appendix D.

Turn-lane warrants were performed for the northbound left-turn at the intersection of Cedarview Road at Onassa Circle. The northbound approach was found to warrant a left-turn lane at the 2038 future total horizon, and to support the development it is recommended that one be provided.

As in the background conditions, Fallowfield Road at O'Keefe Court/Cobble Hill Drive will be evaluated as a signalized intersection to determine the operations once signals are installed. Also as in the background conditions, at the intersection of Fallowfield Road at Cedarview Road, signal timing adjustments have been implemented to address capacity issues associated with unbalanced phasing. The operations associated with these changes are summarized for the 2038 future total horizon are illustrated in Table 21. The synchro worksheets for the future total 2038 mitigation measures are provided in Appendix M.

Table 21: 2038 Future Total Intersection Operations – Mitigated

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
Fallowfield Road at O'Keefe Court/ Cobble Hill Drive <i>Signalized</i>	EBL	A	0.32	7.4	m7.0	A	0.44	8.9	m16.6
	EBT	A	0.50	11.1	m52.9	A	0.48	6.3	51.1
	EBR	A	0.01	0.1	m0.0	A	0.07	0.5	m0.3
	WBL	A	0.03	16.6	m4.0	A	0.11	12.9	m7.7
	WBT	A	0.51	23.5	154.5	A	0.57	19.9	m124.4
	WBR	A	0.07	12.0	m12.9	A	0.13	7.9	m11.8
	NB	A	0.30	20.1	19.5	A	0.29	21.4	17.6
	SBL	C	0.77	71.6	48.5	B	0.63	58.9	48.0
	SBT/R	A	0.32	9.7	14.2	A	0.33	12.5	14.7
	Overall	A	0.56	20.1	-	A	0.58	15.6	-

Intersection	Lane	AM Peak Hour				PM Peak Hour			
		LOS	V/C	Delay	Q (95 th)	LOS	V/C	Delay	Q (95 th)
Fallowfield Road at Cedarview Road <i>Signalized</i>	EBL	A	0.20	10.9	9.9	A	0.60	48.4	m#24.0
	EBT	E	0.97	40.7	#285.2	B	0.70	16.1	77.0
	EBR	A	0.02	0.3	m0.1	A	0.05	1.8	m1.8
	WBL	A	0.44	41.6	#19.2	B	0.66	39.5	#59.0
	WBT	B	0.66	24.6	139.2	E	0.98	57.0	#279.7
	WBR	A	0.24	3.9	14.0	A	0.16	7.9	15.0
	NBL	A	0.13	27.0	17.1	A	0.38	47.6	13.9
	NBT	A	0.58	35.7	97.3	A	0.27	26.8	46.7
	NBR	A	0.49	20.9	55.0	A	0.22	4.9	12.2
	SBL	E	0.99	95.7	#103.9	C	0.76	46.1	#106.0
	SBT/R	A	0.26	26.9	39.9	E	0.98	67.3	#225.8
	Overall	E	0.97	35.0	-	E	0.98	42.6	-

Saturation flow rate of 1800 veh/h/lane

Delay = average vehicle delay in seconds

Notes: Queue is measured in metres
Peak Hour Factor = 1.00m = metered queue
= volume for the 95th %ile cycle exceeds capacity

With the signalization of the intersection of Fallowfield Road at O'Keefe Court/Cobble Hill Drive at the 2038 future total horizon, the intersection operates similarly to the background conditions with the signalization during both peak hours. No capacity issues are noted.

At the intersection of Fallowfield Road at Cedarview Road, with signal timing adjustments, at the 2038 future total horizon, the operations are similar to the 2038 background conditions. With the addition of site traffic, extended queueing may be observed on the westbound left movement during both peak hours, and the eastbound left and southbound left movements during the PM peak hour. No capacity issues are noted.

9.3 Demand Rationalization Conclusions

9.3.1 Background Travel Demand

Capacity issues have been noted at the intersection of Strandherd Drive at Fallowfield Road/Citigate Drive on the eastbound through and westbound through movements in the background conditions. These movements facilitate access to Highway 416 for the majority of the Barrhaven community. Additional background traffic on these movements over the existing volumes are largely anticipated to be a result of remaining growth in the Barrhaven South area. Once the interchange at Barnsdale Road is constructed, it is assumed that most of the forecasted background growth and a proportion of the existing volumes will reduce on these movements.

Further to volume changes, opportunities to address the pedestrian crossing times for the northbound and southbound phasing should be explored by the City to address the capacity on the eastbound and westbound approaches.

9.3.2 Development Travel Demand

The proposed development does not generate additional traffic on the overcapacity eastbound through and westbound through movements at the intersection of Strandherd Drive at Fallowfield Road/Citigate Drive. As this proposed community is situated adjacent to high density of employment and commercial development and proposes 15-minute neighbourhood design and high-quality transit service, and only minor traffic impacts are forecast, rationalization for site travel demand is not required.

10 Transit

10.1 Route Capacity

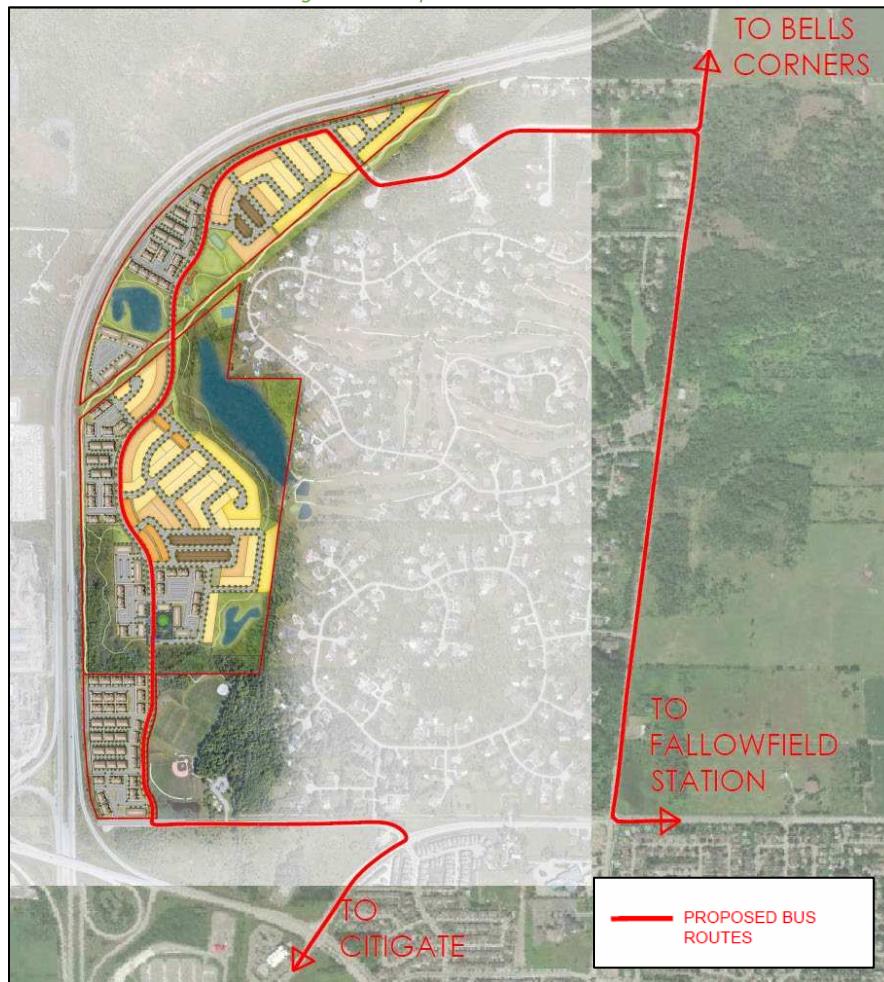
Traditional peak direction transit trips, north to (AM)/from (PM) the city's inner area, is proposed to be synergistic with transit service to the Citigate Employment Lands as extensions of existing and/or future planned routes. For example, during the AM peak period, it would be anticipated that as commuters from the rest of Barrhaven alight within the Citigate Employment Lands, buses on these routes will have low passenger loads to permit a large number of boardings within the Cedarview Community as the routes continue on to Fallowfield Station, or potentially Bells Corners and Moodie Station as determined appropriate by OC Transpo. This model will rely on routes that are understood to be presently underutilized, furthermore leaving future residual capacity for these existing routes' travel based on the synergistic ridership anticipated to result between the differing residential and employment land use patterns. Routing of existing express routes during the peak periods through the subject lands is also recommended.

Travel in the traditional off-peak direction, south to (AM)/from (PM) the rest of Barrhaven is anticipated to have appreciably high demand as trips within Barrhaven, to/from Citigate and beyond along Strandherd Drive will serve the connection of residents to local employment, commercial, and recreational destinations. This traditionally off-peak travel may be synergistic with transit service connecting Bells Corners and Moodie Station to Barrhaven, during the peak periods as determined appropriate by OC Transpo, and may additionally or alternatively provide connectivity east along Fallowfield Road to Fallowfield Station at all times of the day.

Routes travelling to/from Fallowfield Station along Fallowfield Road, through the community, continuing south through Citigate and ultimately along Strandherd Drive to Downtown Barrhaven would provide local connections to other existing and planned communities in Barrhaven including to and for the O'Keefe Court commercial lands.

The proposed transit routing options are illustrated in Figure 20. It is noted that a loop formed by a route travelling through the community continuing along Cedarview Road and connecting to Fallowfield Station would provide the adjacent Cedarhill community with transit connections.

Figure 20: Proposed Transit Routes



As Citigate builds out the transit demands are anticipated to increase and service to be expanded. This increase in demand will support increases in bus frequencies in the study area and along potential route extensions through the subject community.

In Section 5.1 the trip generation by mode was estimated, including an estimate of the number of transit trips that will be generated by the proposed development. Table 22 summarizes the transit trip generation.

Table 22: Trip Generation by Transit Mode

Travel Mode	Residential Mode Share	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Transit	23%-35%	107	249	356	186	138	324

The development is anticipated to generate 356 AM and 324 PM peak hour two-way transit trips at full build-out.

Based on these forecasted values, Table 30 summarizes the theoretical bus requirements to meet travel demands in the traditional peak and off-peak directions.

Table 23: Cedarview Forecasted Transit Service – Minimum Bus Requirements

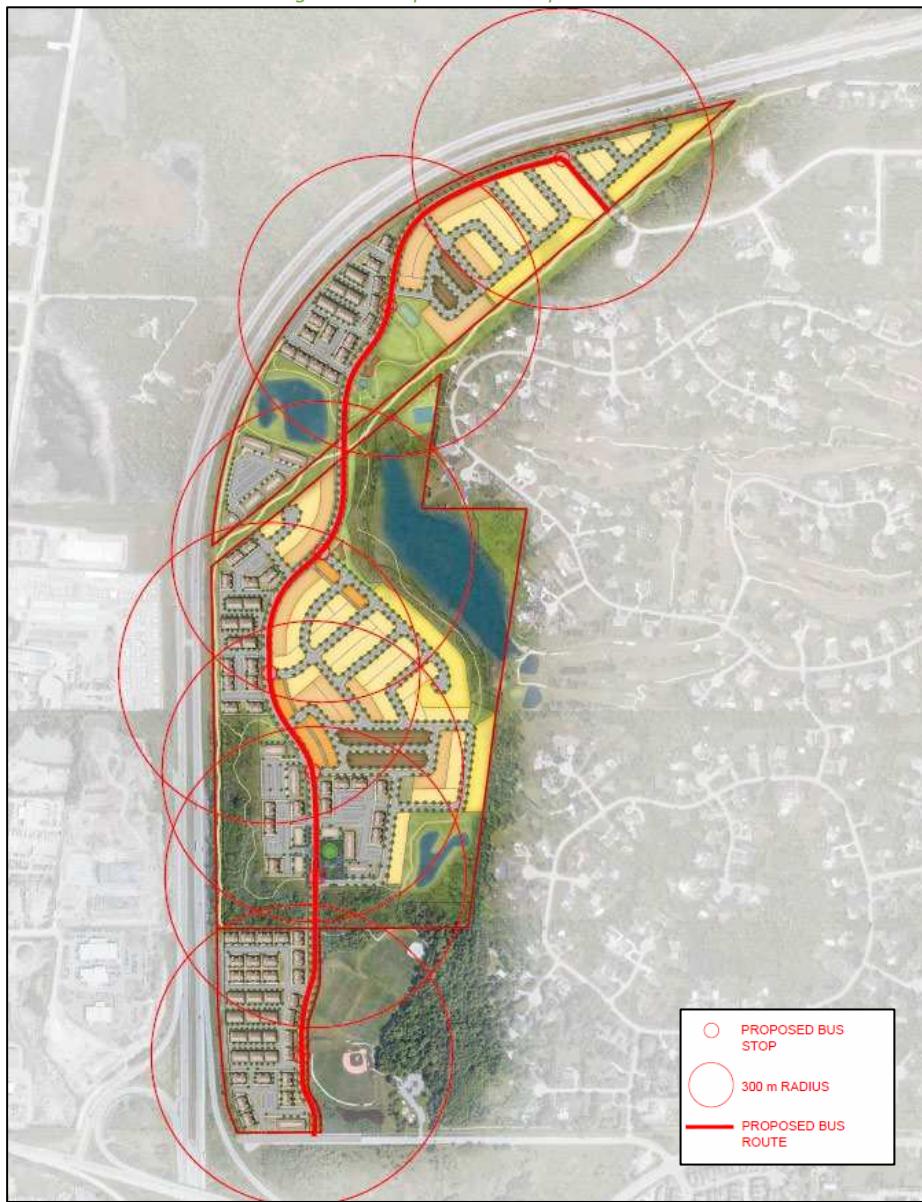
Peak Hour	Direction of Travel	Bus and Service Type		
		Single Capacity: 45 passengers	Articulated Capacity: 70 passengers	Double Decker Capacity: 90 passengers
AM	To the north/east	2	1	1
	To the south	2	2	1
PM	From the north/east	4	2	2
	From the south	6	4	3

Note: Bus and service time ranges assume capacity at 80% load

The intention of the site is to ultimately be serviced by frequent transit (15-minute service) and therefore, it is recommended that bus capacities be selected on this basis when considering the potential loads with which the routes arrive to and depart from the community. As shown above, the target transit demands, derived from the application of a more locally-oriented service model for the recommended transit mode shares from the TRANS trip generation manual for Nepean South, are supportive of frequencies better than 15-minute service in the peak periods.

As illustrated in Figure 20, transit service is envisioned to be routed along the internal collector road from O'Keefe Court to Onassa Circle continuing to Cedarview Road. To provide the entire community with access to these transit routes, the proposed bus stop locations, with 300-metre radii representing approximate 400-metre walking distances, are illustrated in Figure 21.

Figure 21: Proposed Bus Stop Locations



10.2 Transit Priority

Transit movements at the intersection of Fallowfield Road/Citigate Drive at Strandherd Drive for existing routes are the eastbound right, northbound left, and westbound left movements. The recommended transit routes proposed in section 10.1 would utilize the northbound through and southbound through movements, and potentially eliminate the westbound left movement depending on future combination of existing routes with new routes for the subject development. All transit movements at the intersection are anticipated to operate with transit LOS F at the future background and total horizons with the exception of the eastbound right movement which is expected to operate with LOS B at both future horizons. All existing routes are forecast to be subject to delays at this intersection and proposed routes may be subject to lower delays with any shifts from the westbound left movement (LOS F) to the northbound through movement (LOS E). It is anticipated that once the Barnsdale Road Highway 416 interchange is built out, delays at the intersection will be reduced.

At the intersection of Fallowfield Drive at O'Keefe Court/Cobble Hill Drive, the existing transit movements are the eastbound and westbound through movements, and proposed transit movements are the eastbound left and southbound right movements. All movements at this intersection are anticipated to operate with Transit LOS C or better with the exception of the southbound right movement during the PM peak hour which is forecast to operate with transit LOS D in the future background and total conditions.

No existing transit service uses the intersection of Fallowfield Road at Cedarview Road, and no routes service the O'Keefe Court developments or the existing Cedarhill community.

Notwithstanding the foregoing, the transit routes within the study area do not have transit LOS targets, not being existing transit priority corridors and peak period delays are typical of Barrhaven arterial intersections.

11 Network Concept

A screenline analysis was conducted on TRANS Screenline 9 to determine the total capacities of the roadways without and within the study area. Table 35 summarizes the results of the screenline analysis. The relevant 2019 data were provided by the City of Ottawa for TRANS Screenline 9, and are provided in Appendix N.

Table 24: AM Peak Hour Directional Screenline Analysis

Screenline 9	Roads	Lane Capacity [vphpl]	Lanes per Direction	Capacity [vph]	2019 Volumes	Site Traffic	Total Traffic
Northbound	Moodie north of Fallowfield	1,000	1	1,000	505	0	505
	Borrisokane South of Jock River Bridge	1,000	1	1,000	569	0	569
	Cedarview North of Lytle	1,000	1	1,000	497	57	554
	Greenbank North of Fallowfield	1,000	1	1,000	1,234	0	1,234
	Greenbank South of Jock River	800	1	800	677	0	677
	Hwy 416 North of Strandherd	1,800	2	3,600	2,614	42	2,656
	Hwy 416 South of Jock River Bridge	1,800	2	3,600	1,847	0	1,847
	Longfields South of Jock River Bridge	1,000	2	2,000	1,178	0	1,178
	Merivale North of Fallowfield	1,000	1	1,000	1,375	0	1,375
	Moodie South of Jock River Bridge	1,000	1	1,000	271	0	271
	Prince of Wales South of Jock River Bridge	1,000	2	2,000	1,546	0	1,546
	Prince of Wales North of Fallowfield	1,000	1	1,000	922	0	922
	Richmond South of Hope Side	1,000	1	1,000	245	0	245
	Woodroffe North of Fallowfield Transit Station	1,000	2	2,000	2,233	0	2,233
	Total	-	19	22,000	15,713	99	15,812

Screenline 9	Roads	Lane Capacity [vphpl]	Lanes per Direction	Capacity [vph]	2019 Volumes	Site Traffic	Total Traffic
Southbound	Moodie north of Fallowfield	1,000	1	1,000	230	0	230
	Borrisokane South of Jock River Bridge	1,000	1	1,000	231	0	231
	Cedarview North of Lytle	1,000	1	1,000	244	27	271
	Greenbank North of Fallowfield	1,000	1	1,000	463	0	463
	Greenbank South of Jock River	800	1	8,00	238	0	238
	Hwy 416 North of Strandherd	1,800	2	3,600	1,048	20	1,068
	Hwy 416 South of Jock River Bridge	1,800	2	3,600	727	0	727
	Longfields South of Jock River Bridge	1,000	2	2,000	451	0	451
	Merivale North of Fallowfield	1,000	1	1,000	221	0	221
	Moodie South of Jock River Bridge	1,000	1	1,000	157	0	0
	Prince of Wales South of Jock River Bridge	1,000	2	2,000	521	0	0
	Prince of Wales North of Fallowfield	1,000	1	1,000	277	0	0
	Richmond South of Hope Side	1,000	1	1,000	287	0	0
	Woodroffe North of Fallowfield Transit Station	1,000	2	2,000	521	0	0
Total		-	19	22,000	5,616	47	5,663

As a whole, screenline 9 has residual capacity in both the 2019 conditions and with added site traffic. Greenbank Road, Merivale Road, and Woodroffe Avenue are over their theoretical capacities in the peak direction in the existing background conditions, and site traffic is not anticipated to impact these roads. Given the virtual connectivity and downstream associated trends noted in Section 4.1, the future volumes along the screenline may be similar to historical volumes. Based on the 2019 volumes, the development can be accommodated from a network perspective.

12 Intersection Design

12.1 Intersection Control

It is recommended that the intersection of Fallowfield Road at O'Keefe Court/Cobble Hill Drive be signalized by 2038 to address the background conditions, as per current City monitoring.

While the build-out horizon is distant and background volumes are considered conservative, signal timing adjustments may be required to improve background operations at the intersection of Fallowfield Road at Cedarview Road in the future, including the study of the pedestrian crossing configurations by the City.

No signalization of site access intersections, or other changes to network intersection control are recommended as part of this study.

12.2 Intersection Design

12.2.1 2038 Future Total Intersection Operations

The operations are noted in Section 9.2. The study area intersections operate similarly in the total condition to the background conditions. With signals at the intersection of Fallowfield Road at O'Keefe Court/Cobble Hill Drive required to address background conditions, and mitigation through signal timing adjustments to balance operations at the intersection of Fallowfield Road at Cedarview Road, no transportation network modifications are required to support the development.

12.2.2 Intersection MMLOS

Table 25 summarizes the MMLOS analysis for the signalized intersections of Fallowfield Road at Cedarview Road and Fallowfield Road/Citigate Drive at Strandherd Drive. The existing and future conditions for the intersections will be the same and are considered in one row. The intersection analysis is based on the policy area of Developing Community. The MMLOS worksheets has been provided in Appendix O.

Table 25: Study Area Intersection MMLOS Analysis

Intersection	Pedestrian LOS		Bicycle LOS		Transit LOS		Truck LOS		Auto LOS	
	PLOS	Target	BLOS	Target	TLOS	Target	TrLOS	Target	ALOS	Target
Fallowfield Road at Cedarview Road	F	C	F	C	N/A	N/A	E	D	F	D
Fallowfield Road/Citigate Drive at Strandherd Drive	F	C	F	C	N/A	N/A	B	D	F	D

The pedestrian LOS targets will not be met at the study area intersections. To meet pedestrian LOS targets, crossing distances would need to be less than two lane widths on all crossings. Given the nature of arterial roadways, it is not feasible to meet the given targets.

The bicycle LOS targets will not be met at the study area intersections. To meet bicycle LOS targets, segregated facilities and two-stage left turns or left-turn boxes would be required on all approaches at the intersection of Fallowfield Road at Cedarview, and segregated facilities would be required on the southbound approach at the intersection of Fallowfield Road/Citigate Drive at Strandherd Drive.

The truck LOS targets will not be met at the intersection of Fallowfield Road at Cedarview Road. To meet truck LOS targets, effective corner radius would need to be greater than 15 metres or the number of receiving lanes would need at least two lanes.

The auto LOS targets will not be met at the study area intersections. Section 10 includes recommendations to improve the auto LOS at the intersection of Fallowfield Road at Cedarview Road.

12.2.3 Recommended Design Elements

The access intersection of Cedarview Road at Onassa Circle is proposed to have an inbound northbound left-turn lane added on Cedarview Road. The recommended storage length for the lane will be confirmed through subsequent TIA revisions.

No network intersection design elements are anticipated to be required outside of those to address background conditions to support the proposed development.

13 Summary of Improvements Indicated and Modifications Options

The following summarizes the analysis and results presented in this TIA report:

Proposed Site and Screening

- The community is proposed as comprising a mix of densities, from detached dwellings to mid-rise condo blocks
- A new collector road serving the community is proposed to connect O'Keefe Court to Onassa Circle
- The trip generation trigger was met for the TIA Screening

Existing Conditions

- Fallowfield Road, Strandherd Drive, Cedarview Road north of Fallowfield Road are arterial roads, Cedarview Road between Fallowfield Road and Jockvale Road is a major collector road, and south of Jockvale Road south of Jockvale Road is a collector road in the study area
- O'Keefe Court, Cobble Hill Drive, Citigate Drive, Onassa Circle are local roads
- Sidewalks are provided along both sides of Strandherd Drive and Cobble Hill Drive, along the west side of Citigate Drive, and along the south side of Fallowfield Road for approximately 155 metres west of Citigate Drive
- Cycletracks are provided along both sides of Strandherd Drive, on the south side of Fallowfield Road for approximately 155 metres west of Citigate Drive
- MUPs are provided along the east side of Cedarview Road south of Fallowfield Road, on the east side of Citigate Drive south of CrossKeys Place, and on the north side of Fallowfield Road west of Cedarview Road continuing along O'Keefe Court to Lytle Park
- Strandherd Drive is designated as a cross-town bikeway
- A number of transit routes currently serve the Citigate employment lands, but no routes currently travel in proximity to the subject lands
- Capacity issues have been noted on the westbound through movement at the intersection of Fallowfield Road/Citigate Drive at Strandherd Drive during both peak hours in the existing conditions, influenced by the minimum split on the northbound and southbound through phases required by the pedestrian crossing distances
- The intersections of Fallowfield Road at Strandherd Drive and Fallowfield Road at Cedarview Road are noted to have experienced higher collisions than other locations within the study area
- These collisions are mostly rear end collisions which are typically associated with congestion

Planned Conditions

- A new Highway 416 interchange at Barnsdale Road is planned which will mitigate volumes on the Strandherd Drive and Fallowfield Road corridors from the Barrhaven South community
- The intersection of Fallowfield Road at O'Keefe Court/Cobble Hill Drive is understood to be planned for signalization in the future based on monitoring by the City
- The BRT line from Baseline Station to Barrhaven Centre Station is proposed to be converted to LRT
- Chapman Mills Drive BRT is planned to be extended to Barrhaven Centre Station
- Greenbank Road is to be realigned and include median BRT from Chapman Mills Drive to Kilbirnie Drive
- 115 Lusk Street, 135 Lusk Street, 140 Lusk Street, 4451 Fallowfield Road, 4433 Strandherd Drive, CitiGate, 444 Citigate, and 560 Dealership Drive are background developments within the study area

Development Generated Travel Demand

- Future travel trends enabled by virtual connectivity, further capitalized on by proposed urban design and infrastructure should be considered for this development which is anticipated to be built out in 2038
- The community is proposed to be informed by 15-Minute Neighbourhood design philosophy, and will include residential-supportive land uses internally and provide high-quality and direct active transportation links to surrounding employment and commercial land uses
- Fifteen-minute transit service or better is envisioned for the development
- Trip generation rates and mode shares accounting for travel trends and these aspects of the community are proposed in line with reductions in regional auto travel
- The proposed development is forecasted to produce 1126 two-way people trips during the AM peak hour and 1292 two-way people trips during the PM peak hour
- Of the forecasted people trips, 417 two-way trips will be vehicle trips during the AM peak hour and 490 two-way trips will be vehicle trips during the PM peak hour
- Of the forecasted trips, 30% are anticipated to travel north, 10% to the south, 55% to the east, and 5% to both the west and south, accounting for a slight reduction in regional travel enabled by virtual connectivity

Development Design

- The subdivision will include a new 26.0-metre-wide collector cross-section through the development area connecting O'Keefe Court to Onassa Circle
- Sidewalks and cycletracks will be on each side of the collector road through the subdivision
- Sidewalks will be along one side of all local roads throughout the subdivision, and paving of the existing crushed stone mixed-use pathway along the hydro corridor is proposed as part of the development
- Pedestrian crossovers (Type C) are proposed at each of the three intersections of the MUP and the collector road
- MUP connections are proposed to extend to both the north and south
- Typical local roads of 18.0-metre rights-of-way are proposed throughout the development
- Traffic calming measures are proposed including bulb-outs and speed humps to target a 30 km/h operating speed
- The local roads are proposed to be posted as 30 km/h

TDM

- Supportive TDM measures to be included within the proposed development should include:
 - Display relevant walking and cycling maps along with transit schedules and route maps at major residential and retail entrances
 - Provide a multimodal travel option information package to new residents and employees
 - Contract with provider to install on-site carshare vehicles and promote their use by residents
 - Contract with OC Transpo to provide early transit services until regular services are warranted by occupancy levels

Background Conditions

- Other area traffic studies employed a 1%-2% annual background growth rate on Strandherd Drive and Fallowfield Road in addition to other explicitly considered background developments

- Based on the Barnsdale Road interchange and the Chapman Mills BRT accommodating future volumes that would otherwise Strandherd Drive, background growth based on the TRANS volume models will be applied
- The background developments were explicitly included in the background conditions, along with annual background growth rates along Fallowfield Road, Strandherd Drive, and Cedarview Road
- At the 2038 future background horizon, the study area intersections are anticipated to operate worse than in the existing conditions with the background growth and development volumes impacting specific movements
- Capacity issues have been noted at the intersection of Strandherd Drive at Fallowfield Road/Citigate Drive on the eastbound through and westbound through movements in the background conditions
- Once the interchange at Barnsdale Road is constructed, it is assumed that most of the forecasted background growth and a proportion of the existing volumes will reduce on these movements
- Both Cedarview Road at Onassa Circle and Fallowfield Road at O'Keefe Court/ Cobble Hill Drive intersections do not meet the signal warrant for the 2038 future background conditions
- It is recommended that the intersection of Fallowfield Road at O'Keefe Court/Cobble Hill Drive to be signalized by 2038 to address background operations
- Signal timing adjustments are recommended at the intersection of Fallowfield Road at Cedarview Road to better accommodate the future traffic patterns
- The northbound approach was found to warrant a left-turn lane at the future background 2038 horizon at the intersection of Cedarview Road at Onassa Circle
- No turn-lane would be recommended for implementation at the intersection of Cedarview Road at Onassa Circle in the background conditions based on the low total volumes of the movement

Transit

- Traditional peak direction transit trips, north to (AM)/from (PM) the city's inner area is proposed to be synergistic with transit service to the Citigate Employment Lands as extensions of existing and/or future planned routes
- This travel is proposed to rely on potentially underutilized routes, and the synergistic land use patterns would be expected to leave residual capacity for existing ridership to grow along these routes
- Internal routes travelling to/from Fallowfield Station along Fallowfield Road, through the community, continuing south through Citigate and ultimately along Strandherd Drive to Downtown Barrhaven would provide local connections to other existing and planned communities in Barrhaven
- As Citigate builds out the transit demands are anticipated to increase and will support increases in bus frequencies in the study area and along potential route extensions through the subject community
- The development is anticipated to generate 356 AM and 324 PM peak hour two-way transit trips at full build-out
- It is recommended that bus capacities be selected on this basis when considering the potential loads with which the routes arrive to and depart from the community
- Transit routes have been proposed to be routed along the internal collector road from O'Keefe Court to Onassa Circle continuing to Cedarview Road
- All existing routes are forecast to be subject to delays at the intersection of Fallowfield Road/Citigate Drive at Strandherd Drive and proposed routes may be subject to lower delays with route changes from the westbound left movement to the northbound through movement

- It is anticipated that once the Barnsdale Road Highway 416 interchange is built out, delays at the intersection of Fallowfield Road/Citigate Drive at Strandherd Drive will be reduced
- No existing transit service uses the intersection of Fallowfield Road at Cedarview Road, and no routes service the O'Keefe Court developments or the existing Cedarhill community

Network Concept

- Screenline 9 has residual capacity with 2019 traffic
- Given the virtual connectivity and downstream associated trends noted in Section 4.1, the future volumes along the screenline may be similar to historical volumes
- Based on the 2019 volumes, the development can be accommodated from a network perspective

Intersection Design

- The study area intersections at the 2038 future total horizon are anticipated to operate similarly to the 2038 future background conditions
- Signal timing adjustments may be required to improve operations at the intersection of Fallowfield Road at Cedarview Road at the future total horizon
- Both Cedarview Road at Onassa Circle and Fallowfield Road at O'Keefe Court/Cobble Hill Drive intersections do not meet the signal warrant for the 2038 future total conditions
- As in the background conditions, it is recommended that the intersection of Fallowfield Road at O'Keefe Court/Cobble Hill Drive to be signalized by 2038
- The access intersection of Cedarview Road at Onassa Circle is proposed to have an inbound northbound left-turn lane added on Cedarview Road
- As this proposed community is situated adjacent to high density of employment and commercial development and proposes 15-minute neighbourhood design and high-quality transit service, and only minor traffic impacts are forecast, rationalization for site travel demand is not required
- The pedestrian LOS targets will not be met at the study area intersections and would need to be less than two lane widths on all crossings to meet the targets
- The bicycle LOS targets will not be met at the study area intersections
- Segregated facilities, two-stage left turns or left-turn boxes would be required on all approaches at the intersection of Fallowfield Road at Cedarview, and segregated facilities would be required on the southbound approach at the intersection of Fallowfield Road/Citigate Drive at Strandherd Drive in order to meet the bicycle LOS targets
- The truck LOS targets will not be met at the intersection of Fallowfield Road at Cedarview Road, and effective corner radius would need to be greater than 15 metres or the number of receiving lanes would need at least two lanes to meet the targets

14 Conclusion

It is recommended that, from a transportation perspective, the proposed development applications proceed.

Prepared By:



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Transportation Engineering-Intern

Reviewed By:



Christopher Gordon, P.Eng.
Senior Transportation Engineer

Appendix A

TIA Screening Form and PM Certification Form

City of Ottawa 2023 Revisions to 2017 TIA Guidelines
 Step 1 - Screening Form

 Date: 30-May-24
 Project Number: 2023-105
 Project Reference: 4497 O'Keefe Court

1.1 Description of Proposed Development	
Municipal Address	4497 O'Keefe Court
Description of Location	Between Cedarview Road, O'Keefe Court, and Highway 416
Land Use Classification	Rural Zones (RR4, RR4 [647, 648, 649r]), Open Space and Leisure Zones (O1, O1A), Environmental Zone (EP3)
Development Size	342 Single-Detached, 1,209 low-rise dwellings, 128
Accesses	Access via Onassa Circle and O'Keefe Court
Phase of Development	Multiple
Buildout Year	2038
TIA Requirement	Full TIA Required

1.2 Trip Generation Trigger	
Land Use Type	Multi-Family (Low-Rise)
Development Size	1209 Units
Trip Generation Trigger	Yes

1.3 Location Triggers	
Does the development propose a new driveway to a boundary street that is designated as part of the Transit Priority Network, Rapid Transit network or Cross-Town Bikeways?	No
Is the development in a Hub, a Protected Major Transit Station Area (PMTSA), or a Design Priority Area (DPA)?	No
Location Trigger	No

1.4. Safety Triggers	
Are posted speed limits on a boundary street 80 km/hr or greater?	No
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?	No
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)?	No
Is the proposed driveway within auxiliary lanes of an intersection?	No
Does the proposed driveway make use of an existing median break that serves an existing site?	No
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?	No
Does the development include a drive-thru facility?	No
Safety Trigger	No



Certification Form for TIA Study PM

TIA Plan Reports

On April 14, 2022, the Province's Bill 109 received Royal Assent providing legislative direction to implement the More Homes for Everyone Act, 2022 aiming to increase the supply of a range of housing options to make housing more affordable. Revisions have been made to the TIA guidelines to comply with Bill 109 and streamline the process for applicants and staff.

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 associated documents) and signing this document, the individual acknowledges that they meet the four criteria listed below.

CERTIFICATION

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; (Update effective July 2023)

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;

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

I am either a licensed or registered¹ professional in good standing, whose field of expertise

- is either transportation engineering
- or transportation planning.

¹ License of 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 17 day of August, 20 23.
(City)

Name : Andrew Harte

Professional title: Senior Transportation Engineer / Vice-President Ottawa



Signature of individual certifier that s/he/they meet the above criteria

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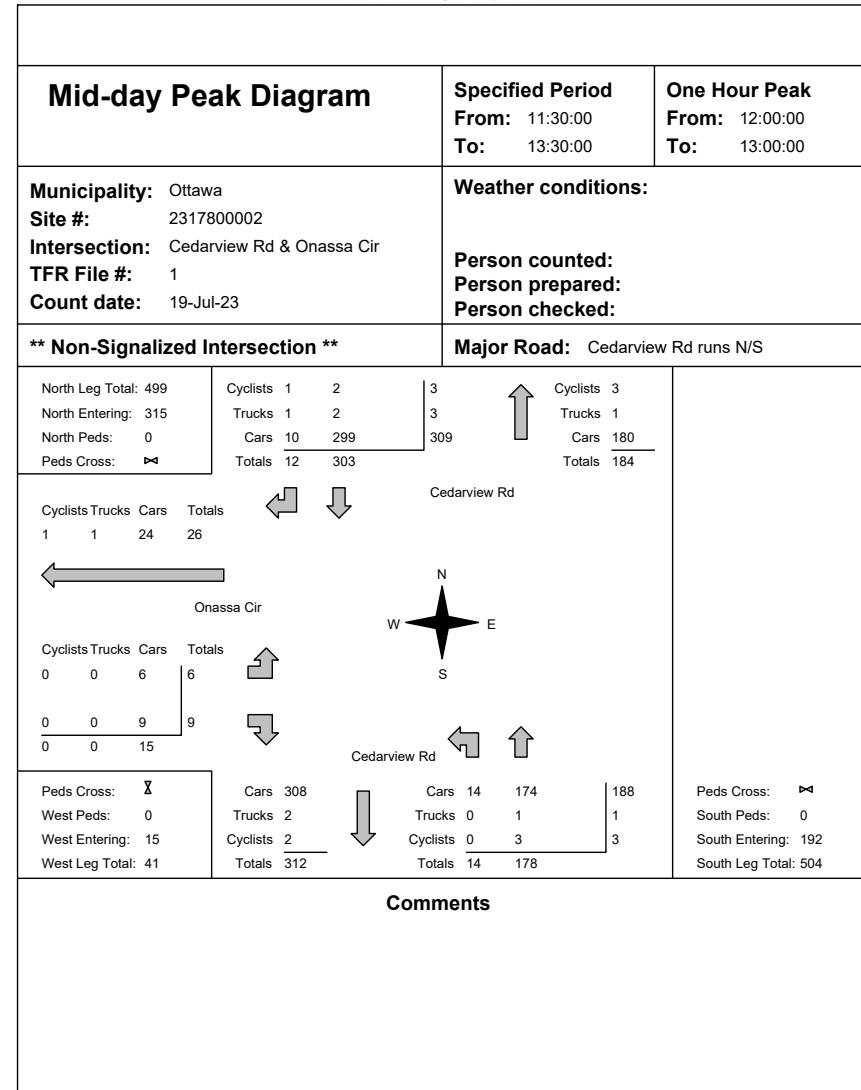
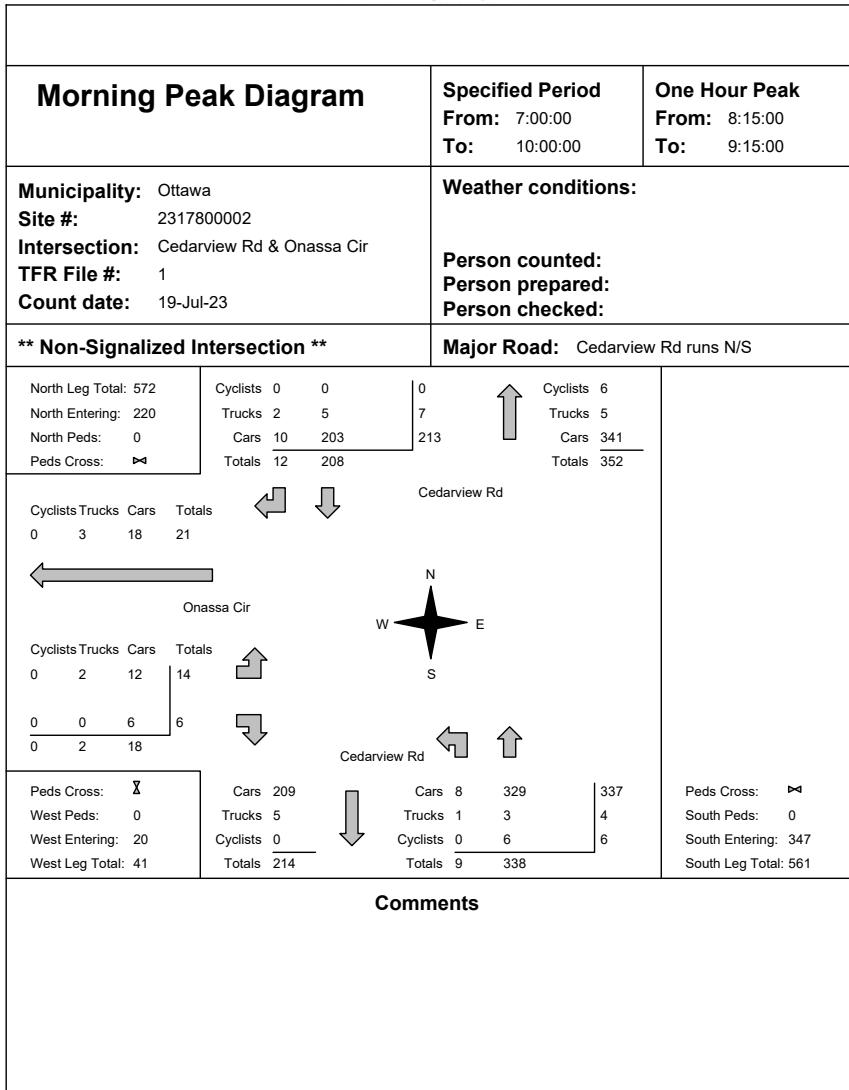
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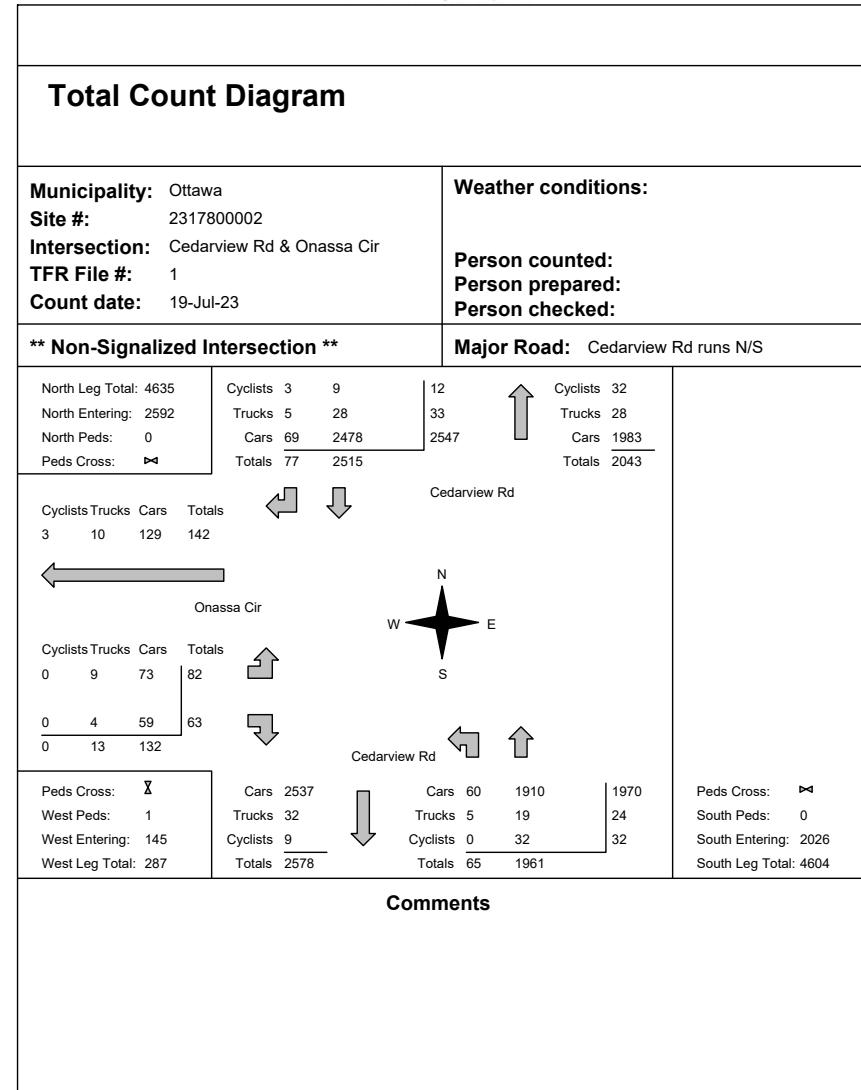
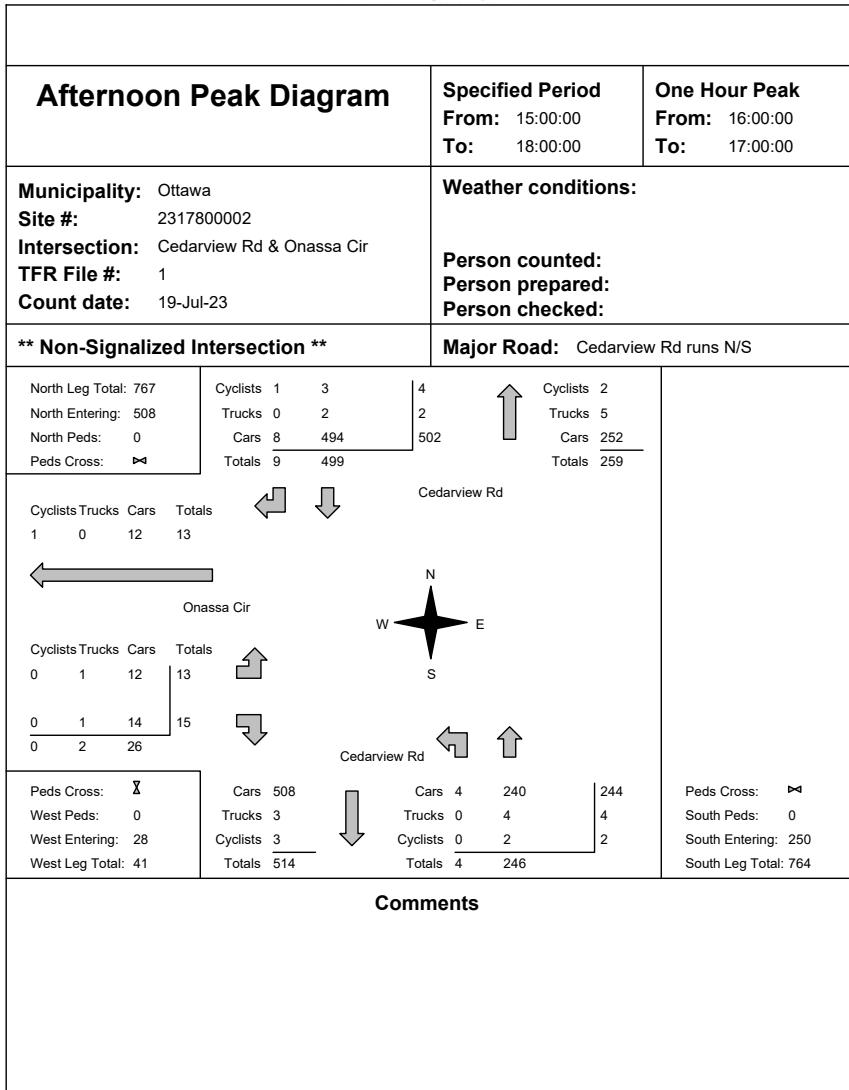


Revision Date: June 2023

Appendix B

Turning Movement Counts







Traffic Count Summary

Intersection: Cedarview Rd & Onassa Cir				Count Date: 19-Jul-23				Municipality: Ottawa							
North Approach Totals								South Approach Totals							
Hour Ending	Includes Cars, Trucks, & Cyclists				North/South Total Approaches	Includes Cars, Trucks, & Cyclists				Total Peds					
	Left	Thru	Right	Grand Total		Left	Thru	Right	Grand Total						
7:00:00	0	0	0	0	0	7:00:00	0	0	0	0					
8:00:00	0	171	16	187	0	8:00:00	7	254	0	261	0				
9:00:00	0	202	12	214	0	9:00:00	12	342	0	354	0				
10:00:00	0	195	13	208	0	10:00:00	9	262	0	271	0				
12:00:00	0	129	2	131	0	12:00:00	2	97	0	99	0				
13:00:00	0	303	12	315	0	13:00:00	14	178	0	192	0				
15:00:00	0	132	1	133	0	15:00:00	5	109	0	114	0				
16:00:00	0	404	7	411	0	16:00:00	9	240	0	249	0				
17:00:00	0	499	9	508	0	17:00:00	4	246	0	250	0				
18:00:00	0	480	5	485	0	18:00:00	3	233	0	236	0				
Totals:	0	2515	77	2592	0	4618	S Totals:	65	1961	0	2026	0			
East Approach Totals								West Approach Totals							
Hour Ending	Includes Cars, Trucks, & Cyclists				East/West Total Approaches	Includes Cars, Trucks, & Cyclists				Total Peds					
	Left	Thru	Right	Grand Total		Left	Thru	Right	Grand Total						
7:00:00	0	0	0	0	0	7:00:00	0	0	0	0					
8:00:00	0	0	0	0	10	8:00:00	6	0	4	10	1				
9:00:00	0	0	0	0	9	9:00:00	4	0	5	9	0				
10:00:00	0	0	0	0	24	10:00:00	16	0	8	24	0				
12:00:00	0	0	0	0	19	12:00:00	12	0	7	19	0				
13:00:00	0	0	0	0	15	13:00:00	6	0	9	15	0				
15:00:00	0	0	0	0	10	15:00:00	9	0	1	10	0				
16:00:00	0	0	0	0	16	16:00:00	9	0	7	16	0				
17:00:00	0	0	0	0	28	17:00:00	13	0	15	28	0				
18:00:00	0	0	0	0	14	18:00:00	7	0	7	14	0				
Totals:	0	0	0	0	145	W Totals:	82	0	63	145	1				
Calculated Values for Traffic Crossing Major Street															
Hours Ending:	8:00	10:00	12:00	13:00		15:00	16:00	17:00	18:00						
Crossing Values:	6	16	12	6		9	9	13	7						

Count Date: 19-Jul-23 Site #: 2317800002																
Interval Time	Passenger Cars - North Approach				Trucks - North Approach				Cyclists - North Approach				Pedestrians			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	North Cross	Cum	Incr	
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:15:00	0	0	32	32	4	4	0	0	0	1	1	0	0	0	0	
7:30:00	0	0	82	50	9	5	0	0	1	1	0	0	0	0	0	
7:45:00	0	0	120	38	12	3	0	0	3	2	1	0	0	0	0	
8:00:00	0	0	164	44	15	3	0	0	3	1	0	0	0	0	0	
8:15:00	0	0	211	47	18	3	0	0	6	0	2	1	0	0	0	
8:30:00	0	0	258	47	21	3	0	0	8	2	3	1	0	0	0	
8:45:00	0	0	312	54	24	3	0	0	9	1	3	0	0	0	0	
9:00:00	0	0	361	49	25	1	0	0	11	2	3	0	0	0	0	
9:15:00	0	0	414	53	28	3	0	0	11	0	4	1	0	0	0	
9:30:00	0	0	469	53	28	3	0	0	12	1	4	0	0	1	0	
9:45:00	0	0	508	45	35	2	0	0	14	2	4	0	0	1	0	
10:00:00	0	0	552	44	36	1	0	0	15	1	4	0	0	1	0	
10:15:00	0	0	552	0	36	0	0	0	15	0	4	0	0	1	0	
11:30:00	0	0	552	0	36	0	0	0	15	0	4	0	0	1	0	
11:45:00	0	0	612	60	37	1	0	0	15	0	4	0	0	1	0	
12:00:00	0	0	678	66	38	1	0	0	18	3	4	0	0	1	0	
12:15:00	0	0	749	71	41	2	0	0	18	0	5	0	0	2	1	
12:30:00	0	0	831	82	45	5	0	0	18	0	5	1	0	2	0	
12:45:00	0	0	908	77	46	1	0	0	19	1	5	0	0	3	1	
13:00:00	0	0	977	69	48	2	0	0	20	1	5	0	0	3	0	
13:30:00	0	0	1104	67	49	0	0	0	25	2	5	0	0	3	0	
13:45:00	0	0	1104	0	0	0	0	0	25	0	5	0	0	2	0	
15:00:00	0	0	1194	99	49	0	0	0	25	0	5	0	0	5	0	
15:30:00	0	0	1301	107	50	1	0	0	25	0	5	0	0	3	0	
15:45:00	0	0	1397	96	53	3	0	0	26	1	5	0	0	3	0	
16:00:00	0	0	1507	110	56	3	0	0	26	0	5	0	0	3	0	
16:15:00	0	0	1627	120	58	2	0	0	26	0	5	0	0	4	1	
16:30:00	0	0	1748	119	60	2	0	0	26	0	5	0	0	4	0	
16:45:00	0	0	1862	93	62	2	0	0	27	1	5	0	0	5	1	
17:00:00	0	0	2001	119	64	2	0	0	28	1	5	0	0	6	1	
17:15:00	0	0	2114	113	65	1	0	0	28	0	5	0	0	6	0	
17:30:00	0	0	2237	123	66	1	0	0	28	0	5	0	0	3	0	
17:45:00	0	0	2350	113	68	2	0	0	28	0	5	0	0	8	2	
18:00:00	0	0	2478	128	69	1	0	0	28	0	5	0	0	9	1	
18:15:00	0	0	2478	0	69	0	0	0	28	0	5	0	0	9	0	
18:15:15	0	0	2478	0	69	0	0	0	28	0	5	0	0	3	0	



Count Date: 19-Jul-23 Site #: 2317800002														
Interval Time	Passenger Cars - East Approach				Trucks - East Approach				Cyclists - East Approach				Pedestrians	
	Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Count Date: 19-Jul-23 Site #: 2317800002														
Interval Time	Passenger Cars - South Approach				Trucks - South Approach				Cyclists - South Approach				Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	3	3	39	39	0	0	1	1	0	0	0	0	0	0
7:30:00	5	2	99	60	0	0	1	1	0	0	0	0	2	2
7:45:00	6	1	165	67	0	0	1	0	1	0	0	0	4	2
8:00:00	6	0	249	83	0	0	1	0	1	0	0	0	4	0
8:15:00	10	4	307	58	0	0	1	0	3	2	0	0	6	2
8:30:00	11	1	399	92	0	0	1	0	5	2	0	0	8	2
8:45:00	14	3	481	82	0	0	1	0	5	0	0	0	10	2
9:00:00	17	3	580	99	0	0	2	1	6	1	0	0	0	0
9:15:00	18	1	636	56	0	0	2	0	6	0	0	0	12	2
9:30:00	7	3	686	0	0	0	3	1	0	0	0	0	1	0
9:45:00	23	2	773	69	0	0	3	0	7	0	0	0	15	2
10:00:00	25	2	834	61	0	0	3	0	7	0	0	0	17	2
10:15:00	25	0	834	0	0	0	3	0	7	0	0	0	17	0
11:30:00	25	0	834	0	0	0	3	0	7	0	0	0	17	0
11:45:00	26	1	881	47	0	0	3	0	7	0	0	0	17	0
12:00:00	27	1	931	59	0	0	3	0	7	0	0	0	17	0
12:15:00	29	2	973	47	0	0	3	0	7	0	0	0	17	0
12:30:00	34	5	1012	34	0	0	3	0	7	0	0	0	18	1
12:45:00	38	4	1053	41	0	0	3	0	8	1	0	0	19	1
13:00:00	41	3	1105	52	0	0	3	0	8	0	0	0	20	1
13:15:00	43	2	1158	53	0	0	4	1	9	1	0	0	21	1
13:30:00	45	2	1212	54	0	0	4	0	9	0	0	0	21	0
13:45:00	45	0	1212	0	0	0	4	0	9	0	0	0	21	0
15:00:00	45	0	1262	0	0	0	4	0	9	0	0	0	21	0
15:15:00	46	1	1260	48	0	0	5	1	10	1	0	0	21	0
15:30:00	47	1	1304	44	0	0	5	0	12	2	0	0	22	1
15:45:00	53	6	1377	73	0	0	5	0	12	0	0	0	23	1
16:00:00	53	0	1446	69	0	0	5	0	12	0	0	0	24	1
16:15:00	53	0	1491	45	0	0	5	0	14	2	0	0	24	0
16:30:00	54	1	1552	62	0	0	5	1	15	1	0	0	25	1
16:45:00	56	2	1618	66	0	0	5	0	15	0	0	0	26	1
17:00:00	57	1	1686	67	0	0	5	0	16	1	0	0	26	0
17:15:00	58	1	1738	52	0	0	5	0	18	2	0	0	27	1
17:30:00	58	0	1794	56	0	0	5	0	19	1	0	0	28	1
17:45:00	60	2	1856	62	0	0	5	0	19	0	0	0	30	2
18:00:00	60	0	1910	54	0	0	5	0	19	0	0	0	32	2
18:15:00	60	0	1910	0	0	0	5	0	19	0	0	0	32	0
18:30:00	60	0	1910	0	0	0	5	0	19	0	0	0	32	0
18:45:00	60	0	1910	0	0	0	5	0	19	0	0	0	32	0



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CEDARVIEW RD @ FALLOWFIELD RD

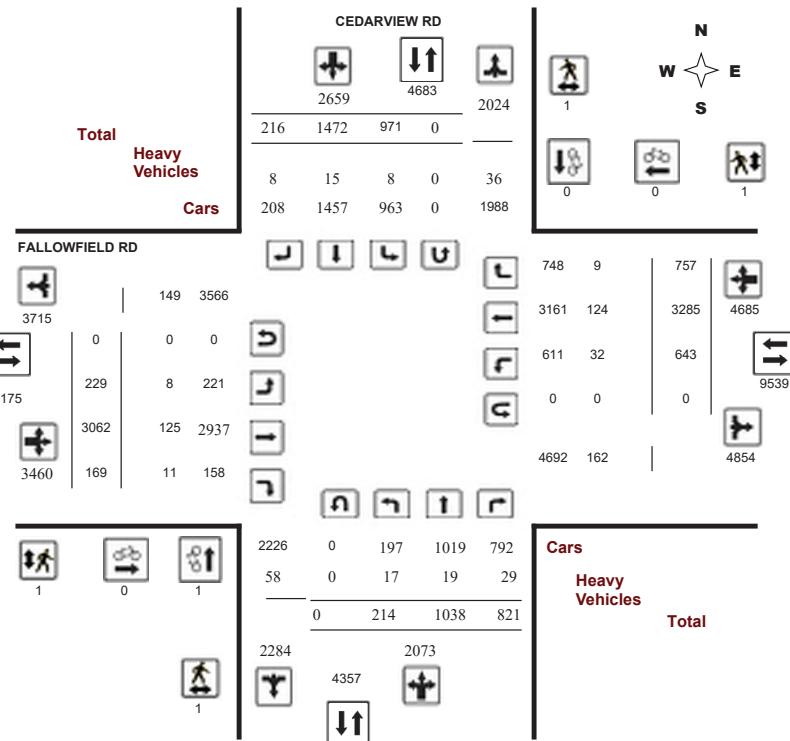
Survey Date: Tuesday, January 07, 2020

WO No: 39248

Start Time: 07:00

Miovision

Full Study Diagram



5469190 - TUE JAN 07 2020 - 8HRS - LORETTA



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CEDARVIEW RD @ FALLOWFIELD RD

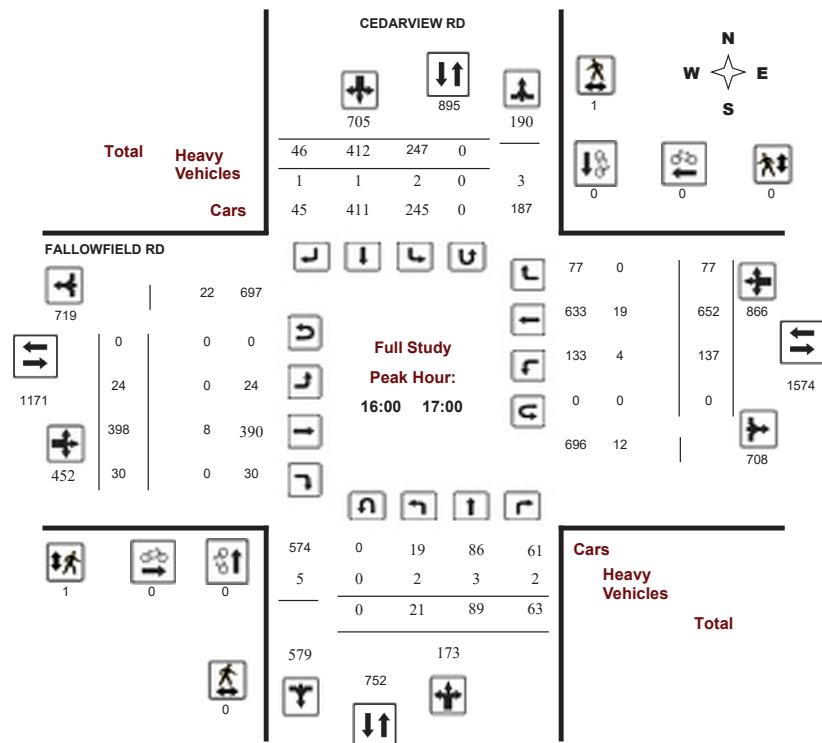
Survey Date: Tuesday, January 07, 2020

Start Time: 07:00

WO No: 39248

Device: Miovision

Full Study Peak Hour Diagram



5469190 - TUE JAN 07 2020 - 8HRS - LORETTA



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

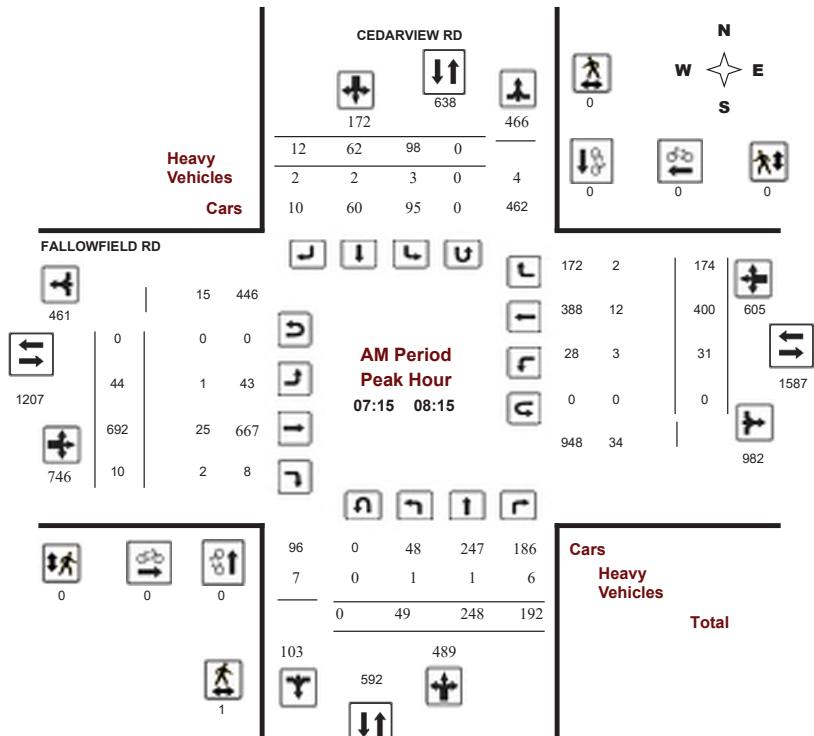
CEDARVIEW RD @ FALLOWFIELD RD

Survey Date: Tuesday, January 07, 2020

Start Time: 07:00

WO No: 39248

Device: Miovision



Comments 5469190 - TUE JAN 07 2020 - 8HRS - LORETTA



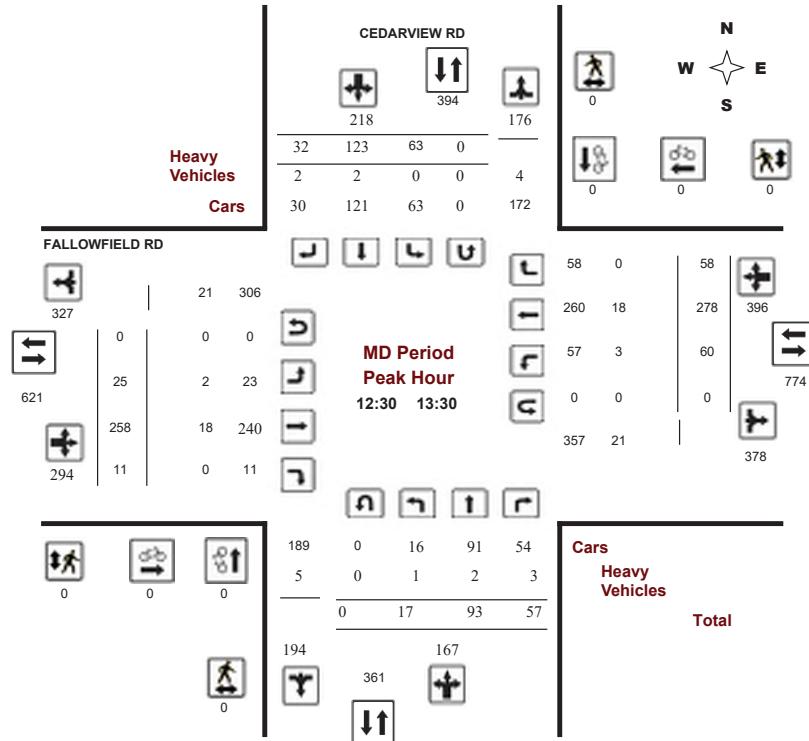
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CEDARVIEW RD @ FALLOWFIELD RD

Survey Date: Tuesday, January 07, 2020
Start Time: 07:00

WO No: 39248
Device: Miovision



Comments 5469190 - TUE JAN 07 2020 - 8HRS - LORETTA



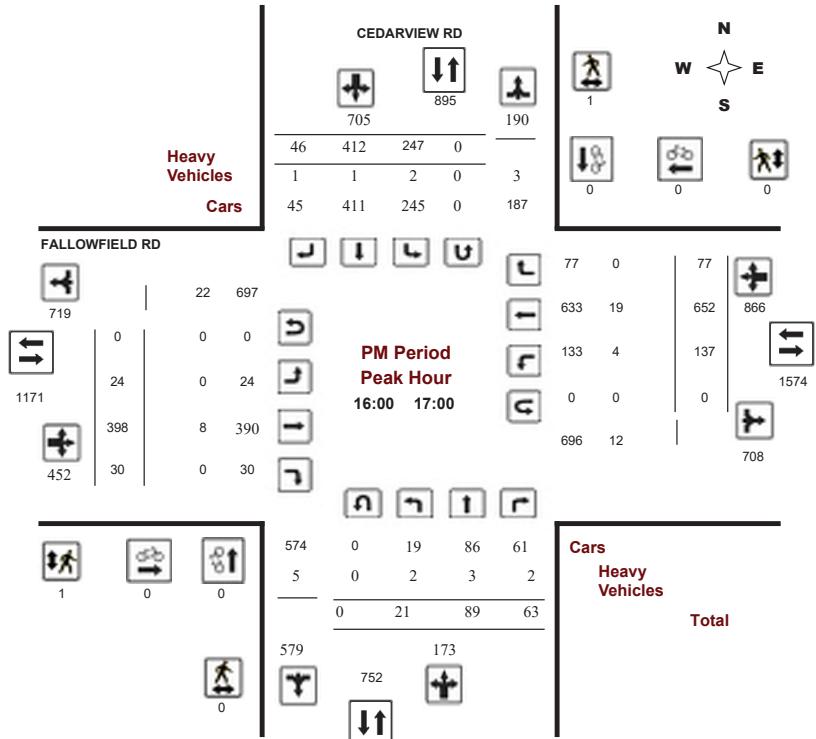
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

CEDARVIEW RD @ FALLOWFIELD RD

Survey Date: Tuesday, January 07, 2020
Start Time: 07:00

WO No: 39248
Device: Miovision



Comments 5469190 - TUE JAN 07 2020 - 8HRS - LORETTA



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CEDARVIEW RD @ FALLOWFIELD RD

Survey Date: Tuesday, January 07, 2020

WO No: 39248

Start Time: 07:00

Device: Miovision

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, January 07, 2020

Total Observed U-Turns

AADT Factor

Northbound: 0	Southbound: 0	1.10
Eastbound: 0	Westbound: 0	

CEDARVIEW RD												FALLOWFIELD RD												
Period	Northbound			Southbound			Eastbound			Westbound			WB TOT	STR TOT	Grand Total									
	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT											
07:00 08:00	38	233	186	457	75	50	10	135	592	45	684	10	739	25	331	149	505	1244	1836					
08:00 09:00	47	229	170	446	100	71	11	182	628	37	497	14	548	48	409	190	647	1195	1823					
09:00 10:00	27	132	102	261	45	67	17	129	390	30	267	16	313	57	279	101	437	750	1140					
11:30 12:30	14	81	69	164	64	110	32	206	370	22	257	17	296	60	274	60	394	690	1060					
12:30 13:30	17	93	57	167	63	123	32	218	385	25	258	11	294	60	278	58	396	690	1075					
15:00 16:00	32	88	96	216	176	252	36	464	680	25	318	31	374	118	540	71	729	1103	1783					
16:00 17:00	21	89	63	173	247	412	46	705	878	24	398	30	452	137	652	77	866	1318	2196					
17:00 18:00	18	93	78	189	201	387	32	620	809	21	383	40	444	138	522	51	711	1155	1964					
Sub Total	214	1038	821	2073	971	1472	216	2659	4732	229	3062	169	3460	643	3285	757	4685	8145	12877					
U Turns				0		0	0				0			0	0	0								
Total	214	1038	821	2073	971	1472	216	2659	4732	229	3062	169	3460	643	3285	757	4685	8145	12877					
EQ 12Hr	297	1443	1141	2881	1350	2046	300	3696	6577	318	4256	235	4809	894	4566	1052	6512	11322	17899					

Note: These values are calculated by multiplying the totals by the appropriate expansion factor.

1.39

AVG 12Hr 327 1587 1255 3169 1485 2948 433 4066 7235 350 4682 258 5290 983 5023 1157 7163 12454 19689

Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.

1.10

AVG 24Hr 428 2079 1644 4151 1945 3862 567 5326 9478 458 6133 338 6930 1288 6580 1516 9384 16315 25793

Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.

1.31

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CEDARVIEW RD @ FALLOWFIELD RD

Survey Date: Tuesday, January 07, 2020

WO No: 39248

Start Time: 07:00

Device: Miovision

Full Study 15 Minute Increments

CEDARVIEW RD FALLOWFIELD RD

Time Period	Northbound			Southbound			Eastbound			Westbound			LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
	N TOT	LT	ST	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT										
07:00	07:15	4	47	48	99	5	6	0	11	110	8	141	3	152	4	42	26	72	224	334		
07:15	07:30	8	62	43	113	21	7	3	31	144	18	201	2	221	6	90	39	135	356	500		
07:30	07:45	12	61	55	128	27	20	3	50	178	11	177	4	192	7	98	42	147	339	517		
07:45	08:00	14	63	40	117	22	17	4	43	160	8	165	1	174	8	101	42	151	325	485		
08:00	08:15	15	62	54	131	28	18	2	48	179	7	149	3	159	10	111	51	172	331	510		
08:15	08:30	13	57	47	117	20	14	4	38	155	11	139	2	152	7	91	40	138	290	445		
08:30	08:45	11	61	39	111	24	16	2	42	153	10	113	2	125	14	120	53	187	312	465		
08:45	09:00	8	49	30	87	28	23	3	54	141	9	96	7	112	17	87	46	150	262	403		
09:00	09:15	15	49	33	97	19	20	3	42	139	14	87	6	107	22	110	33	165	272	411		
09:15	09:30	6	30	26	62	10	17	4	31	93	4	70	1	75	16	67	26	109	184	277		
09:30	09:45	4	22	24	50	8	14	7	29	79	8	56	5	69	10	58	26	94	163	242		
09:45	10:00	2	31	19	52	8	16	3	27	79	4	54	4	62	9	44	16	69	131	210		
10:00	11:45	3	21	15	39	22	28	4	54	93	3	60	5	68	15	69	14	98	166	259		
11:45	12:00	3	25	17	45	10	27	7	44	89	6	68	3	77	15	74	12	101	178	267		
12:00	12:15	3	21	18	42	20	32	13	65	107	6	53	7	66	12	62	20	94	160	267		
12:15	12:30	5	14	19	38	12	23	8	43	81	7	76	2	85	18	69	14	101	186	267		
12:30	12:45	4	35	12	51	17	35	8	60	111	8	65	1	74	9	63	14	86	160	271		
12:45	13:00	7	19	13	39	17	37	4	58	97	9	67	2	78	13	66	13	92	170	267		
13:00	13:15	4	21	17	42	17	25	7	49	91	1	52	3	56	21	66	19	106	162	253		
13:15	13:30	2	18	15	35	12	26	13	51	86	7	74	5	86	17	83	12	112	198	284		
15:00	15:15	7	19	21	47	52	8	107	154	7	72	6	85	33	114	23	170	255	409			
15:15	15:30	5	35	17	57	43	65	7	115	172	4	69	6	79	19	134	16	169	248	420		
15:30	15:45	11	16	20	47	27	57	6	90	137	6	87	10	103	30	150	13	193	296	433		
15:45	16:00	9	18	38	65	59	78	15	152	217	8	90	9	107	36	142	19	197	304	521		
16:00	16:15	11	14	16	41	51	97	12	160	201	6	96	7	109	35	168	21	224	333	534		
16:15	16:30	5	30	10	45	74	126	12	212	257	5	92	9	106	37	158	17	212	318	575		
16:30	16:45	4	28	17	49	43	85	14	142	191	8	104	6	118	33	171	23	227	345	536		
16:45	17:00	1	17	20	38	79	104	8	191	229	5	106	8	119	32	155	16	203	322	551		
17:00	17:15	8	32	13	53	49	105	8	162	215	5	100	11	116	28	139	14	181	297	512		
17:15	17:30	5	13	17	35	49	106	14	169	204	9	112	15	136	42	136	10	188	324	528		
17:30	17:45	2	24	28	54	52	98	6	156	210	4	93	7	104	38	134	16	188	292	502		
17:45	18:00	3	24	20	47	51	78	4	133	180	3	78	7	88	30	113	11	154	242	422		
	Total:	214	1038	821	2073	971	1472	216	2659	4732	229	3062	169	3460	643	3285	757	4685	8145	12,877		

Note: U-Turns are included in Totals.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CEDARVIEW RD @ FALLOWFIELD RD

Survey Date: Tuesday, January 07, 2020

Start Time: 07:00

WO No: 39248

Device: Miovision

Full Study Cyclist Volume

CEDARVIEW RD

FALLOWFIELD RD

Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00 07:15	0	0	0	0	0	0	0
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	0	0	0	0	0	0	0
07:45 08:00	0	0	0	0	0	0	0
08:00 08:15	0	0	0	0	0	0	0
08:15 08:30	0	0	0	0	0	0	0
08:30 08:45	0	0	0	0	0	0	0
08:45 09:00	0	0	0	0	0	0	0
09:00 09:15	0	0	0	0	0	0	0
09:15 09:30	0	0	0	0	0	0	0
09:30 09:45	0	0	0	0	0	0	0
09:45 10:00	0	0	0	0	0	0	0
11:30 11:45	0	0	0	0	0	0	0
11:45 12:00	0	0	0	0	0	0	0
12:00 12:15	0	0	0	0	0	0	0
12:15 12:30	0	0	0	0	0	0	0
12:30 12:45	0	0	0	0	0	0	0
12:45 13:00	0	0	0	0	0	0	0
13:00 13:15	0	0	0	0	0	0	0
13:15 13:30	0	0	0	0	0	0	0
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	1	0	1	0	0	0	1
17:45 18:00	0	0	0	0	0	0	0
Total	1	0	1	0	0	0	1



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CEDARVIEW RD @ FALLOWFIELD RD

Survey Date: Tuesday, January 07, 2020

Start Time: 07:00

WO No:

39248

Device:

Miovision

Full Study Pedestrian Volume

CEDARVIEW RD

FALLOWFIELD RD

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	0	0	0	0	0	0
07:15 07:30	1	0	1	0	0	0	1
07:30 07:45	0	0	0	0	0	0	0
07:45 08:00	0	0	0	0	0	0	0
08:00 08:15	0	0	0	0	0	0	0
08:15 08:30	0	0	0	0	0	0	0
08:30 08:45	0	0	0	0	0	0	0
08:45 09:00	0	0	0	0	0	0	0
09:00 09:15	0	0	0	0	0	0	0
09:15 09:30	0	0	0	0	0	0	0
09:30 09:45	0	0	0	0	0	0	0
09:45 10:00	0	0	0	0	0	0	0
11:30 11:45	0	0	0	0	0	0	0
11:45 12:00	0	0	0	0	0	0	0
12:00 12:15	0	0	0	0	0	0	0
12:15 12:30	0	0	0	0	0	0	0
12:30 12:45	0	0	0	0	0	0	0
12:45 13:00	0	0	0	0	0	0	0
13:00 13:15	0	0	0	0	0	0	0
13:15 13:30	0	0	0	0	0	0	0
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	1	1	1
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	1	1	0	0	0	1
16:30 16:45	0	0	0	1	0	1	1
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	1	1	2	1	1	2	4

5469190 - TUE JAN 07 2020 - 8HRS - LORETTA



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CEDARVIEW RD @ FALLOWFIELD RD

Survey Date: Tuesday, January 07, 2020

WO No: 39248

Start Time: 07:00

Device: Miovision

Full Study Heavy Vehicles

CEDARVIEW RD

FALLOWFIELD RD

Time Period	Northbound			Southbound			Eastbound			Westbound			Grand Total								
	LT	ST	RT	N	LT	ST	RT	S	STR	LT	ST	RT	E	LT	ST	RT	W	STR	LT	ST	RT
	LT	ST	TOT	LT	ST	RT	TOT	TOT	LT	ST	RT	TOT	LT	ST	RT	TOT	TOT	LT	ST	RT	
07:00	07:15	0	0	3	6	0	0	0	0	6	0	5	2	9	1	2	0	11	20	13	
07:15	07:30	0	0	0	0	0	0	1	1	0	7	0	11	0	4	1	12	23	12		
07:30	07:45	0	0	3	6	1	0	0	2	8	0	7	2	11	1	2	1	15	26	17	
07:45	08:00	0	0	0	1	0	1	0	1	2	0	7	0	11	0	4	0	11	22	12	
08:00	08:15	1	1	3	8	2	1	2	7	15	1	4	0	10	2	2	0	13	23	19	
08:15	08:30	1	1	0	2	0	0	0	4	6	1	7	0	11	0	2	2	11	22	14	
08:30	08:45	0	0	2	5	0	2	0	2	7	0	6	0	9	1	3	0	12	21	14	
08:45	09:00	1	0	0	4	0	0	0	0	4	0	3	2	14	1	8	0	12	26	15	
09:00	09:15	9	3	3	17	0	0	1	4	21	0	2	0	29	2	17	0	24	53	37	
09:15	09:30	0	1	0	1	1	0	0	3	4	0	6	0	13	0	7	1	15	28	16	
09:30	09:45	0	1	1	4	0	1	0	4	8	1	2	0	5	1	2	1	7	12	10	
09:45	10:00	0	0	0	1	0	1	1	4	5	0	5	0	7	0	1	2	8	15	10	
10:00	11:15	0	0	1	2	1	0	0	1	3	0	7	0	12	1	5	0	15	27	15	
11:15	11:30	0	0	1	2	1	0	0	1	3	0	7	0	12	1	5	0	15	27	15	
11:30	11:45	0	0	1	2	1	0	0	1	3	0	7	0	12	1	5	0	15	27	15	
11:45	12:00	0	3	0	6	0	1	1	5	11	0	3	1	11	1	6	0	10	21	16	
12:00	12:15	0	0	2	4	0	1	0	2	6	0	5	0	5	1	0	1	9	14	10	
12:15	12:30	0	0	0	0	0	0	0	0	0	0	2	0	5	0	3	0	5	10	5	
12:30	12:45	0	1	2	6	0	1	0	3	9	1	2	0	7	2	4	0	10	17	13	
12:45	13:00	1	0	0	1	0	0	1	2	3	1	4	0	9	0	2	0	6	15	9	
13:00	13:15	0	1	1	3	0	0	0	1	4	0	5	0	9	1	4	0	11	20	12	
13:15	13:30	0	0	0	1	0	1	1	2	3	0	7	0	16	0	8	0	15	31	17	
13:30	13:45	0	0	0	2	1	0	0	1	3	0	6	1	14	1	7	0	15	29	16	
13:45	14:00	0	1	0	4	0	1	0	2	6	0	4	1	8	1	3	0	8	16	11	
14:00	14:15	0	0	1	4	0	0	0	0	4	0	2	2	6	1	2	0	6	12	8	
14:15	14:30	1	0	2	8	0	2	0	3	11	1	1	0	5	3	2	0	8	13	12	
14:30	14:45	1	0	1	2	0	0	0	0	2	0	2	0	9	0	6	0	9	18	10	
14:45	15:00	1	0	0	2	0	0	0	0	2	0	2	0	8	1	5	0	8	16	9	
15:00	15:15	0	2	1	5	0	0	1	3	8	0	2	0	10	2	7	0	12	22	15	
15:15	15:30	0	1	0	3	2	1	0	4	7	0	2	0	3	1	1	0	6	9	8	
15:30	15:45	0	1	1	4	0	1	0	2	6	0	3	0	4	1	1	0	6	10	8	
15:45	16:00	1	0	2	8	0	2	0	3	11	1	1	0	5	3	2	0	8	13	12	
16:00	16:15	1	0	1	2	0	0	0	0	2	0	2	0	9	0	6	0	9	18	10	
16:15	16:30	1	0	0	2	0	0	0	0	2	0	2	0	8	1	5	0	8	16	9	
16:30	16:45	0	2	1	5	0	0	1	3	8	0	2	0	10	2	7	0	12	22	15	
16:45	17:00	0	1	0	3	2	1	0	4	7	0	2	0	3	1	1	0	6	9	8	
17:00	17:15	0	1	1	4	0	1	0	2	6	0	3	0	4	1	1	0	6	10	8	
17:15	17:30	1	0	0	4	0	0	0	1	5	1	1	0	3	3	0	0	4	7	6	
17:30	17:45	0	2	1	5	0	0	0	2	7	0	2	0	5	2	3	0	8	13	10	
17:45	18:00	0	0	1	2	0	0	0	1	3	1	2	0	4	1	1	0	5	9	6	
Total:	None	17	19	29	123	8	15	8	67	190	8	125	11	293	32	124	9	327	620	405	



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CEDARVIEW RD @ FALLOWFIELD RD

Survey Date: Tuesday, January 07, 2020

WO No: 39248

Start Time: 07:00

Device: Miovision

Full Study 15 Minute U-Turn Total

CEDARVIEW RD

FALLOWFIELD RD

Time Period	Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0
07:15	07:30	0	0	0	0
07:30	07:45	0	0	0	0
07:45	08:00	0	0	0	0
08:00	08:15	0	0	0	0
08:15	08:30	0	0	0	0
08:30	08:45	0	0	0	0
08:45	09:00	0	0	0	0
09:00	09:15	0	0	0	0
09:15	09:30	0	0	0	0
09:30	09:45	0	0	0	0
09:45	10:00	0	0	0	0
10:00	11:15	0	0	0	0
11:15	11:30	0	0	0	0
11:30	11:45	0	0	0	0
11:45	12:00	0	0	0	0
12:00	12:15	0	0	0	0
12:15	12:30	0	0	0	0
12:30	12:45	0	0	0	0
12:45	13:00	0	0	0	0
13:00	13:15	0	0	0	0
13:15	13:30	0	0	0	0
13:30	13:45	0	0	0	0
13:45	14:00	0	0	0	0
14:00	14:15	0	0	0	0
14:15	14:30	0	0	0	0
14:30	14:45	0	0	0	0
14:45	15:00	0	0	0	0
15:00	15:15	0	0	0	0
15:15	15:30	0	0	0	0
15:30	15:45	0	0	0	0
15:45	16:00	0	0	0	0
16:00	16:15	0	0	0	0
16:15	16:30	0	0	0	0
16:30	16:45	0	0	0	0
16:45	17:00	0	0	0	0
17:00	17:15	0	0	0	0
17:15	17:30	0	0	0	0
17:30	17:45	0	0	0	0
17:45	18:00	0	0	0	0
Total					
0					



Transportation Services - Traffic Services

Turning Movement Count - Study Results

FALLOWFIELD RD @ O'KEEFE CRT

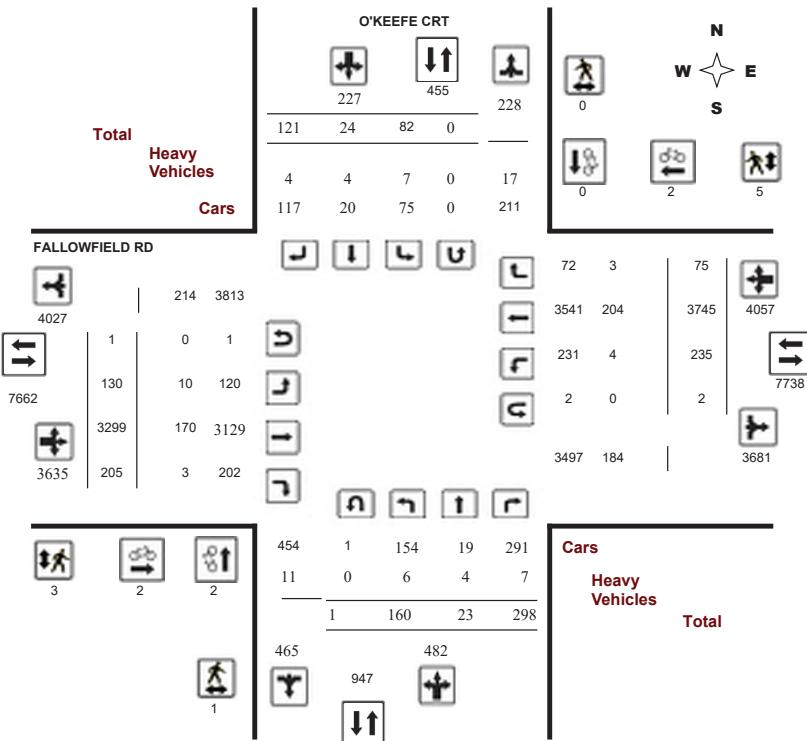
Survey Date: Wednesday, June 07, 2023

Start Time: 07:00

WO No: 40986

Device: Miovision

Full Study Diagram



Transportation Services - Traffic Services

Turning Movement Count - Study Results

FALLOWFIELD RD @ O'KEEFE CRT

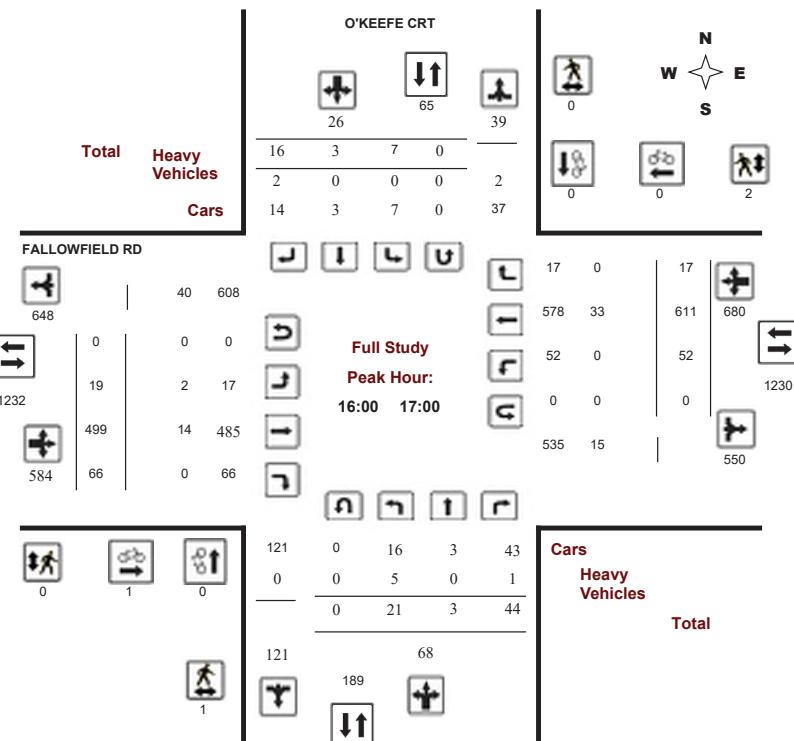
Survey Date: Wednesday, June 07, 2023

Start Time: 07:00

WO No: 40986

Device: Miovision

Full Study Peak Hour Diagram





Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

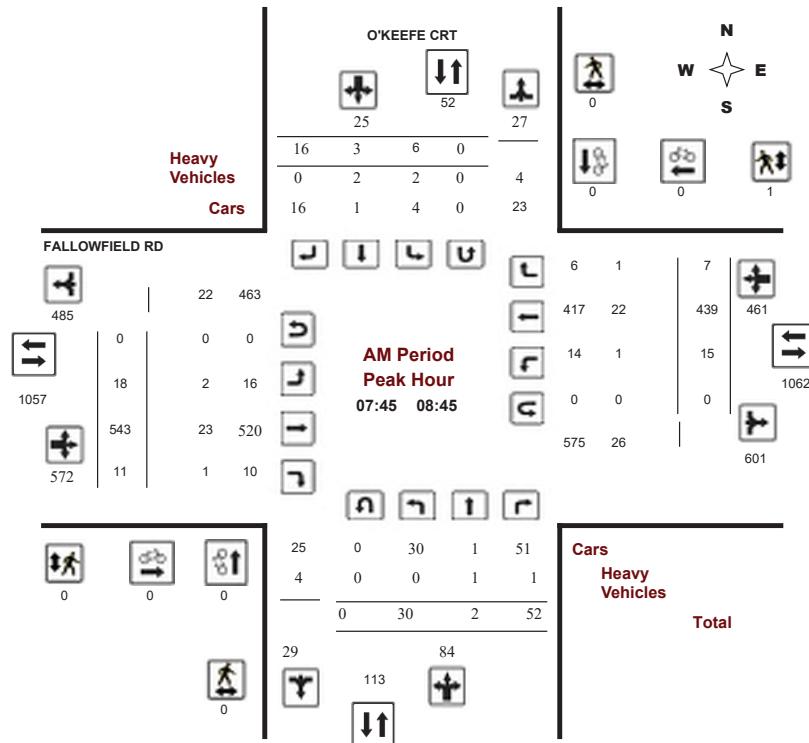
FALLOWFIELD RD @ O'KEEFE CRT

Survey Date: Wednesday, June 07, 2023

Start Time: 07:00

WO No: 40986

Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

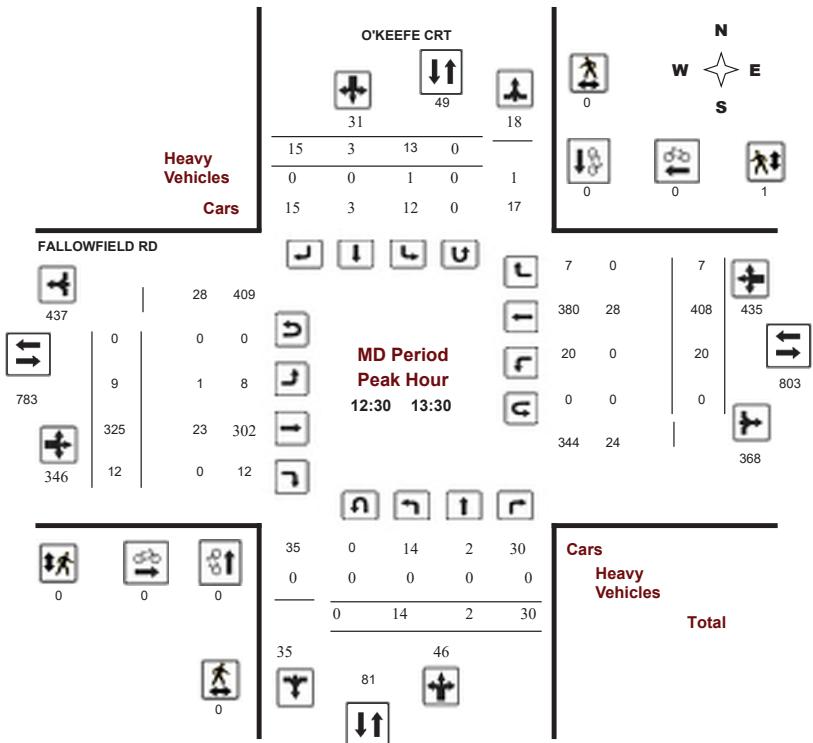
FALLOWFIELD RD @ O'KEEFE CRT

Survey Date: Wednesday, June 07, 2023

Start Time: 07:00

WO No: 40986

Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

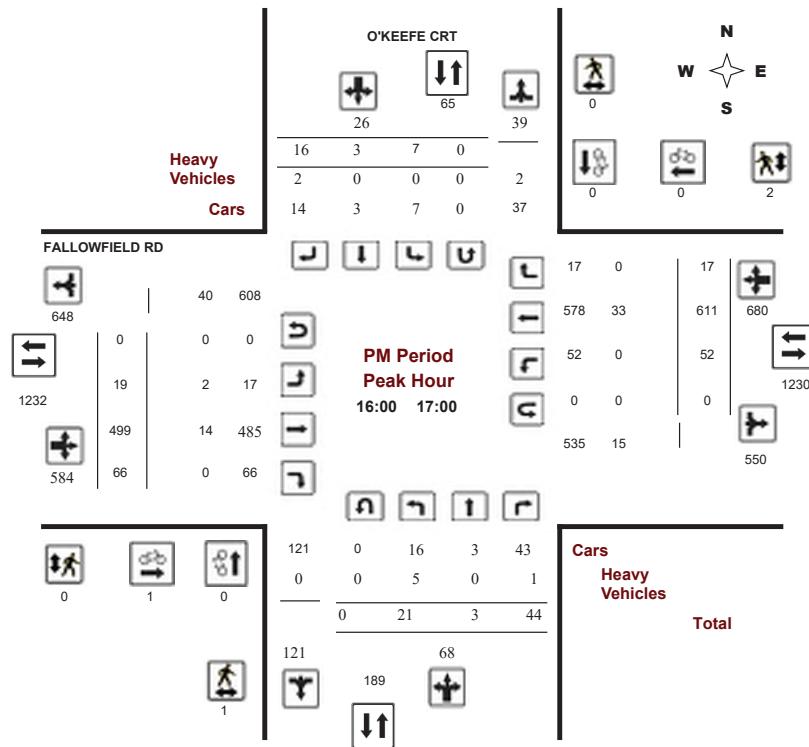
FALLOWFIELD RD @ O'KEEFE CRT

Survey Date: Wednesday, June 07, 2023

Start Time: 07:00

WO No: 40986

Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Study Results

FALLOWFIELD RD @ O'KEEFE CRT

Survey Date: Wednesday, June 07, 2023

WO No: 40986

Start Time: 07:00

Device: Miovision

Full Study Summary (8 HR Standard)

Survey Date: Wednesday, June 07, 2023

Total Observed U-Turns

AADT Factor

Northbound:	1	Southbound:	0	.90
Eastbound:	1	Westbound:	2	

O'KEEFE CRT								FALLOWFIELD RD											
Period	Northbound			Southbound			SB TOT	STR TOT	Eastbound			Westbound			WB TOT	STR TOT	Grand Total		
	LT	ST	RT	LT	ST	RT			LT	ST	RT	EB TOT	LT	ST	RT				
07:00 - 08:00	27	1	42	70	20	1	18	39	109	18	453	13	484	6	411	8	425	909	1018
08:00 - 09:00	33	2	51	86	9	6	16	31	117	12	497	13	522	19	437	7	463	985	1102
09:00 - 10:00	20	3	34	57	9	3	13	25	82	9	340	17	366	24	417	12	453	819	901
11:30 - 12:30	13	4	21	38	10	3	22	35	73	18	309	12	339	22	359	9	390	729	802
12:30 - 13:30	14	2	30	46	13	3	15	31	77	9	325	12	346	20	408	7	435	781	858
15:00 - 16:00	14	4	37	55	6	2	5	13	68	25	414	31	470	38	563	7	608	1078	1146
16:00 - 17:00	21	3	44	68	7	3	16	26	94	19	499	66	584	52	611	17	680	1264	1358
17:00 - 18:00	18	4	39	61	8	3	16	27	88	20	462	41	523	54	539	8	601	1124	1212
Sub Total	160	23	298	481	82	24	121	227	708	130	3299	205	3634	235	3745	75	4055	7689	8397
U Turns									0	1						2	3	4	
Total	160	23	298	482	82	24	121	227	709	130	3299	205	3635	235	3745	75	4057	7692	8401
EQ 12Hr	222	32	414	670	114	33	168	316	986	181	4586	285	5053	327	5206	104	5639	10692	11677
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.																1.39			
AVG 12Hr	200	29	373	603	103	39	198	284	887	163	4127	256	4548	294	4685	94	5075	9623	10509
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.																.90			
AVG 24Hr	262	38	489	790	135	51	259	372	1162	214	5406	335	5958	385	6137	123	6648	12606	13767
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.																1.31			
Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.																			

Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

FALLOWFIELD RD @ O'KEEFE CRT

Survey Date: Wednesday, June 07, 2023

WO No: 40986

Start Time: 07:00

Device: Miovision

Full Study 15 Minute Increments

O'KEEFE CRT

Time Period	Northbound				Southbound				Eastbound				Westbound				Grand Total		
	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	
07:00 - 07:15	5	1	15	21	5	0	2	7	28	3	68	3	74	2	95	0	97	171	199
07:15 - 07:30	8	0	7	15	7	1	3	11	26	2	98	3	103	3	96	4	103	206	232
07:30 - 07:45	9	0	11	20	7	0	7	14	34	5	134	3	142	1	109	1	111	253	287
07:45 - 08:00	5	0	9	14	1	0	6	7	21	8	153	4	165	0	111	3	114	279	300
08:00 - 08:15	7	0	15	22	2	2	1	5	27	4	136	1	141	4	85	0	89	230	257
08:15 - 08:30	10	1	15	26	3	1	5	9	35	4	144	4	152	5	103	1	109	261	296
08:30 - 08:45	8	1	13	22	0	0	4	4	26	2	110	2	114	6	140	3	149	263	289
08:45 - 09:00	8	0	8	16	4	3	6	13	29	2	107	6	115	4	109	3	116	231	260
09:00 - 09:15	5	0	11	17	2	0	5	7	24	2	84	1	87	7	106	3	116	203	227
09:15 - 09:30	7	0	4	11	0	1	3	4	15	3	95	12	110	8	121	3	132	242	257
09:30 - 09:45	4	2	10	16	2	1	1	4	20	2	89	1	92	7	118	4	129	221	241
09:45 - 10:00	4	1	9	14	5	1	4	10	24	2	72	3	77	2	72	2	76	153	177
11:30 - 11:45	3	0	4	7	0	0	2	2	9	3	86	1	90	4	103	1	109	199	208
11:45 - 12:00	3	3	5	11	5	1	10	16	27	3	67	4	74	8	92	4	104	178	205
12:00 - 12:15	5	1	5	11	2	0	3	5	16	7	74	4	85	5	93	3	101	186	202
12:15 - 12:30	2	0	7	9	3	2	7	12	21	5	82	3	90	5	71	1	77	167	188
12:30 - 12:45	2	1	8	11	5	0	1	6	17	4	86	1	91	4	119	2	125	216	233
12:45 - 13:00	3	0	6	9	5	1	8	14	23	2	86	3	91	7	92	2	101	192	215
13:00 - 13:15	5	1	12	18	0	1	1	2	20	3	69	3	75	4	112	0	116	191	211
13:15 - 13:30	4	0	4	8	3	1	5	9	17	0	84	5	89	5	85	3	93	182	199
15:00 - 15:15	2	1	4	7	1	0	0	1	8	7	90	7	104	8	144	2	155	259	267
15:15 - 15:30	3	0	10	13	3	1	1	5	18	8	97	6	111	8	156	2	166	277	295
15:30 - 15:45	2	1	15	18	2	0	1	3	21	7	107	7	122	10	131	0	141	263	284
15:45 - 16:00	7	2	8	17	0	1	3	4	21	3	120	11	134	12	132	3	147	281	302
16:00 - 16:15	3	0	9	12	1	1	4	6	18	8	129	20	157	13	160	8	181	338	356
16:15 - 16:30	8	0	16	24	3	1	3	7	31	2	123	20	145	8	176	2	186	331	362
16:30 - 16:45	2	3	12	17	1	1	6	8	25	5	124	10	139	11	117	4	132	271	296
16:45 - 17:00	8	0	7	15	2	0	3	5	20	4	123	16	143	20	158	3	181	324	344
17:00 - 17:15	8	0	4	12	2	0	2	4	16	6	115	9	130	19	125	2	146	276	292
17:15 - 17:30	2	2	11	15	5	0	5	10	25	2	118	14	134	15	170	2	187	321	346
17:30 - 17:45	4	0	16	20	1	1	5	7	27	5	123	10	138	11	123	1	135	273	300
17:45 - 18:00	4	2	8	14	0	2	4	6	20	7	106	8	121	9	121	3	133	254	274
Total:	160	23	298	482	82	24	121	227	709	130	3299	205	3635	235	3745	75	4057	7692	8,401

Note: U-Turns are included in Totals.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

FALLOWFIELD RD @ O'KEEFE CRT

Survey Date: Wednesday, June 07, 2023

WO No: 40986

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

O'KEEFE CRT

FALLOWFIELD RD

Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00 - 07:15	0	0	0	0	0	0	0
07:15 - 07:30	0	0	0	0	1	1	1
07:30 - 07:45	0	0	0	0	0	0	0
07:45 - 08:00	0	0	0	0	0	0	0
08:00 - 08:15	0	0	0	0	0	0	0
08:15 - 08:30	0	0	0	0	0	0	0
08:30 - 08:45	0	0	0	0	0	0	0
08:45 - 09:00	0	0	0	0	0	0	0
09:00 - 09:15	0	0	0	0	0	0	0
09:15 - 09:30	0	0	0	0	0	0	0
09:30 - 09:45	0	0	0	0	0	0	0
09:45 - 10:00	0	0	0	0	0	0	0
10:00 - 10:15	0	0	0	0	0	0	0
11:30 - 11:45	0	0	0	0	0	0	0
11:45 - 12:00	0	0	0	0	0	0	0
12:00 - 12:15	0	0	0	0	0	0	0
12:15 - 12:30	0	0	0	1	0	1	1
12:30 - 12:45	0	0	0	0	0	0	0
12:45 - 13:00	0	0	0	0	0	0	0
13:00 - 13:15	0	0	0	0	0	0	0
13:15 - 13:30	0	0	0	0	0	0	0
13:30 - 13:45	0	0	0	0	0	0	0
14:45 - 15:00	0	0	0	0	0	0	0
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	2	0	2	0	0	0	2
15:45 - 16:00	0	0	0	1	0	1	1
16:00 - 16:15	0	0	0	1	0	1	1
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:	2	0	2	2	2	4	6



Transportation Services - Traffic Services

Turning Movement Count - Study Results

FALLOWFIELD RD @ O'KEEFE CRT

Survey Date: Wednesday, June 07, 2023

WO No: 40986

Start Time: 07:00

Device: Miovision

Full Study Pedestrian Volume

O'KEEFE CRT

FALLOWFIELD RD

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	0	0	1	1	2	2
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	0	0	0	1	0	1	1
07:45 08:00	0	0	0	0	0	0	0
08:00 08:15	0	0	0	0	1	1	1
08:15 08:30	0	0	0	0	0	0	0
08:30 08:45	0	0	0	0	0	0	0
08:45 09:00	0	0	0	0	0	0	0
09:00 09:15	0	0	0	0	0	0	0
09:15 09:30	0	0	0	0	0	0	0
09:30 09:45	0	0	0	0	0	0	0
09:45 10:00	0	0	0	0	0	0	0
10:00 11:45	0	0	0	0	0	0	0
11:45 12:00	0	0	0	0	0	0	0
12:00 12:15	0	0	0	0	0	0	0
12:15 12:30	0	0	0	0	0	0	0
12:30 12:45	0	0	0	0	1	1	1
12:45 13:00	0	0	0	0	0	0	0
13:00 13:15	0	0	0	0	0	0	0
13:15 13:30	0	0	0	0	0	0	0
15:00 15:15	0	0	0	1	0	1	1
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	1	1	1
16:45 17:00	1	0	1	0	1	1	2
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	1	0	1	3	5	8	9



Transportation Services - Traffic Services

Turning Movement Count - Study Results

FALLOWFIELD RD @ O'KEEFE CRT

Survey Date: Wednesday, June 07, 2023

WO No: 40986

Start Time: 07:00

Device: Miovision

Full Study Heavy Vehicles

O'KEEFE CRT

FALLOWFIELD RD

Time Period	Northbound			Southbound			Eastbound			Westbound			Grand Total							
	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	W TOT	STR TOT						
07:00 07:15	0	1	0	1	1	0	0	2	3	0	9	0	16	0	7	0	17	33	18	
07:15 07:30	0	0	0	2	1	0	0	1	3	0	8	1	11	1	2	0	12	23	13	
07:30 07:45	0	0	0	0	0	0	0	2	2	1	10	0	15	0	4	1	15	30	16	
07:45 08:00	0	0	0	0	0	0	0	1	1	1	3	0	9	0	5	0	8	17	9	
08:00 08:15	0	0	0	0	2	0	1	2	4	1	4	0	7	1	2	0	7	14	9	
08:15 08:30	0	0	1	3	2	1	0	3	6	0	7	1	15	0	7	0	17	32	19	
08:30 08:45	0	1	0	1	0	0	0	2	3	0	9	0	17	0	8	1	18	35	19	
08:45 09:00	0	0	1	3	0	2	0	2	5	0	6	0	7	0	1	0	8	15	10	
09:00 09:15	0	0	0	0	0	0	0	0	0	0	7	0	31	0	24	0	31	62	31	
09:15 09:30	0	0	0	0	0	0	0	1	1	1	3	0	13	0	9	0	12	25	13	
09:30 09:45	0	0	0	0	0	0	0	0	0	0	6	0	16	0	10	0	16	32	16	
09:45 10:00	0	0	0	0	1	0	0	2	2	0	4	0	8	0	4	1	10	18	10	
10:00 11:45	0	0	0	0	0	0	1	1	1	7	0	17	0	9	0	16	33	17		
11:45 12:00	0	0	0	0	0	0	0	1	1	1	7	0	17	0	9	0	11	22	11	
12:00 12:15	0	0	0	0	0	0	0	0	0	0	6	0	11	0	5	0	11	22	11	
12:15 12:30	0	0	0	0	0	0	0	1	1	1	3	0	9	0	5	0	8	17	9	
12:30 12:45	0	0	0	0	1	0	0	1	1	0	8	0	17	0	9	0	18	35	18	
12:45 13:00	0	0	0	0	0	0	0	0	0	0	7	0	12	0	5	0	12	24	12	
13:00 13:15	0	0	0	0	0	0	0	1	1	1	2	0	12	0	9	0	11	23	12	
13:15 13:30	0	0	0	0	0	0	0	0	0	0	6	0	11	0	5	0	11	22	11	
15:00 15:15	0	1	0	2	0	0	0	1	3	0	5	0	12	1	7	0	13	25	14	
15:15 15:30	0	0	1	1	1	0	0	2	3	1	6	0	13	0	6	0	14	27	15	
15:30 15:45	0	1	0	0	1	0	0	0	1	2	0	14	0	17	0	3	0	17	34	18
15:45 16:00	0	0	1	3	0	0	1	1	4	0	7	1	17	1	8	0	17	34	19	
16:00 16:15	1	0	0	1	0	0	0	0	1	0	5	0	17	0	11	0	16	33	17	
16:15 16:30	3	0	1	4	0	0	1	2	6	1	4	0	22	0	13	0	18	40	23	
16:30 16:45	0	0	0	0	0	0	0	1	2	1	2	0	8	0	4	0	6	14	8	
16:45 17:00	1	0	0	1	0	0	0	0	1	0	3	0	9	0	5	0	8	17	9	
17:00 17:15	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	0	5	10	5	
17:15 17:30	0	0	2	0	0	1	1	3	0	3	0	4	0	0	0	0	5	9	6	
17:30 17:45	0	0	0	0	0	0	0	0	0	1	0	4	0	3	0	4	8	4	4	
17:45 18:00	1	0	0	1	0	0	0	0	1	0	1	0	4	0	2	0	3	7	4	
Total	6	4	7	28	7	4	4	32	60	10	170	3	397	4	204	3	395	792	426	



Transportation Services - Traffic Services

Turning Movement Count - Study Results

FALLOWFIELD RD @ O'KEEFE CRT

Survey Date: Wednesday, June 07, 2023

WO No: 40986

Start Time: 07:00 **Device:** Miovision

Full Study 15 Minute U-Turn Total

O'KEEFE CRT FALLOWFIELD RD

Time Period	Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00 - 07:15	0	0	0	0	0
07:15 - 07:30	0	0	0	0	0
07:30 - 07:45	0	0	0	0	0
07:45 - 08:00	0	0	0	0	0
08:00 - 08:15	0	0	0	0	0
08:15 - 08:30	0	0	0	0	0
08:30 - 08:45	0	0	0	0	0
08:45 - 09:00	0	0	0	0	0
09:00 - 09:15	1	0	0	0	1
09:15 - 09:30	0	0	0	0	0
09:30 - 09:45	0	0	0	0	0
09:45 - 10:00	0	0	0	0	0
11:30 - 11:45	0	0	0	1	1
11:45 - 12:00	0	0	0	0	0
12:00 - 12:15	0	0	0	0	0
12:15 - 12:30	0	0	0	0	0
12:30 - 12:45	0	0	0	0	0
12:45 - 13:00	0	0	0	0	0
13:00 - 13:15	0	0	0	0	0
13:15 - 13:30	0	0	0	0	0
15:00 - 15:15	0	0	0	1	1
15:15 - 15:30	0	0	0	0	0
15:30 - 15:45	0	0	1	0	1
15:45 - 16:00	0	0	0	0	0
16:00 - 16:15	0	0	0	0	0
16:15 - 16:30	0	0	0	0	0
16:30 - 16:45	0	0	0	0	0
16:45 - 17:00	0	0	0	0	0
17:00 - 17:15	0	0	0	0	0
17:15 - 17:30	0	0	0	0	0
17:30 - 17:45	0	0	0	0	0
17:45 - 18:00	0	0	0	0	0
Total	1	0	1	2	4



Morning Peak Diagram

Specified Period

From: 7:00:00
To: 10:00:00

One Hour Peak
From: 7:45:00
To: 8:45:00

Municipality: Ottawa

Site #: 2317800001

Intersection: Strandherd Dr & Citigate Dr

TFR File #: 1

Count date: 19-Jul-23

Weather conditions:

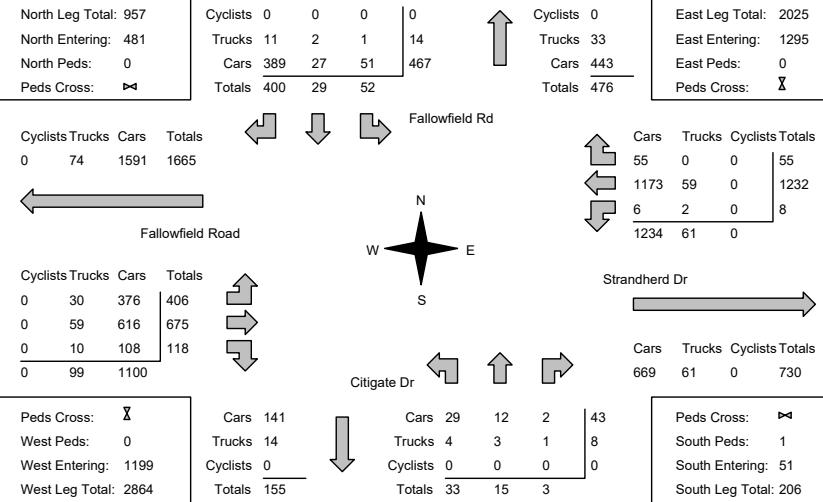
Person counted:

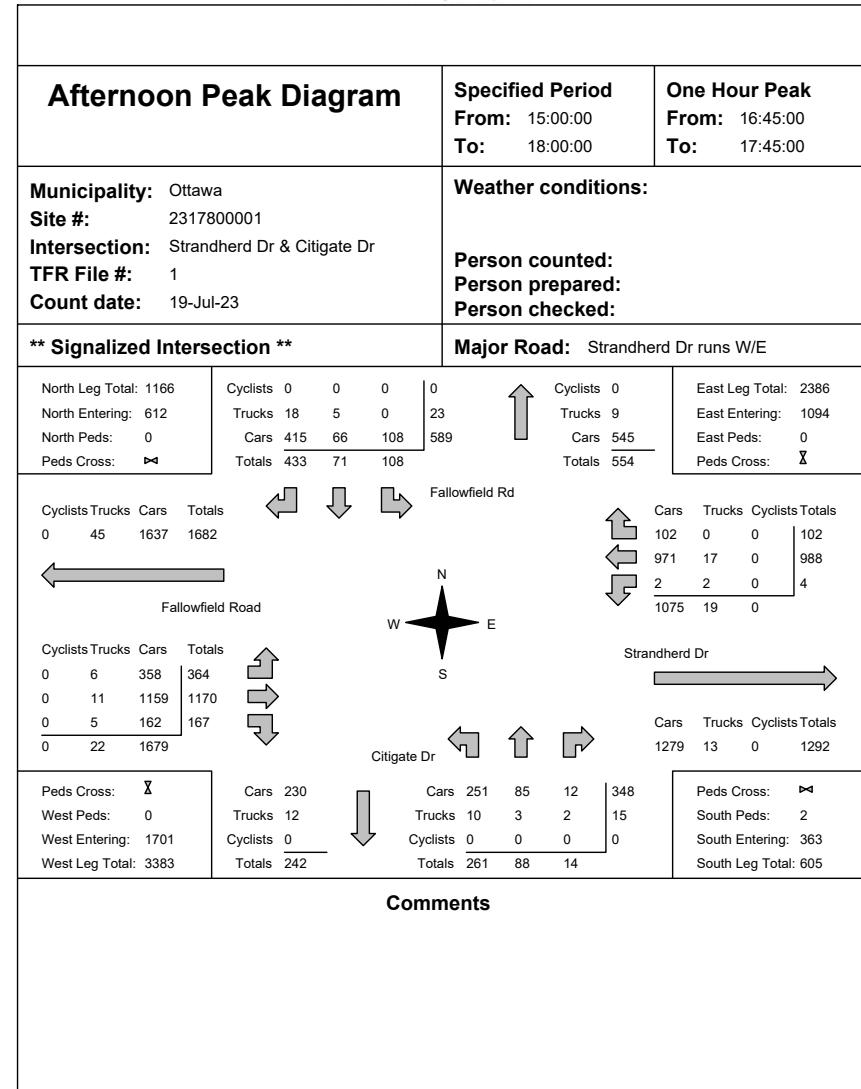
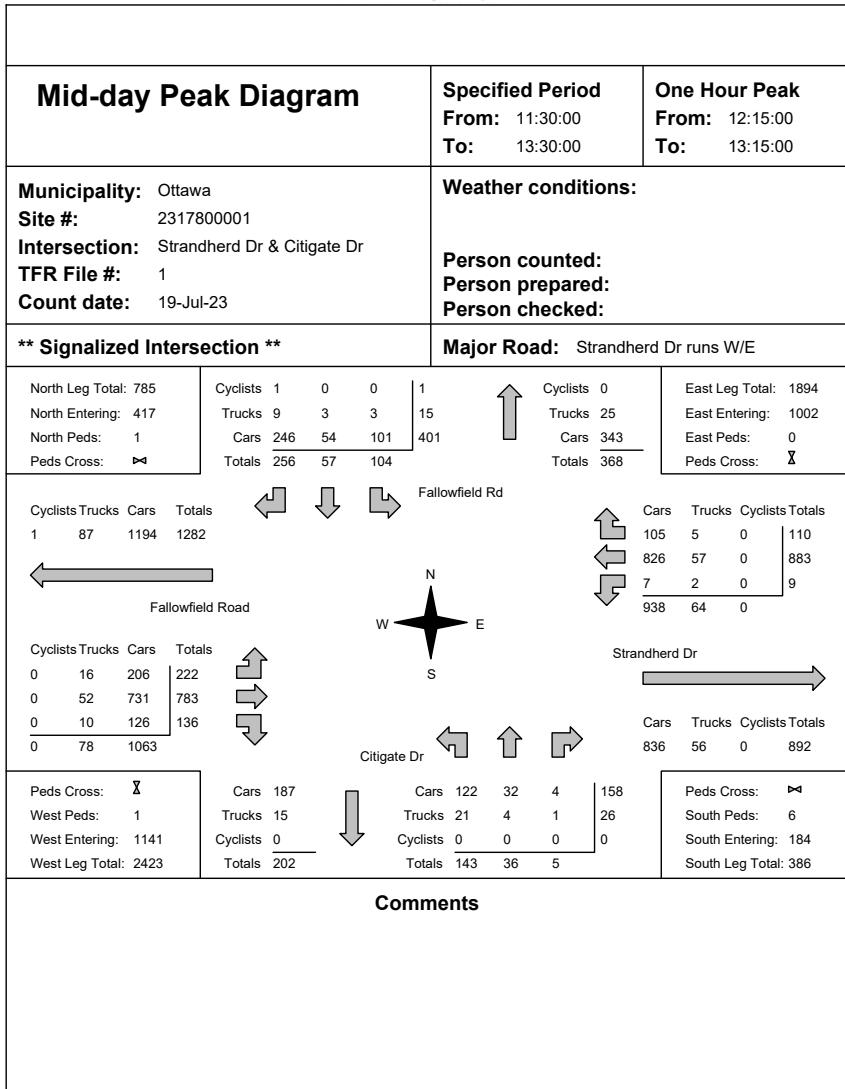
Person prepared:

Person checked:

** Signalized Intersection **

Major Road: Strandherd Dr runs W/E







Total Count Diagram

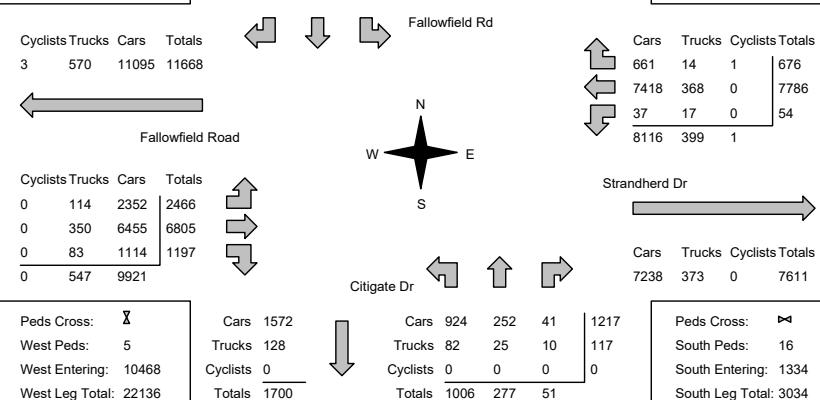
Municipality: Ottawa
Site #: 2317800001
Intersection: Strandherd Dr & Citigate Dr
TFR File #: 1
Count date: 19-Jul-23

Weather conditions:
Person counted:
Person prepared:
Person checked:

** Signalized Intersection **

Major Road: Strandherd Dr runs W/E

North Leg Total: 7499	Cyclists	3	0	0	3	↑	Cyclists	1	East Leg Total: 16127
North Entering: 4080	Trucks	120	28	13	161		Trucks	153	East Entering: 8516
North Peds: 8	Cars	2753	421	742	3916		Cars	3265	East Peds: 4
Peds Cross: ►	Totals	2876	449	755			Totals	3419	Peds Cross: ▲



Comments



Traffic Count Summary

Intersection: Strandherd Dr & Citigate Dr Count Date: 19-Jul-23 Municipality: Ottawa

North Approach Totals					North/South Total Approaches	South Approach Totals						
Hour Ending	Includes Cars, Trucks, & Cyclists					Hour Ending	Includes Cars, Trucks, & Cyclists					
	Left	Thru	Right	Grand Total	Total Peds		Left	Thru	Right	Grand Total		
7:00:00	0	0	0	0	0	7:00:00	0	0	0	0	0	
8:00:00	41	91	302	434	1	530	8:00:00	67	25	4	96	3
9:00:00	55	25	394	474	2	528	9:00:00	40	11	3	54	0
10:00:00	91	52	350	493	0	581	10:00:00	69	14	5	88	1
12:00:00	55	23	156	234	0	303	12:00:00	49	17	3	69	1
13:00:00	105	66	253	424	1	581	13:00:00	122	30	5	157	7
15:00:00	61	14	128	203	0	285	15:00:00	65	16	1	82	0
16:00:00	112	39	395	546	3	724	16:00:00	137	31	10	178	1
17:00:00	124	60	489	673	1	934	17:00:00	206	43	12	261	1
18:00:00	111	79	409	599	0	948	18:00:00	251	90	8	349	2
Totals:	755	449	2876	4080	8	5414	S Totals:	1006	277	51	1334	16
East Approach Totals					East/West Total Approaches	West Approach Totals						
Hour Ending	Includes Cars, Trucks, & Cyclists					Hour Ending	Includes Cars, Trucks, & Cyclists					
	Left	Thru	Right	Grand Total	Total Peds		Left	Thru	Right	Grand Total		
7:00:00	0	0	0	0	0	7:00:00	0	0	0	0	0	
8:00:00	17	1055	38	1110	1	2259	8:00:00	336	591	222	1149	2
9:00:00	5	1232	65	1302	2	2455	9:00:00	376	654	123	1153	0
10:00:00	6	886	69	961	0	2045	10:00:00	252	728	104	1084	1
12:00:00	3	435	68	506	1	1083	12:00:00	127	374	76	577	0
13:00:00	8	824	103	935	0	2104	13:00:00	231	787	151	1169	1
15:00:00	3	445	45	493	0	1060	15:00:00	113	384	70	567	0
16:00:00	5	919	95	1019	0	2447	16:00:00	311	978	139	1428	1
17:00:00	3	1017	101	1121	0	2761	17:00:00	362	1128	150	1640	0
18:00:00	4	973	92	1069	0	2770	18:00:00	358	1181	162	1701	0
Totals:	54	7786	676	8516	4	18984	W Totals:	2466	6805	1197	10468	5

Calculated Values for Traffic Crossing Major Street

Hours Ending: 8:00 10:00 12:00 13:00 15:00 16:00 17:00 18:00
Crossing Values: 202 213 128 294 142 289 390 452



Count Date: 19-Jul-23 Site #: 231780001

Count Date: 19-Jul-23 Site #: 2317800001																											
Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Cyclists - North Approach						Pedestrians								
	Left			Thru			Right			Left			Thru			Right			Left			Thru			Right		
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:15:00	10	10	29	29	44	44	2	2	1	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:30:00	16	6	67	38	102	58	2	0	1	0	3	1	0	0	0	0	0	0	0	0	0	0	0	1	1		
7:45:00	23	7	78	11	202	100	3	1	2	1	4	1	0	0	0	0	0	0	0	0	0	0	0	1	0		
8:00:00	38	15	86	11	295	63	3	0	2	0	7	3	0	0	0	0	0	0	0	0	0	0	0	1	0		
8:15:00	44	6	92	9	355	90	4	1	3	1	10	3	0	0	0	0	0	0	0	0	0	0	0	1	0		
8:30:00	64	14	97	5	466	81	4	0	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0		
8:45:00	74	10	105	8	591	125	4	0	4	1	15	3	0	0	0	0	0	0	0	0	0	0	0	1	0		
9:00:00	91	17	112	7	677	86	5	1	4	0	19	4	0	0	0	0	0	0	0	0	0	0	0	3	2		
9:15:00	35	12	124	12	757	80	6	1	6	2	21	2	0	0	0	0	0	0	0	1	1	1	3	0			
9:30:00	141	15	135	11	845	88	6	0	8	2	23	2	0	0	0	0	0	0	0	2	1	3	0				
9:45:00	162	20	155	16	907	82	6	0	1	26	3	0	0	0	0	0	0	0	2	0	3	0					
10:00:00	179	17	158	13	1009	82	8	2	10	1	35	9	0	0	0	0	0	0	2	0	3	0					
10:15:00	179	0	158	0	1009	0	8	0	10	0	35	0	0	0	0	0	0	0	2	0	3	0					
11:30:00	179	0	158	0	1009	0	8	0	10	0	35	0	0	0	0	0	0	0	2	0	3	0					
11:45:00	201	22	167	9	1084	75	8	0	13	3	42	7	0	0	0	0	0	0	2	0	3	0					
12:00:00	233	32	178	11	1151	67	9	1	13	0	49	7	0	0	0	0	0	0	2	0	3	0					
12:15:00	271	38	191	13	1213	63	9	0	15	2	52	3	0	0	0	0	0	0	2	0	3	0					
12:30:00	325	23	222	22	1253	57	9	0	15	5	54	2	0	0	0	0	0	0	3	0	3	0					
12:45:00	314	20	229	16	1338	61	10	1	16	1	56	2	0	0	0	0	0	0	3	0	4	1					
13:00:00	337	23	240	11	1393	55	10	0	17	1	59	3	0	0	0	0	0	0	3	0	4	0					
13:15:00	372	35	245	5	1460	67	12	2	18	1	61	2	0	0	0	0	0	0	3	0	4	0					
13:30:00	394	24	253	8	1510	50	12	0	18	0	70	9	0	0	0	0	0	0	3	0	4	0					
13:45:00	395	0	253	0	1510	0	12	0	18	0	70	0	0	0	0	0	0	0	3	0	4	0					
13:59:00	396	0	253	0	1510	0	0	0	18	0	70	0	0	0	0	0	0	0	3	0	4	0					
14:15:00	422	26	263	10	1617	107	12	0	19	1	79	9	0	0	0	0	0	0	3	0	5	1					
14:30:00	448	26	275	12	1698	81	12	0	19	0	84	5	0	0	0	0	0	0	3	0	6	1					
14:45:00	475	27	281	6	1788	90	13	1	21	2	90	6	0	0	0	0	0	0	3	0	6	0					
16:00:00	507	32	289	8	1883	95	13	0	21	0	92	2	0	0	0	0	0	0	3	0	7	1					
16:15:00	492	30	286	19	2003	120	13	0	22	1	94	2	0	0	0	0	0	0	3	0	7	0					
16:30:00	574	29	322	11	2153	135	13	0	22	0	98	4	0	0	0	0	0	0	3	0	8	0					
16:45:00	606	29	332	11	2256	121	13	0	23	0	99	1	0	0	0	0	0	0	3	0	8	0					
17:00:00	631	25	345	13	2256	99	13	0	25	2	109	10	0	0	0	0	0	0	3	0	8	0					
17:15:00	656	27	360	15	2466	111	13	0	27	2	112	3	0	0	0	0	0	0	3	0	8	0					
17:30:00	682	22	377	17	2572	106	13	0	27	0	115	3	0	0	0	0	0	0	3	0	8	0					
17:45:00	714	34	398	21	2671	99	13	0	28	1	117	2	0	0	0	0	0	0	3	0	8	0					
18:00:00	742	28	421	23	2753	82	13	0	28	0	120	3	0	0	0	0	0	0	3	0	8	0					
18:15:00	742	0	421	0	2753	0	13	0	28	0	120	0	0	0	0	0	0	0	3	0	8	0					
18:30:00	742	0	421	0	2753	0	13	0	28	0	120	0	0	0	0	0	0	0	3	0	8	0					



Count Date: 19-Jul-23 Site #: 2317800001

Count Date: 19-Jul-23 Site #: 231780001																				
Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Cyclists - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	7	7	199	199	3	3	0	0	7	7	0	0	0	0	0	0	0	0	0	0
7:30:00	9	2	457	258	12	9	2	2	15	8	1	1	0	0	0	0	0	0	1	1
7:45:00	11	2	727	270	25	13	2	0	32	17	2	1	0	0	0	0	0	0	1	0
8:00:00	14	3	1010	283	36	11	3	1	45	13	2	0	0	0	0	0	0	0	1	0
8:15:00	16	2	1287	302	54	18	3	0	59	14	2	0	0	0	0	0	0	0	1	0
8:30:00	16	0	1591	302	67	13	4	1	74	15	2	0	0	0	0	0	0	0	1	0
8:45:00	17	1	1900	309	80	13	4	0	91	17	2	0	0	0	0	0	0	0	1	0
9:00:00	17	0	2186	288	100	20	5	1	101	10	3	1	0	0	0	0	0	0	3	2
9:15:00	20	3	2378	192	117	17	5	0	117	16	4	1	0	0	0	0	0	0	3	0
9:30:00	21	1	2615	237	134	17	6	1	128	11	4	0	0	0	0	0	0	0	3	0
9:45:00	21	0	2881	185	156	16	6	0	144	16	4	0	0	0	0	0	0	0	3	0
10:00:00	21	0	3016	205	167	17	7	1	157	13	5	1	0	0	0	0	0	0	3	0
10:15:00	21	0	3016	205	167	0	7	0	157	0	5	0	0	0	0	0	0	0	3	0
11:30:00	21	0	3016	205	167	0	7	0	157	0	5	0	0	0	0	0	0	0	3	0
11:45:00	23	2	3222	206	203	36	7	0	175	18	6	1	0	0	0	0	0	0	3	0
12:00:00	23	0	3417	195	233	30	8	1	191	16	7	1	0	0	0	0	0	0	4	1
12:15:00	23	0	3501	170	254	21	8	0	201	10	7	0	0	0	0	0	0	0	4	0
12:30:00	23	2	3778	191	277	30	9	1	209	8	9	2	0	0	0	0	0	0	0	0
12:45:00	27	1	4000	222	311	34	9	0	223	14	11	2	0	0	0	0	0	0	4	0
13:00:00	29	2	4192	192	332	21	10	1	240	17	11	0	0	0	0	0	0	0	4	0
13:15:00	31	2	4413	211	359	27	10	0	258	18	12	1	0	0	0	0	0	0	4	0
13:30:00	31	0	4605	192	374	15	11	1	272	14	13	1	0	0	0	0	0	1	4	0
13:45:00	31	0	4605	0	374	0	11	0	272	0	13	0	0	0	0	0	0	1	4	0
14:00:00	31	0	4605	0	374	0	11	0	272	0	13	0	0	0	0	0	0	1	4	0
15:15:00	32	1	4800	195	397	23	11	0	283	11	13	0	0	0	0	0	0	1	4	0
15:30:00	34	2	5033	223	418	21	12	1	291	8	13	0	0	0	0	0	0	1	4	0
15:45:00	34	0	5255	222	444	26	12	0	302	11	13	0	0	0	0	0	0	1	4	0
16:00:00	34	0	5490	235	468	24	13	1	306	4	14	1	0	0	0	0	0	1	0	4
16:15:00	35	0	5713	223	487	19	13	0	322	16	14	0	0	0	0	0	0	1	0	4
16:30:00	34	0	5869	222	514	27	14	1	335	11	14	0	0	0	0	0	0	1	0	4
16:45:00	34	0	6209	246	540	26	14	0	346	13	14	0	0	0	0	0	0	1	0	4
17:00:00	35	1	6464	255	569	29	15	1	349	3	14	0	0	0	0	0	0	1	0	4
17:15:00	35	0	6703	235	589	20	15	0	355	6	14	0	0	0	0	0	0	1	0	4
17:30:00	36	1	6926	223	620	31	16	1	362	7	14	0	0	0	0	0	0	1	0	4
17:45:00	36	0	7180	254	642	22	16	0	363	1	14	0	0	0	0	0	0	1	0	4
18:00:00	37	1	7418	238	661	19	17	1	368	5	14	0	0	0	0	0	0	1	0	4
18:15:00	37	0	7418	0	681	0	17	0	368	0	14	0	0	0	0	0	0	1	0	4
18:30:00	37	0	7418	0	681	0	17	0	368	0	14	0	0	0	0	0	0	1	0	4



Count Date: 19-Jul-23 Site #: 2317800001



Count Date: 19-Jul-23 Site #: 231780000

Appendix C

Synchro Intersection Worksheets – Existing Conditions

Intersection							
Int Delay, s/veh	0.6						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	Y	Y	Y	Y	Y	Y	
Traffic Vol, veh/h	14	6	9	332	208	12	
Future Vol, veh/h	14	6	9	332	208	12	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	0	-	-	-	-	-	
Veh in Median Storage, #	0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	90	90	90	90	90	90	
Heavy Vehicles, %	14	2	11	2	2	17	
Mvmt Flow	16	7	10	369	231	13	
Major/Minor		Minor2	Major1	Major2			
Conflicting Flow All	627	238	244	0	-	0	
Stage 1	238	-	-	-	-	-	
Stage 2	389	-	-	-	-	-	
Critical Hdwy	6.54	6.22	4.21	-	-	-	
Critical Hdwy Stg 1	5.54	-	-	-	-	-	
Critical Hdwy Stg 2	5.54	-	-	-	-	-	
Follow-up Hdwy	3.626	3.318	2.299	-	-	-	
Pot Cap-1 Maneuver	429	801	1271	-	-	-	
Stage 1	774	-	-	-	-	-	
Stage 2	659	-	-	-	-	-	
Platoon blocked, %	-	-	-	-	-	-	
Mov Cap-1 Maneuver	425	801	1271	-	-	-	
Mov Cap-2 Maneuver	425	-	-	-	-	-	
Stage 1	766	-	-	-	-	-	
Stage 2	659	-	-	-	-	-	
Approach		EB	NB	SB			
HCM Control Delay, s	12.6	-	0.2	-	0	-	
HCM LOS	B	-	-	-	-	-	
Minor Lane/Major Mvmt		NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1271	-	495	-	-	-	
HCM Lane V/C Ratio	0.008	-	0.045	-	-	-	
HCM Control Delay (s)	7.9	0	12.6	-	-	-	
HCM Lane LOS	A	A	B	-	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	-	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Traffic Volume (vph)	406	675	118	8	1232	55	33	15	3	52	29	400
Future Volume (vph)	406	675	118	8	1232	55	33	15	3	52	29	400
Satd. Flow (prot)	3066	3103	1401	1353	3221	1483	2929	1426	0	1658	1664	1469
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3066	3103	1401	1353	3221	1483	2927	1426	0	1658	1664	1450
Satd. Flow (RTOR)			131				225			3		405
Lane Group Flow (vph)	451	750	131	9	1369	61	37	20	0	58	32	444
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	
Protected Phases	13	10 2	7	9	6		7	4	3	8		8
Permitted Phases						6						
Detector Phase	13	10 2	7	9	6	6	7	4	3	8		8
Switch Phase												
Minimum Initial (s)	5.0		5.0	10.0	10.0	5.0	10.0		5.0	10.0	10.0	
Minimum Split (s)	12.1		11.5	12.1	29.9	29.9	11.5	48.0	11.5	48.0	48.0	
Total Split (s)	28.0		13.0	13.0	31.0	31.0	13.0	48.0	13.0	48.0	48.0	
Total Split (%)	23.3%		10.8%	10.8%	25.8%	25.8%	10.8%	40.0%	10.8%	40.0%	40.0%	
Yellow Time (s)	4.6		3.7	4.6	4.6	3.7	3.7		3.7	3.7	3.7	
All-Red Time (s)	2.5		2.8	2.5	2.3	2.3	2.8		2.8	3.3	3.3	
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)	7.1		6.5	7.1	6.9	6.9	6.5	7.0	6.5	7.0	7.0	
Lead/Lag			Lag	Lead		Lag	Lead		Lag	Lead	Lead	
Lead-Lag Optimize?			Yes	Yes		Yes	Yes		Yes	Yes	Yes	
Recall Mode	None		None	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	23.1	79.7	87.4	6.4	47.7	47.7	7.0	12.4	18.7	14.8	14.8	
Actuated g/C Ratio	0.19	0.66	0.73	0.05	0.40	0.40	0.06	0.10	0.16	0.12	0.12	
v/c Ratio	0.77	0.36	0.12	0.12	1.07	0.08	0.22	0.13	0.22	0.16	0.83	
Control Delay	54.7	11.9	1.6	57.2	81.7	0.2	56.5	47.9	44.5	45.4	20.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.7	11.9	1.6	57.2	81.7	0.2	56.5	47.9	44.5	45.4	20.9	
LOS	D	B	A	E	F	A	E	D	D	D	C	
Approach Delay			25.4			78.1			53.5		24.9	
Approach LOS			C			E			D		C	
Queue Length 50th (m)	52.2	29.0	0.0	2.1	163.3	0.0	4.3	3.8	11.4	7.2	8.8	
Queue Length 95th (m)	66.7	84.5	6.2	7.3	#295.0	0.0	9.7	11.6	22.8	14.4	41.8	
Internal Link Dist (m)		441.7				233.3			132.8		356.4	
Turn Bay Length (m)	127.0		96.5	95.0		90.0	90.0		140.0		125.0	
Base Capacity (vph)	605	2055	1031	74	1279	724	176	489	259	568	762	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.36	0.13	0.12	1.07	0.08	0.21	0.04	0.22	0.06	0.58	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 101 (84%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
2: Citigate & Fallowfield & Strandherd

Existing AM Peak Hour
4497 O'Keefe Court

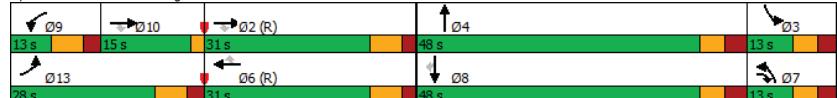
Lane Group	Ø2	Ø10
Lane Configurations		
Traffic Volume (vph)		
Future Volume (vph)		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Satd. Flow (RTOR)		
Lane Group Flow (vph)		
Turn Type		
Protected Phases	2	10
Permitted Phases		
Detector Phase		
Switch Phase		
Minimum Initial (s)	10.0	10.0
Minimum Split (s)	29.9	12.0
Total Split (s)	31.0	15.0
Total Split (%)	26%	13%
Yellow Time (s)	4.6	2.0
All-Red Time (s)	2.3	0.0
Lost Time Adjust (s)		
Total Lost Time (s)		
Lead/Lag	Lag	
Lead-Lag Optimize?	Yes	
Recall Mode	C-Max	None
Act Efft Green (s)		
Actuated g/C Ratio		
v/c Ratio		
Control Delay		
Queue Delay		
Total Delay		
LOS		
Approach Delay		
Approach LOS		
Queue Length 50th (m)		
Queue Length 95th (m)		
Internal Link Dist (m)		
Turn Bay Length (m)		
Base Capacity (vph)		
Starvation Cap Reductn		
Spillback Cap Reductn		
Storage Cap Reductn		
Reduced v/c Ratio		
Intersection Summary		

Lanes, Volumes, Timings
2: Citigate & Fallowfield & Strandherd

Existing AM Peak Hour
4497 O'Keefe Court

Maximum v/c Ratio: 1.07
Intersection Signal Delay: 48.3
Intersection Capacity Utilization 83.6%
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Citigate & Fallowfield & Strandherd



HCM 2010 TWSC
3: Cobble Hill/O'Keefe & Fallowfield

Existing AM Peak Hour
4497 O'Keefe Court

Intersection		Existing AM Peak Hour											
Int Delay, s/veh	2.6	4497 O'Keefe Court											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↑	↑	↑	↑	↑	↑	Φ	↑	↑	↑	↑	↑	
Traffic Vol, veh/h	18	543	11	15	439	7	30	2	52	6	3	16	
Future Vol, veh/h	18	543	11	15	439	7	30	2	52	6	3	16	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	1	1	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	-	-	None	-	-	None	-	-	42.5	-	-	None	
Storage Length	147.5	-	0	-	30.5	-	-	-	-	-	-	-	
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, %	11	4	9	7	5	14	2	50	2	33	67	2	
Mvmt Flow	20	603	12	17	488	8	33	2	58	7	3	18	
Major/Minor		Major1	Major2		Minor1	Minor2							
Conflicting Flow All	496	0	0	615	0	0	1180	1173	604	1202	1177	488	
Stage 1	-	-	-	-	-	-	643	643	-	522	522	-	
Stage 2	-	-	-	-	-	-	537	530	-	680	655	-	
Critical Hdwy	4.21	-	-	4.17	-	-	7.12	7	6.22	7.43	7.17	6.22	
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	6	-	6.43	6.17	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	6	-	6.43	6.17	-	
Follow-up Hdwy	2.299	-	-	2.263	-	-	3.518	4.45	3.318	3.797	4.603	3.318	
Pot Cap-1 Maneuver	1023	-	-	941	-	-	167	157	498	140	145	580	
Stage 1	-	-	-	-	-	-	462	402	-	485	438	-	
Stage 2	-	-	-	-	-	-	528	456	-	394	376	-	
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	
Mov Cap-1 Maneuver	1023	-	-	941	-	-	154	151	498	119	139	580	
Mov Cap-2 Maneuver	-	-	-	-	-	-	154	151	-	119	139	-	
Stage 1	-	-	-	-	-	-	453	394	-	475	430	-	
Stage 2	-	-	-	-	-	-	499	448	-	339	368	-	
Approach		EB	WB		NB	SB							
HCM Control Delay, s	0.3	-	0.3	-	25.3	-	20.2						
HCM LOS	-	-	-	D	-	C	-						
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2				
Capacity (veh/h)	269	1023	-	-	941	-	-	119	386				
HCM Lane V/C Ratio	0.347	0.02	-	-	0.018	-	-	0.056	0.055				
HCM Control Delay (s)	25.3	8.6	-	-	8.9	-	-	37	14.9				
HCM Lane LOS	D	A	-	-	A	-	-	E	B				
HCM 95th %tile Q(veh)	1.5	0.1	-	-	0.1	-	-	0.2	0.2				

Lanes, Volumes, Timings
4: Cedarview & Fallowfield

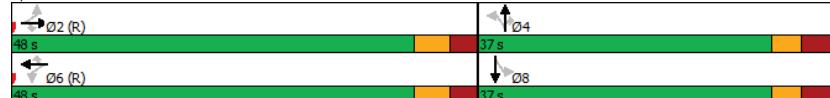
Existing AM Peak Hour
4497 O'Keefe Court

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	44	692	10	31	400	174	49	248	192	98	62	12
Future Volume (vph)	44	692	10	31	400	174	49	248	192	98	62	12
Satd. Flow (prot)	1658	1712	1261	1537	1728	1483	1658	1745	1469	1642	1651	0
Flt Permitted	0.467	-	-	-	-	-	0.248	-	-	0.704	-	0.431
Satd. Flow (perm)	815	1712	1234	401	1728	1483	1229	1745	1469	745	1651	0
Satd. Flow (RTOR)	-	-	-	-	-	-	49	-	-	134	-	12
Lane Group Flow (vph)	49	769	11	34	444	193	54	276	213	109	82	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	-	-	-	-	-	-	2	-	-	6	-	8
Permitted Phases	2	-	-	-	-	-	2	-	-	6	-	8
Detector Phase	2	2	2	6	6	6	6	4	4	4	8	8
Switch Phase	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	48.0	48.0	48.0	48.0	48.0	48.0	37.0	37.0	37.0	37.0	37.0	37.0
Total Split (s)	48.0	48.0	48.0	48.0	48.0	48.0	37.0	37.0	37.0	37.0	37.0	37.0
Total Split (%)	56.5%	56.5%	56.5%	56.5%	56.5%	56.5%	43.5%	43.5%	43.5%	43.5%	43.5%	43.5%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.8	3.8	3.8	3.8	3.8	3.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8	6.8	6.8	6.8	6.8
Lead/Lag	-	-	-	-	-	-	-	-	-	-	-	-
Lead-Lag Optimize?	-	-	-	-	-	-	-	-	-	-	-	-
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	52.4	52.4	52.4	52.4	52.4	52.4	19.1	19.1	19.1	19.1	19.1	19.1
Actuated g/C Ratio	0.62	0.62	0.62	0.62	0.62	0.62	0.22	0.22	0.22	0.22	0.22	0.22
v/c Ratio	0.10	0.73	0.01	0.14	0.42	0.20	0.20	0.71	0.49	0.65	0.22	
Control Delay	9.0	18.4	0.0	10.6	11.0	2.0	26.2	39.7	14.4	47.2	22.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.0	18.4	0.0	10.6	11.0	2.0	26.2	39.7	14.4	47.2	22.6	
LOS	A	B	A	B	B	A	C	D	B	D	C	
Approach Delay	-	-	-	-	-	-	17.6	-	8.4	-	28.4	36.7
Approach LOS	-	-	-	-	-	-	B	-	-	C	-	D
Queue Length 50th (m)	2.9	77.7	0.0	2.1	33.2	0.0	7.2	41.7	10.6	16.2	9.3	
Queue Length 95th (m)	9.3	#172.1	0.0	7.8	65.9	8.9	14.8	59.6	26.4	30.3	18.3	
Internal Link Dist (m)	-	-	-	-	-	-	561.2	-	452.7	-	444.3	482.1
Turn Bay Length (m)	60.0	-	-	55.0	60.0	-	55.0	180.0	-	80.0	-	45.5
Base Capacity (vph)	502	1055	779	247	1065	988	436	619	608	264	594	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.73	0.01	0.14	0.42	0.20	0.12	0.45	0.35	0.41	0.14	
Intersection Summary	-	-	-	-	-	-	-	-	-	-	-	-
Cycle Length: 85	-	-	-	-	-	-	-	-	-	-	-	-
Actuated Cycle Length: 85	-	-	-	-	-	-	-	-	-	-	-	-
Offset: 40 (47%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green	-	-	-	-	-	-	-	-	-	-	-	-
Natural Cycle: 85	-	-	-	-	-	-	-	-	-	-	-	-
Control Type: Actuated-Coordinated	-	-	-	-	-	-	-	-	-	-	-	-

Lanes, Volumes, Timings
4: Cedarview & Fallowfield

Maximum v/c Ratio: 0.73
Intersection Signal Delay: 19.1
Intersection LOS: B
Intersection Capacity Utilization 77.6%
ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Cedarview & Fallowfield



Existing AM Peak Hour
4497 O'Keefe Court

HCM 2010 TWSC
1: Cedarview & Onassa

Existing PM Peak Hour
4497 O'Keefe Court

Intersection						
Int Delay, s/veh 0.6						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		Y	Y		Y
Traffic Vol, veh/h	13	15	4	244	496	8
Future Vol, veh/h	13	15	4	244	496	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	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	8	7	2	2	2	2
Mvmt Flow	14	17	4	271	551	9
Major/Minor						
Minor2						
Conflicting Flow All	835	556	560	0	-	0
Stage 1	556	-	-	-	-	-
Stage 2	279	-	-	-	-	-
Critical Hdwy	6.48	6.27	4.12	-	-	-
Critical Hdwy Stg 1	5.48	-	-	-	-	-
Critical Hdwy Stg 2	5.48	-	-	-	-	-
Follow-up Hdwy	3.572	3.363	2.218	-	-	-
Pot Cap-1 Maneuver	330	521	1011	-	-	-
Stage 1	563	-	-	-	-	-
Stage 2	755	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	328	521	1011	-	-	-
Mov Cap-2 Maneuver	328	-	-	-	-	-
Stage 1	560	-	-	-	-	-
Stage 2	755	-	-	-	-	-
Approach						
EB						
HCM Control Delay, s	14.5		0.1		0	
HCM LOS	B					
Minor Lane/Major Mvmt						
NBL NBT EBLn1 SBT SBR						
Capacity (veh/h)	1011	-	409	-	-	-
HCM Lane V/C Ratio	0.004	-	0.076	-	-	-
HCM Control Delay (s)	8.6	0	14.5	-	-	-
HCM Lane LOS	A	A	B	-	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-	-

Lanes, Volumes, Timings
2: Citigate & Fallowfield & Strandherd

Existing PM Peak Hour
4497 O'Keefe Court

Lane Group	EBL	EBT	EBC	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	364	1170	167	4	988	102	261	88	14	108	71	433	
Future Volume (vph)	364	1170	167	4	988	102	261	88	14	108	71	433	
Satd. Flow (prot)	3216	3316	1469	1127	3316	1483	3154	1667	0	1658	1664	1455	
Flt Permitted	0.950						0.950						
Satd. Flow (perm)	3216	3316	1432	1126	3316	1483	3154	1667	0	1658	1664	1455	
Satd. Flow (RTOR)			160			160		7				359	
Lane Group Flow (vph)	404	1300	186	4	1098	113	290	114	0	120	79	481	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA	Perm		
Protected Phases	13	2		9	6		7	4		3	8		
Permitted Phases					2		6				8		
Detector Phase	13	2	2	9	6	6	7	4	3	8	8		
Switch Phase													
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0		
Minimum Split (s)	12.1	29.9	29.9	12.1	29.9	29.9	11.5	48.0	11.5	48.0	48.0		
Total Split (s)	24.0	34.0	34.0	24.0	34.0	34.0	14.0	48.0	14.0	48.0	48.0		
Total Split (%)	20.0%	28.3%	28.3%	20.0%	28.3%	28.3%	11.7%	40.0%	11.7%	40.0%	40.0%		
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	3.7	3.7	3.7	3.7	3.7		
All-Red Time (s)	2.5	2.3	2.3	2.5	2.3	2.3	2.8	3.3	2.8	3.3	3.3		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	7.1	6.9	6.9	7.1	6.9	6.9	6.5	7.0	6.5	7.0	7.0		
Lead/Lag					Lag	Lead	Lag	Lead	Lag	Lead	Lead		
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None		
Act Effct Green (s)	18.7	55.0	55.0	6.1	32.1	32.1	21.2	13.6	28.2	20.6	20.6		
Actuated g/C Ratio	0.16	0.46	0.46	0.05	0.27	0.27	0.18	0.11	0.24	0.17	0.17		
v/c Ratio	0.81	0.86	0.25	0.07	1.24	0.22	0.52	0.58	0.31	0.28	0.88		
Control Delay	62.4	36.9	6.8	56.2	155.3	2.8	50.3	59.0	40.3	42.2	29.8		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	62.4	36.9	6.8	56.2	155.3	2.8	50.3	59.0	40.3	42.2	29.8		
LOS	E	D	A	E	F	A	D	E	D	D	C		
Approach Delay	39.4			140.7			52.8			33.1			
Approach LOS	D			F			D			C			
Queue Length 50th (m)	46.5	127.7	3.0	0.9	~169.8	0.0	32.4	24.4	24.0	16.7	29.9		
Queue Length 95th (m)	#75.9	#246.5	21.4	4.6	#227.6	5.3	#60.3	41.2	39.7	25.7	63.4		
Internal Link Dist (m)	441.7			233.3			132.8			356.4			
Turn Bay Length (m)	127.0		96.5	95.0		90.0	90.0		140.0		125.0		
Base Capacity (vph)	503	1519	743	158	886	513	556	574	389	568	733		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.80	0.86	0.25	0.03	1.24	0.22	0.52	0.20	0.31	0.14	0.66		

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 145

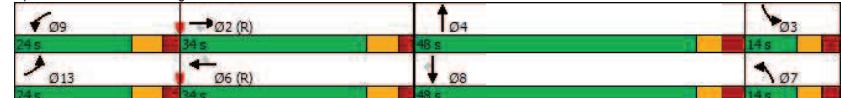
Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
2: Citigate & Fallowfield & Strandherd

Existing PM Peak Hour
4497 O'Keefe Court

Maximum v/c Ratio: 1.24	Intersection Signal Delay: 69.0	Intersection LOS: E
	Intersection Capacity Utilization 82.0%	ICU Level of Service D
	Analysis Period (min) 15	
	~ Volume exceeds capacity, queue is theoretically infinite.	
	Queue shown is maximum after two cycles.	
	# 95th percentile volume exceeds capacity, queue may be longer.	
	Queue shown is maximum after two cycles.	

Splits and Phases: 2: Citigate & Fallowfield & Strandherd



HCM 2010 TWSC
3: Cobble Hill/O'Keefe & Fallowfield

Existing PM Peak Hour
4497 O'Keefe Court

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	Φ	↑	↑	↑	↑	↑
Traffic Vol, veh/h	19	499	66	52	611	17	21	3	44	7	3	16
Future Vol, veh/h	19	499	66	52	611	17	21	3	44	7	3	16
Conflicting Peds, #/hr	0	0	1	1	0	0	0	0	2	2	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	147.5	-	0	-	30.5	-	-	42.5	-	-	-	-
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, %	11	3	2	2	5	2	24	2	2	2	2	13
Mvmt Flow	21	554	73	58	679	19	23	3	49	8	3	18
Major/Minor												
Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	698	0	0	628	0	0	1412	1411	557	1456	1465	679
Stage 1	-	-	-	-	-	-	597	597	-	795	795	-
Stage 2	-	-	-	-	-	-	815	814	-	661	670	-
Critical Hdwy	4.21	-	-	4.12	-	-	7.34	6.52	6.22	7.12	6.52	6.33
Critical Hdwy Stg 1	-	-	-	-	-	-	6.34	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.34	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.299	-	-	2.218	-	-	3.716	4.018	3.318	3.518	4.018	3.417
Pot Cap-1 Maneuver	858	-	-	954	-	-	103	138	530	108	128	433
Stage 1	-	-	-	-	-	-	454	491	-	381	399	-
Stage 2	-	-	-	-	-	-	341	391	-	452	455	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	858	-	-	953	-	-	90	126	529	90	117	433
Mov Cap-2 Maneuver	-	-	-	-	-	-	90	126	-	90	117	-
Stage 1	-	-	-	-	-	-	443	479	-	372	375	-
Stage 2	-	-	-	-	-	-	304	367	-	397	444	-
Approach												
	EB		WB		NB		SB					
HCM Control Delay, s	0.3		0.7		33.5		26.1					
HCM LOS			D		D							
Minor Lane/Major Mvmt												
	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2			
Capacity (veh/h)	200	858	-	-	953	-	-	90	304			
HCM Lane V/C Ratio	0.378	0.025	-	-	0.061	-	-	0.086	0.069			
HCM Control Delay (s)	33.5	9.3	-	-	9	-	-	48.8	17.7			
HCM Lane LOS	D	A	-	-	A	-	-	E	C			
HCM 95th %tile Q(veh)	1.6	0.1	-	-	0.2	-	-	0.3	0.2			

Lanes, Volumes, Timings
4: Cedarview & Fallowfield

Existing PM Peak Hour
4497 O'Keefe Court

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	24	398	30	137	652	77	21	89	63	247	412	46
Future Volume (vph)	24	398	30	137	652	77	21	89	63	247	412	46
Satd. Flow (prot)	1658	1745	1483	1642	1728	1483	1537	1728	1469	1658	1717	0
Flt Permitted	0.200				0.427			0.210		0.693		
Satd. Flow (perm)	349	1745	1483	738	1728	1451	340	1728	1469	1209	1717	0
Satd. Flow (RTOR)				49				81		70		7
Lane Group Flow (vph)	27	442	33	152	724	86	23	99	70	274	509	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2				6			4		8	
Permitted Phases	2	2	2	6	6	6	4	4	4	8	8	
Detector Phase												
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	48.0	48.0	48.0	48.0	48.0	48.0	37.0	37.0	37.0	37.0	37.0	37.0
Total Split (s)	48.0	48.0	48.0	48.0	48.0	48.0	37.0	37.0	37.0	37.0	37.0	37.0
Total Split (%)	56.5%	56.5%	56.5%	56.5%	56.5%	56.5%	43.5%	43.5%	43.5%	43.5%	43.5%	43.5%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.8	3.8	3.8	3.8	3.8	3.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8	6.8	6.8	6.8	6.8
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	43.5	43.5	43.5	43.5	43.5	43.5	28.0	28.0	28.0	28.0	28.0	28.0
Actuated g/C Ratio	0.51	0.51	0.51	0.51	0.51	0.51	0.33	0.33	0.33	0.33	0.33	0.33
v/c Ratio	0.15	0.49	0.04	0.40	0.82	0.11	0.21	0.17	0.13	0.69	0.89	
Control Delay	14.9	16.6	2.4	17.8	28.0	3.7	24.8	20.2	5.7	34.3	46.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.9	16.6	2.4	17.8	28.0	3.7	24.8	20.2	5.7	34.3	46.5	
LOS	B	B	A	B	C	A	C	C	A	C	D	
Approach Delay							24.2			15.5		42.2
Approach LOS							C			B		D
Queue Length 50th (m)	2.3	47.2	0.0	15.3	99.3	0.4	2.6	10.8	0.0	36.5	73.4	
Queue Length 95th (m)	7.6	72.8	2.9	31.3	#168.1	7.3	8.6	21.3	8.0	63.0	#125.9	
Internal Link Dist (m)		561.2				452.7			444.3			482.1
Turn Bay Length (m)	60.0			55.0	60.0		55.0	180.0		80.0	45.5	
Base Capacity (vph)	178	893	783	377	885	782	120	613	567	429	614	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.49	0.04	0.40	0.82	0.11	0.19	0.16	0.12	0.64	0.83	
Intersection Summary												
Cycle Length: 85												
Actuated Cycle Length: 85												
Offset: 40 (47%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 85												
Control Type: Actuated-Coordinated												

Lanes, Volumes, Timings
4: Cedarview & Fallowfield

Existing PM Peak Hour
4497 O'Keefe Court

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 27.5

Intersection LOS: C

Intersection Capacity Utilization 87.2%

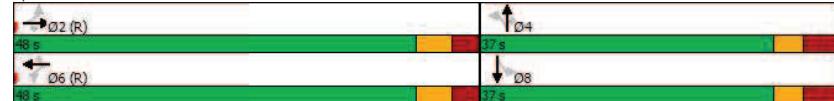
ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 4: Cedarview & Fallowfield



Appendix D

Signal Warrant

O'Keefe @ Fallowfield

Existing

Justification #7

Justification	Description	Minimum Requirement		Minimum Requirement		Compliance		Signal	
		1 Lane Highway		2 or More Lanes		Sectional			
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	625	87%	30%	
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	51	30%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	574	80%	23%	
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	18	23%		

Notes

1. Refer to OTM Book 12, pg 92, Mar 2012
2. Lowest section percentage governs justification
3. Average hourly volumes estimated from peak hour volumes, $AHV = PM/2$ or $(AM + PM) / 4$, including amplification factors
4. T-intersection factor corrected, applies only to 1B

O'Keefe @ Fallowfield
FB2038

Justification #7

Justification	Description	Minimum Requirement		Minimum Requirement		Compliance		Signal	
		1 Lane Highway		2 or More Lanes		Sectional			
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	780	108%	42%	
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	71	42%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	709	98%	49%	
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	37	49%		

Notes

1. Refer to OTM Book 12, pg 92, Mar 2012
2. Lowest section percentage governs justification
3. Average hourly volumes estimated from peak hour volumes, $AHV = PM/2$ or $(AM + PM) / 4$, including amplification factors
4. T-intersection factor corrected, applies only to 1B

O'Keefe @ Fallowfield
FT2038

Justification #7

Justification	Description	Minimum Requirement		Minimum Requirement		Compliance		Signal	
		1 Lane Highway		2 or More Lanes		Sectional			
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%		
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900	947	131%	93%	
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170	158	93%		
2. Delay to Cross Traffic	A. Vehicle volumes, major street (average hour)	480	720	600	900	789	110%	110%	
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	50	75	84	112%		

Notes

1. Refer to OTM Book 12, pg 92, Mar 2012
2. Lowest section percentage governs justification
3. Average hourly volumes estimated from peak hour volumes, $AHV = PM/2$ or $(AM + PM) / 4$, including amplification factors
4. T-intersection factor corrected, applies only to 1B

Appendix E

Collision Data

Accident Date	Accident Year	Accident Time	Location	Environment Condition	Light	Traffic Control	Traffic Control Condition	Classification Of Accident	Initial Impact Type	Road Surface Condition	# Vehicles	# Motorcycles	# Bicycles	# Pedestrians
7/31/2020	2020	3:34	FALLOWFIELD RD @ O'KEEFE CRT (0010311)	01 - Clear	07 - Dark	02 - Stop sign	0	02 - Non-fatal injury	07 - SMV other	01 - Dry	0	0	0	0
12/24/2021	2021	9:39	FALLOWFIELD RD @ O'KEEFE CRT (0010311)	01 - Clear	01 - Daylight	01 - Stop sign	0	03 - P.D. only	07 - SMV other	01 - Dry	0	0	0	0
2/17/2022	2022	22:06	FALLOWFIELD RD @ O'KEEFE CRT (0010311)	03 - Snow	02 - Stop sign	0	0	03 - P.D. only	07 - SMV other	05 - Packed snow	0	0	0	0
8/4/2019	2019	20:48	32000 FT CEDARVIEW RD & CEDARVIEW AVE (001314)	01 - Clear	07 - Dark	10 - No control	0	03 - P.D. only	07 - SMV other	01 - Dry	0	0	0	0
6/19/2019	2019	21:30	FALLOWFIELD RD bwn CEDARVIEW RD & O'KEEFE CRT (00132418)	01 - Clear	07 - Dark	10 - No control	0	03 - P.D. only	07 - SMV other	01 - Dry	0	0	0	0
11/17/2020	2020	3:15	FALLOWFIELD RD bwn CEDARVIEW RD & O'KEEFE CRT (00132418)	01 - Clear	07 - Dark	10 - No control	0	02 - Non-fatal injury	07 - SMV other	01 - Dry	0	0	0	0
1/8/2018	2018	12:55	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	03 - Snow	01 - Daylight	01 - Traffic signal	0	02 - Non-fatal injury	03 - Rear end	04 - Slush	0	0	0	0
2/16/2018	2018	15:35	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
2/8/2018	2018	15:46	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	02 - Angle	01 - Dry	0	0	0	0
2/9/2018	2018	17:45	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	07 - Dark	01 - Traffic signal	0	02 - Non-fatal injury	03 - Rear end	02 - Wet	0	0	0	0
3/9/2018	2018	10:45	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	03 - Snow	01 - Daylight	01 - Traffic signal	0	02 - Non-fatal injury	02 - Angle	02 - Wet	0	0	0	0
4/20/2018	2018	16:11	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	05 - Dusk	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
6/10/2018	2018	21:05	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	02 - Non-fatal injury	02 - Angle	01 - Dry	0	0	0	0
6/24/2018	2018	14:01	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
8/16/2018	2018	12:28	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	04 - SideSwipe	01 - Dry	0	0	0	0
9/10/2018	2018	7:45	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
9/17/2018	2018	14:10	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	04 - SideSwipe	01 - Dry	0	0	0	0
10/24/2018	2018	8:45	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
12/22/2018	2018	8:04	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	04 - SideSwipe	01 - Dry	0	0	0	0
1/1/2019	2019	16:29	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
1/31/2019	2019	16:32	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	05 - Packed snow	0	0	0	0	0
1/29/2019	2019	8:35	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	03 - Loose snow	0	0	0	0
2/25/2019	2019	21:05	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	07 - Dark	01 - Traffic signal	0	03 - P.D. only	05 - Turning movement	01 - Dry	0	0	0	0
3/5/2019	2019	16:30	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	03 - Snow	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	03 - Loose snow	0	0	0	0
5/4/2019	2019	10:30	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
4/24/2019	2019	18:20	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
7/30/2019	2019	8:03	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	04 - SideSwipe	01 - Dry	0	0	0	0
9/14/2019	2019	16:00	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
9/16/2019	2019	8:35	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
11/16/2019	2019	13:41	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
1/31/2020	2020	11:01	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	02 - Non-fatal injury	02 - Angle	01 - Dry	0	0	0	0
3/8/2020	2020	10:29	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
2/20/2020	2020	7:15	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
6/5/2020	2020	15:10	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
7/27/2020	2020	16:27	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
10/1/2020	2020	16:26	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	04 - SideSwipe	01 - Dry	0	0	0	0
1/19/2021	2021	6:46	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	07 - Dark	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
12/28/2020	2020	18:51	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	07 - Dark	01 - Traffic signal	0	03 - P.D. only	04 - SideSwipe	02 - Wet	0	0	0	0
2/27/2021	2021	14:21	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	02 - Non-fatal injury	07 - SMV other	04 - Slush	0	0	0	0
2/18/2021	2021	8:20	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	06 - Ice	0	0	0	0
3/11/2021	2021	8:49	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
7/20/2021	2021	16:30	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	02 - Rain	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	04 - SideSwipe	02 - Wet	0	0	0	0
8/27/2021	2021	16:04	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	04 - SideSwipe	01 - Dry	0	0	0	0
10/1/2021	2021	16:00	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	07 - Dark	01 - Traffic signal	0	03 - P.D. only	07 - SMV other	04 - Slush	0	0	0	0
10/31/2021	2021	4:37	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	07 - Dark	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
11/21/2021	2021	14:45	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
12/15/2021	2021	11:55	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
3/7/2022	2022	19:45	FALLOWFIELD RD @ STRANDHEIRO DR (0005238)	03 - Snow	07 - Dark	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	03 - Loose snow	0	0	0	0
1/22/2018	2018	18:13	CEDARVIEW RD @ FALLOWFIELD RD (0001603)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	05 - Turning movement	03 - Loose snow	0	0	0	0
5/22/2018	2018	8:18	CEDARVIEW RD @ FALLOWFIELD RD (0001603)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	05 - Turning movement	01 - Dry	0	0	0	0
6/14/2018	2018	8:35	CEDARVIEW RD @ FALLOWFIELD RD (0001603)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	02 - Wet	0	0	0	0
7/9/2018	2018	16:21	CEDARVIEW RD @ FALLOWFIELD RD (0001603)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	03 - Loose snow	0	0	0	0
6/22/2018	2018	8:55	CEDARVIEW RD @ FALLOWFIELD RD (0001603)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	05 - Turning movement	01 - Dry	0	0	0	0
8/16/2018	2018	8:29	CEDARVIEW RD @ FALLOWFIELD RD (0001603)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
7/30/2018	2018	13:56	CEDARVIEW RD @ FALLOWFIELD RD (0001603)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	05 - Turning movement	01 - Dry	0	0	0	0
3/13/2019	2019	16:21	CEDARVIEW RD @ FALLOWFIELD RD (0001603)	02 - Rain	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	02 - Wet	0	0	0	0
3/22/2019	2019	7:50	CEDARVIEW RD @ FALLOWFIELD RD (0001603)	02 - Rain	01 - Daylight	01 - Traffic signal	0	02 - Non-fatal injury	05 - Turning movement	02 - Wet	0	0	0	0
4/12/2019	2019	12:00	CEDARVIEW RD @ FALLOWFIELD RD (0001603)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	99 - Other	01 - Dry	0	0	0	0
6/9/2019	2019	11:34	CEDARVIEW RD @ FALLOWFIELD RD (0001603)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
7/1/2019	2019	10:09	CEDARVIEW RD @ FALLOWFIELD RD (0001603)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	02 - Angle	01 - Dry	0	0	0	0
9/26/2019	2019	15:30	CEDARVIEW RD @ FALLOWFIELD RD (0001603)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
1/13/2020	2020	7:20	CEDARVIEW RD @ FALLOWFIELD RD (0001603)	01 - Clear	03 - Dawn	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	03 - Wet	0	0	0	0
2/22/2020	2020	16:01	CEDARVIEW RD @ FALLOWFIELD RD (0001603)	01 - Clear	01 - Daylight	01 - Traffic signal	0	02 - Non-fatal injury	03 - Rear end	01 - Dry	0	0	0	0
6/22/2020	2020	16:55	CEDARVIEW RD @ FALLOWFIELD RD (0001603)	01 - Clear	01 - Daylight	01 - Traffic signal	0	02 - Non-fatal injury	02 - Angle	01 - Dry	0	0	0	0
8/13/2021	2021	15:00	CEDARVIEW RD @ FALLOWFIELD RD (0001603)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
11/3/2021	2021	17:18	CEDARVIEW RD @ FALLOWFIELD RD (0001603)	01 - Clear	05 - Dusk	01 - Traffic signal	0	03 - P.D. only	02 - Angle	01 - Dry	0	0	0	0
5/5/2022	2022	22:00	CEDARVIEW RD @ FALLOWFIELD RD (0001603)	01 - Clear	07 - Dark	01 - Traffic signal	0	03 - P.D. only	04 - SideSwipe	02 - Wet	0	0	0	0
7/7/2022	2022	20:00	CEDARVIEW RD @ FALLOWFIELD RD (0001603)	01 - Clear	01 - Daylight	01 - Traffic signal	0	02 - Non-fatal injury	05 - Turning movement	01 - Dry	0	0	0	0
9/30/2022	2022	7:41	CEDARVIEW RD @ FALLOWFIELD RD (0001603)	01 - Clear	01 - Daylight	01 - Traffic signal	0	03 - P.D. only	03 - Rear end	03 - Wet	0	0	0	0
10/29/2018	2018	6:10	CEDARVIEW RD bwn FALLOWFIELD RD & WOODSIA AVE (001324A7)	02 - Rain	07 - Dark	10 - No control	0	02 - Non-fatal injury	07 - SMV other	03 - Wet	0	0	0	0
11/9/2018	2018	19:20	CEDARVIEW RD bwn FALLOWFIELD RD & WOODSIA AVE (001324A7)	03 - Snow	07 - Dark	10 - No control	0	03 - P.D. only	03 - Rear end	02 - Wet	0	0	0	0
9/4/2019	2019	17:30	CEDARVIEW RD bwn FALLOWFIELD RD & WOODSIA AVE (001324A7)	01 - Clear	01 - Daylight	10 - No control	0	03 - P.D. only	03 - Rear end	01 - Dry	0	0	0	0
12/25/2019	2019	20:01	CEDARVIEW RD bwn FALLOWFIELD RD & LYTHE AVE (001324A7)	01 - Clear	07 - Dark	10 - No control	0	02 - Non-fatal injury	05 - Turning movement	01 - Dry	0	0	0	0
9/16/2020														

Appendix F

TDM Checklist

TDM Measures Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

Legend		
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	
★	The measure is one of the most dependably effective tools to encourage the use of sustainable modes	

TDM measures: <i>Non-residential developments</i>		Check if proposed & add descriptions
1. TDM PROGRAM MANAGEMENT		
1.1 Program coordinator		
BASIC ★	1.1.1 Designate an internal coordinator, or contract with an external coordinator	<input type="checkbox"/>
1.2 Travel surveys		
BETTER	1.2.1 Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	<input type="checkbox"/>
2. WALKING AND CYCLING		
2.1 Information on walking/cycling routes & destinations		
BASIC	2.1.1 Display local area maps with walking/cycling access routes and key destinations at major entrances	<input checked="" type="checkbox"/>
2.2 Bicycle skills training		
<i>Commuter travel</i> BETTER ★	2.2.1 Offer on-site cycling courses for commuters, or subsidize off-site courses	<input type="checkbox"/>
2.3 Valet bike parking		
<i>Visitor travel</i> BETTER	2.3.1 Offer secure valet bike parking during public events when demand exceeds fixed supply (e.g. for festivals, concerts, games)	<input type="checkbox"/>

TDM measures: <i>Non-residential developments</i>		Check if proposed & add descriptions
3. TRANSIT		
3.1 Transit information		
BASIC	3.1.1 Display relevant transit schedules and route maps at entrances	<input checked="" type="checkbox"/>
BASIC	3.1.2 Provide online links to OC Transpo and STO information	<input type="checkbox"/>
BETTER	3.1.3 Provide real-time arrival information display at entrances	<input type="checkbox"/>
3.2 Transit fare incentives		
<i>Commuter travel</i>		
BETTER	3.2.1 Offer preloaded PRESTO cards to encourage commuters to use transit	<input type="checkbox"/>
BETTER ★	3.2.2 Subsidize or reimburse monthly transit pass purchases by employees	<input type="checkbox"/>
<i>Visitor travel</i>		
BETTER	3.2.3 Arrange inclusion of same-day transit fare in price of tickets (e.g. for festivals, concerts, games)	<input type="checkbox"/>
3.3 Enhanced public transit service		
<i>Commuter travel</i>		
BETTER	3.3.1 Contract with OC Transpo to provide enhanced transit services (e.g. for shift changes, weekends)	<input type="checkbox"/>
<i>Visitor travel</i>		
BETTER	3.3.2 Contract with OC Transpo to provide enhanced transit services (e.g. for festivals, concerts, games)	<input type="checkbox"/>
3.4 Private transit service		
<i>Commuter travel</i>		
BETTER	3.4.1 Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for shift changes, weekends)	<input type="checkbox"/>
<i>Visitor travel</i>		
BETTER	3.4.2 Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for festivals, concerts, games)	<input type="checkbox"/>

TDM measures: <i>Non-residential developments</i>		Check if proposed & add descriptions
4. RIDESHARING		
4.1 Ridematching service		
<i>Commuter travel</i>		
BASIC	★ 4.1.1 Provide a dedicated ridematching portal at OttawaRideMatch.com	<input type="checkbox"/>
4.2 Carpool parking price incentives		
<i>Commuter travel</i>		
BETTER	4.2.1 Provide discounts on parking costs for registered carpools	<input type="checkbox"/>
4.3 Vanpool service		
<i>Commuter travel</i>		
BETTER	4.3.1 Provide a vanpooling service for long-distance commuters	<input type="checkbox"/>
5. CARSHARING & BIKE SHARING		
5.1 Bikeshare stations & memberships		
BETTER	5.1.1 Contract with provider to install on-site bikeshare station for use by commuters and visitors	<input type="checkbox"/>
<i>Commuter travel</i>		
BETTER	5.1.2 Provide employees with bikeshare memberships for local business travel	<input type="checkbox"/>
5.2 Carshare vehicles & memberships		
<i>Commuter travel</i>		
BETTER	5.2.1 Contract with provider to install on-site carshare vehicles and promote their use by tenants	<input type="checkbox"/>
BETTER	5.2.2 Provide employees with carshare memberships for local business travel	<input type="checkbox"/>
6. PARKING		
6.1 Priced parking		
<i>Commuter travel</i>		
BASIC	★ 6.1.1 Charge for long-term parking (daily, weekly, monthly)	<input type="checkbox"/>
BASIC	6.1.2 Unbundle parking cost from lease rates at multi-tenant sites	<input type="checkbox"/>
<i>Visitor travel</i>		
BETTER	6.1.3 Charge for short-term parking (hourly)	<input type="checkbox"/>

TDM measures: <i>Non-residential developments</i>		Check if proposed & add descriptions
7. TDM MARKETING & COMMUNICATIONS		
7.1 Multimodal travel information		
<i>Commuter travel</i>		
BASIC	★ 7.1.1 Provide a multimodal travel option information package to new/relocating employees and students	<input checked="" type="checkbox"/>
<i>Visitor travel</i>		
BETTER	★ 7.1.2 Include multimodal travel option information in invitations or advertising that attract visitors or customers (e.g. for festivals, concerts, games)	<input type="checkbox"/>
7.2 Personalized trip planning		
<i>Commuter travel</i>		
BETTER	★ 7.2.1 Offer personalized trip planning to new/relocating employees	<input type="checkbox"/>
7.3 Promotions		
<i>Commuter travel</i>		
BETTER	7.3.1 Deliver promotions and incentives to maintain awareness, build understanding, and encourage trial of sustainable modes	<input type="checkbox"/>
8. OTHER INCENTIVES & AMENITIES		
8.1 Emergency ride home		
<i>Commuter travel</i>		
BETTER	★ 8.1.1 Provide emergency ride home service to non-driving commuters	<input type="checkbox"/>
8.2 Alternative work arrangements		
<i>Commuter travel</i>		
BASIC	★ 8.2.1 Encourage flexible work hours	<input type="checkbox"/>
BETTER	8.2.2 Encourage compressed workweeks	<input type="checkbox"/>
BETTER	★ 8.2.3 Encourage telework	<input type="checkbox"/>
8.3 Local business travel options		
<i>Commuter travel</i>		
BASIC	★ 8.3.1 Provide local business travel options that minimize the need for employees to bring a personal car to work	<input type="checkbox"/>
8.4 Commuter incentives		
<i>Commuter travel</i>		
BETTER	8.4.1 Offer employees a taxable, mode-neutral commuting allowance	<input type="checkbox"/>
8.5 On-site amenities		
<i>Commuter travel</i>		
BETTER	8.5.1 Provide on-site amenities/services to minimize mid-day or mid-commute errands	<input type="checkbox"/>

TDM Measures Checklist:
Residential Developments (multi-family, condominium or subdivision)

Legend		
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	
★	The measure is one of the most dependably effective tools to encourage the use of sustainable modes	

TDM measures: <i>Residential developments</i>	Check if proposed & add descriptions
1. TDM PROGRAM MANAGEMENT	
1.1 Program coordinator	
BASIC ★	1.1.1 Designate an internal coordinator, or contract with an external coordinator <input type="checkbox"/>
1.2 Travel surveys	
BETTER	1.2.1 Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress <input type="checkbox"/>
2. WALKING AND CYCLING	
2.1 Information on walking/cycling routes & destinations	
BASIC	2.1.1 Display local area maps with walking/cycling access routes and key destinations at major entrances (<i>multi-family, condominium</i>) <input checked="" type="checkbox"/>
2.2 Bicycle skills training	
BETTER	2.2.1 Offer on-site cycling courses for residents, or subsidize off-site courses <input type="checkbox"/>

TDM measures: <i>Residential developments</i>	Check if proposed & add descriptions
3. TRANSIT	
3.1 Transit information	
BASIC	3.1.1 Display relevant transit schedules and route maps at entrances (<i>multi-family, condominium</i>) <input checked="" type="checkbox"/>
BETTER	3.1.2 Provide real-time arrival information display at entrances (<i>multi-family, condominium</i>) <input type="checkbox"/>
3.2 Transit fare incentives	
BASIC ★	3.2.1 Offer PRESTO cards preloaded with one monthly transit pass on residence purchase/move-in, to encourage residents to use transit <input type="checkbox"/>
BETTER	3.2.2 Offer at least one year of free monthly transit passes on residence purchase/move-in <input type="checkbox"/>
3.3 Enhanced public transit service	
BETTER ★	3.3.1 Contract with OC Transpo to provide early transit services until regular services are warranted by occupancy levels (<i>subdivision</i>) <input checked="" type="checkbox"/>
3.4 Private transit service	
BETTER	3.4.1 Provide shuttle service for seniors homes or lifestyle communities (e.g. scheduled mall or supermarket runs) <input type="checkbox"/>
4. CARSHARING & BIKE SHARING	
4.1 Bikeshare stations & memberships	
BETTER	4.1.1 Contract with provider to install on-site bikeshare station (<i>multi-family</i>) <input type="checkbox"/>
BETTER	4.1.2 Provide residents with bikeshare memberships, either free or subsidized (<i>multi-family</i>) <input type="checkbox"/>
4.2 Carshare vehicles & memberships	
BETTER	4.2.1 Contract with provider to install on-site carshare vehicles and promote their use by residents <input checked="" type="checkbox"/>
BETTER	4.2.2 Provide residents with carshare memberships, either free or subsidized <input type="checkbox"/>
5. PARKING	
5.1 Priced parking	
BASIC ★	5.1.1 Unbundle parking cost from purchase price (<i>condominium</i>) <input type="checkbox"/>
BASIC ★	5.1.2 Unbundle parking cost from monthly rent (<i>multi-family</i>) <input type="checkbox"/>

TDM measures: <i>Residential developments</i>		Check if proposed & add descriptions
6. TDM MARKETING & COMMUNICATIONS		
6.1 Multimodal travel information		
BASIC	★ 6.1.1 Provide a multimodal travel option information package to new residents	<input checked="" type="checkbox"/>
6.2 Personalized trip planning		
BETTER	★ 6.2.1 Offer personalized trip planning to new residents	<input type="checkbox"/>

Appendix G

TRANS Model Plots

TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Peak Hour Total Traffic Volume

Cedarview Road Area

2011 Model - Basecase

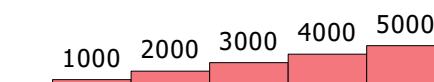
N/A



User Initials: MANS
Plot Prepared: July 24, 2023
EMME Scenario: 21713

Legend

AM Peak Hour Total Traffic Volume



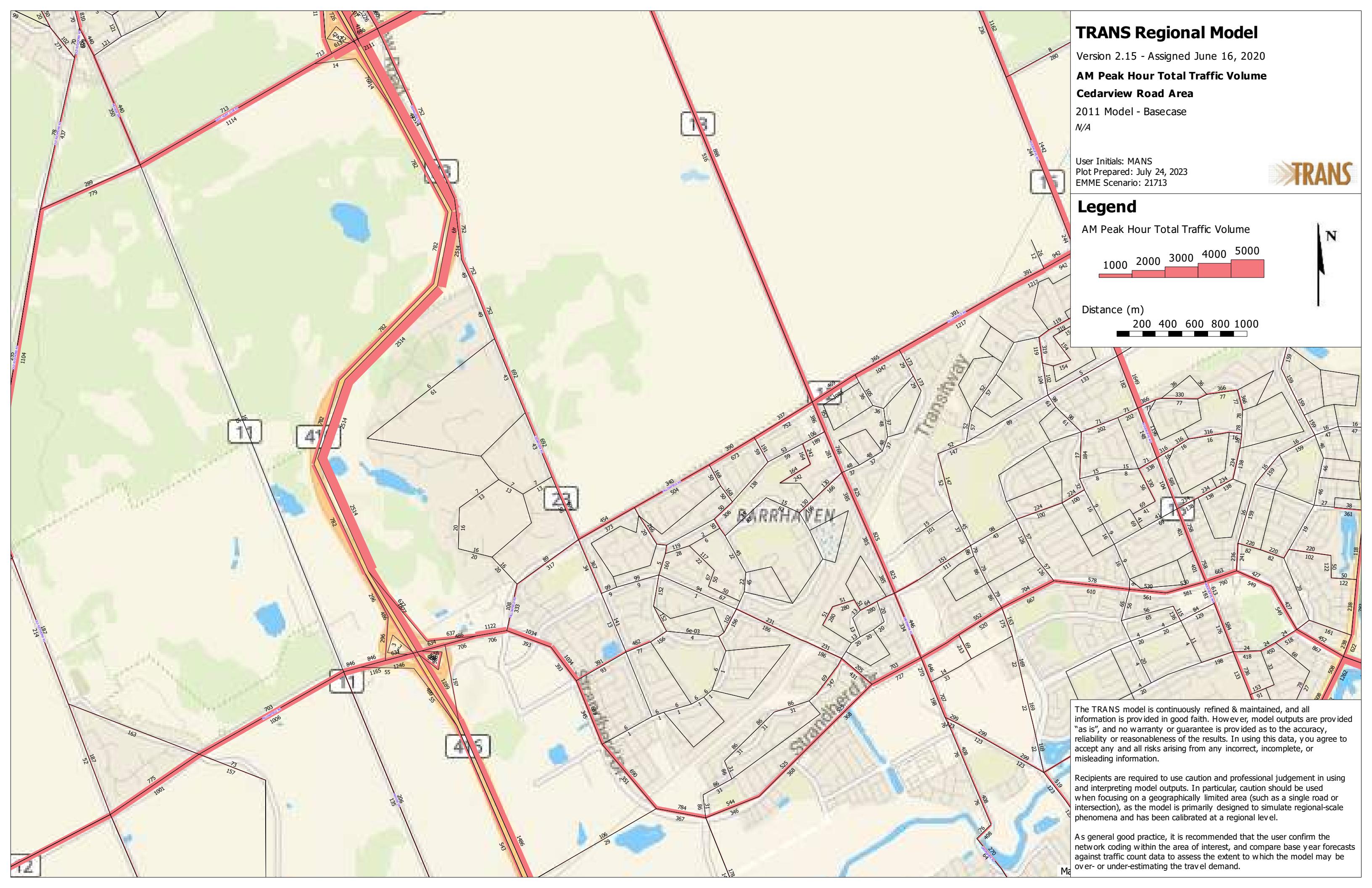
Distance (m)

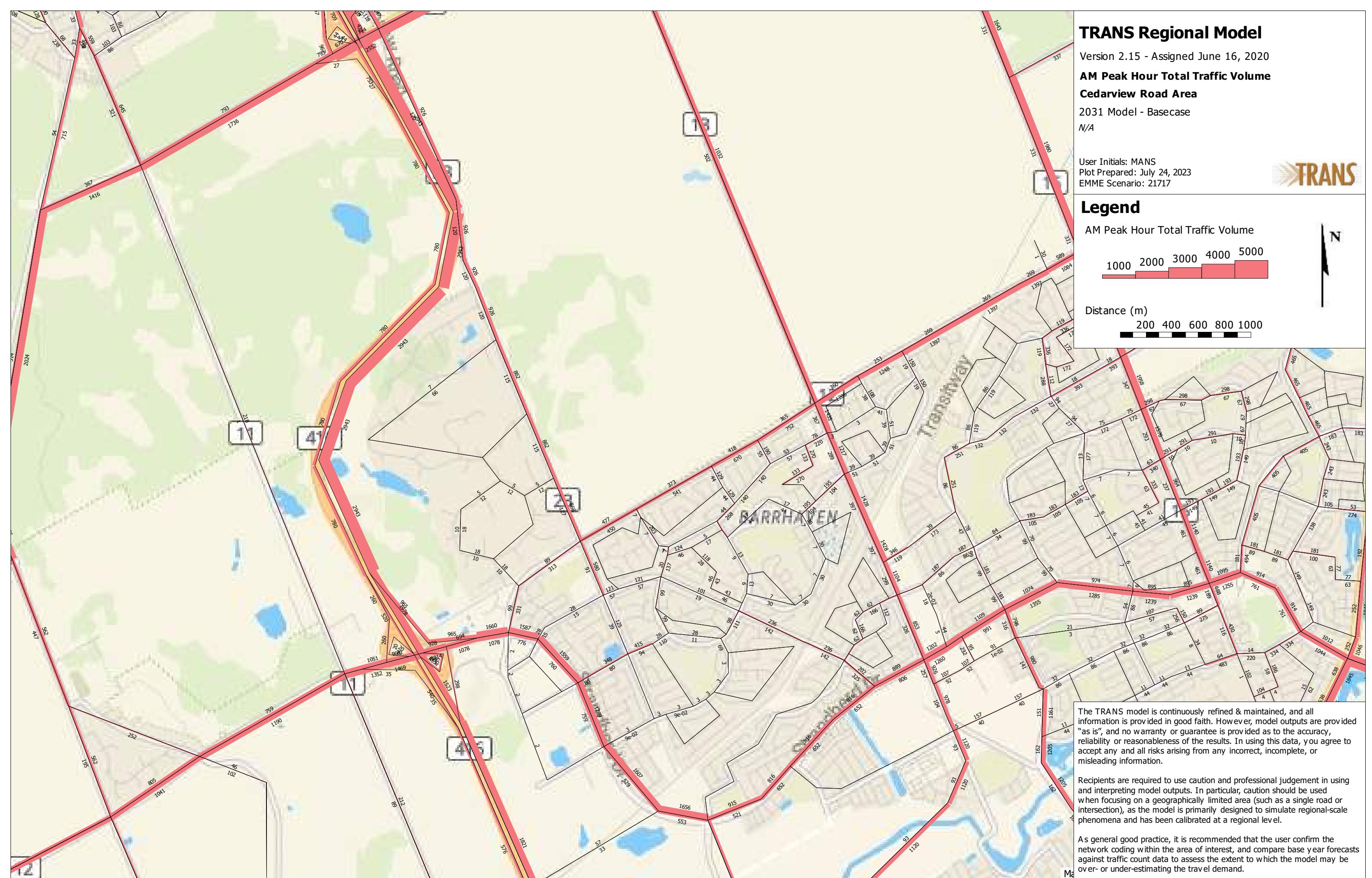


The TRANS model is continuously refined & maintained, and all information is provided in good faith. However, model outputs are provided "as is", and no warranty or guarantee is provided as to the accuracy, reliability or reasonableness of the results. In using this data, you agree to accept any and all risks arising from any incorrect, incomplete, or misleading information.

Recipients are required to use caution and professional judgement in using and interpreting model outputs. In particular, caution should be used when focusing on a geographically limited area (such as a single road or intersection), as the model is primarily designed to simulate regional-scale phenomena and has been calibrated at a regional level.

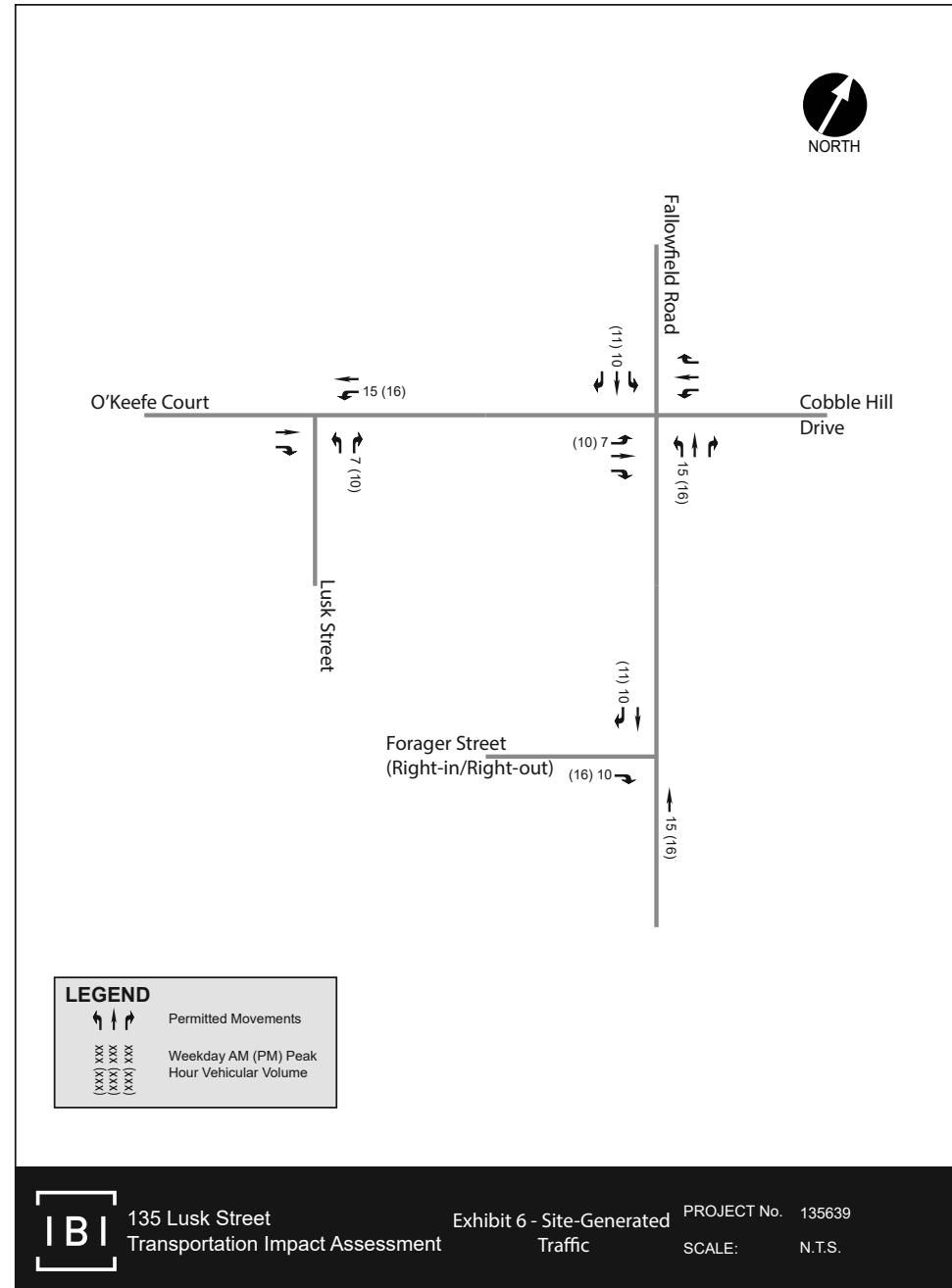
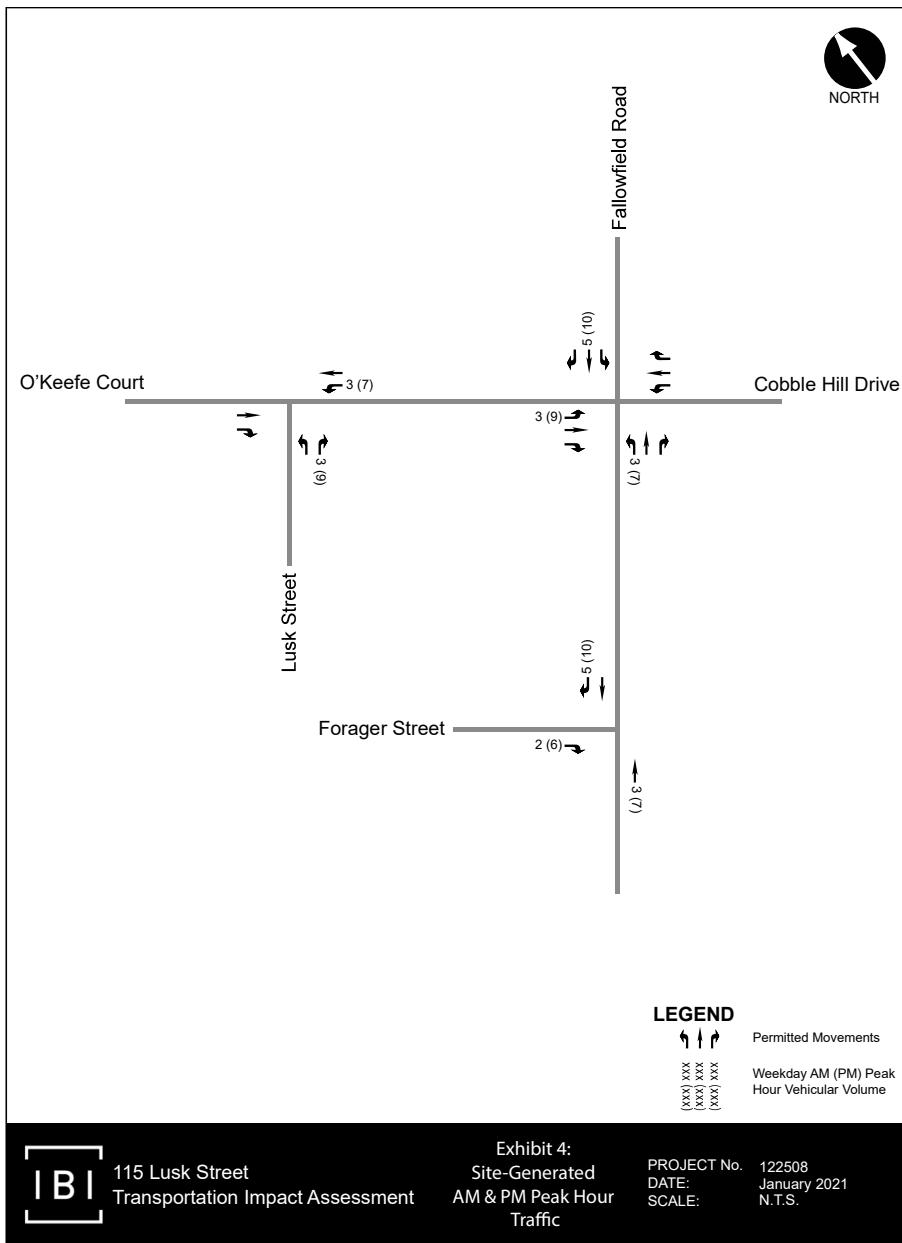
As general good practice, it is recommended that the user confirm the network coding within the area of interest, and compare base year forecasts against traffic count data to assess the extent to which the model may be over- or under-estimating the travel demand.





Appendix H

Background Development Volumes



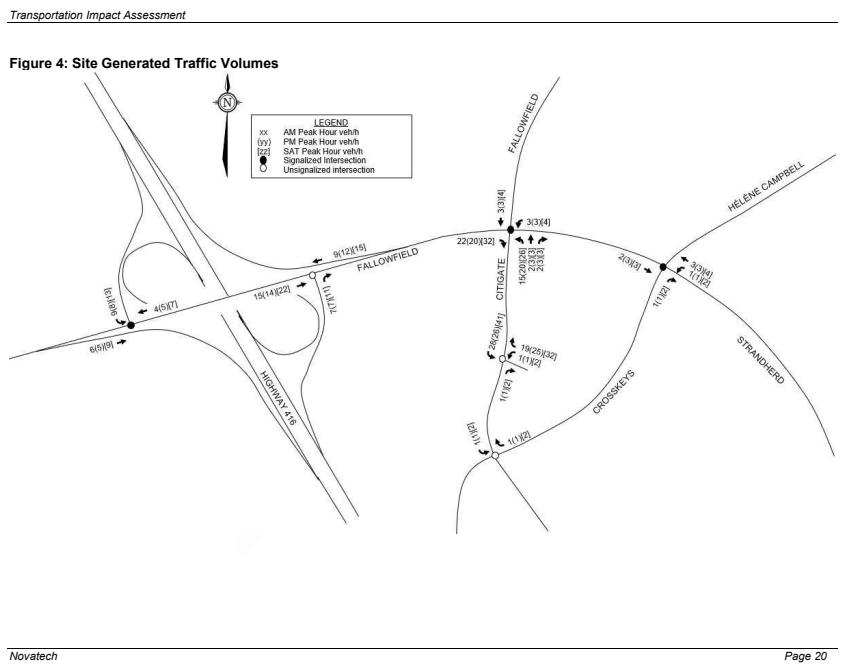
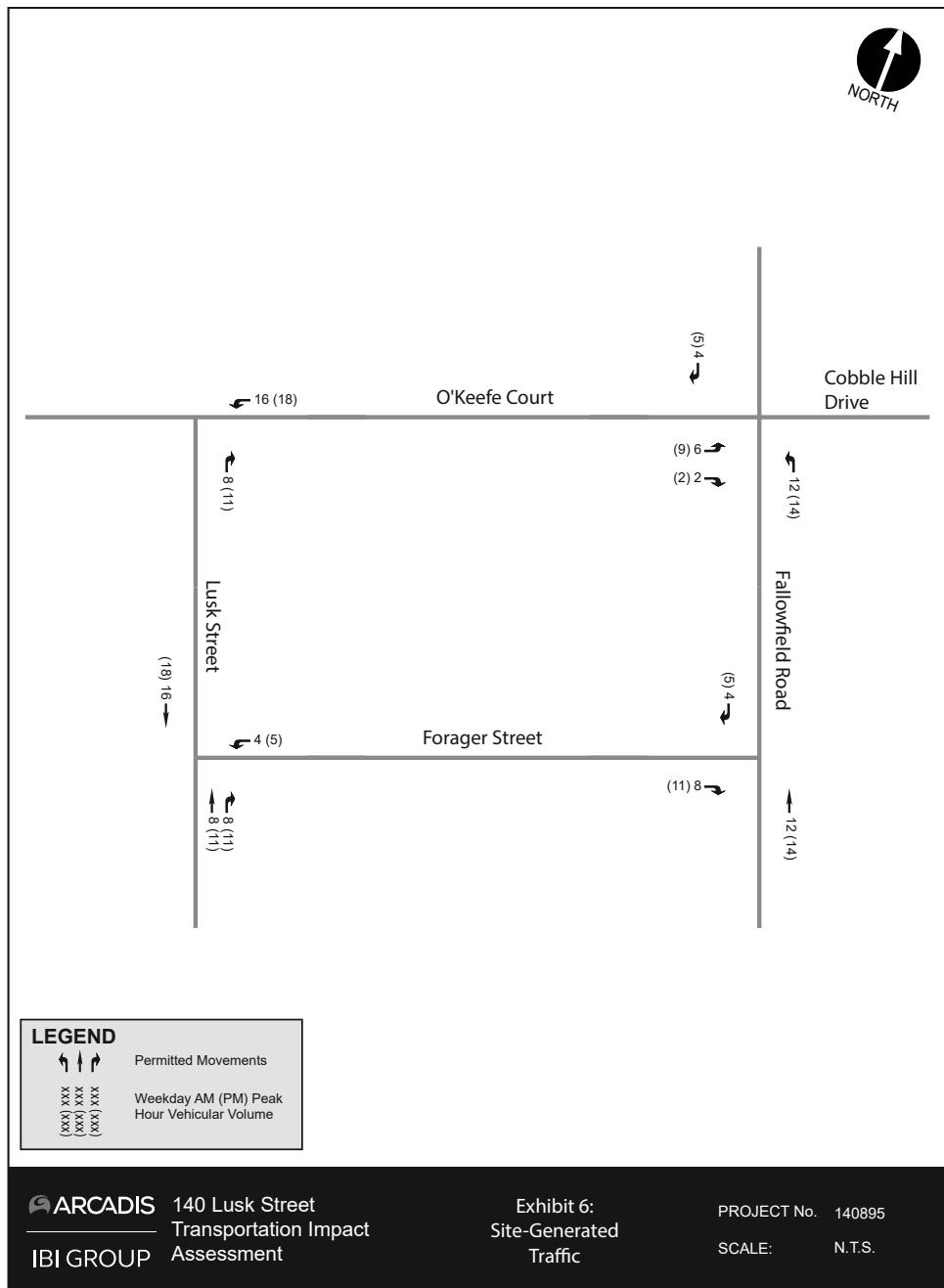
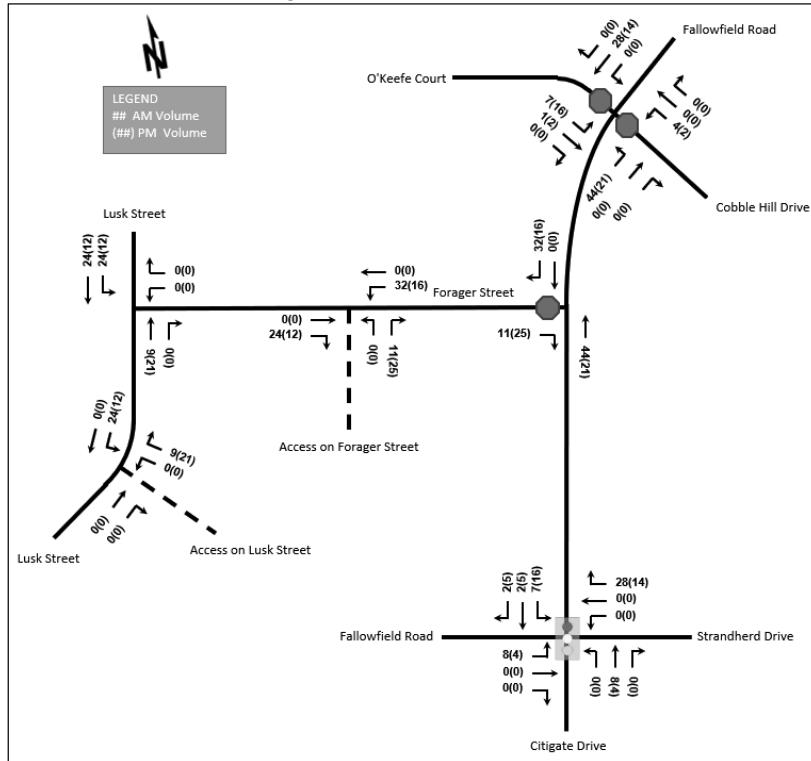


Figure 12: New Site Generation Auto Volumes



4.3 Other CitiGate Traffic

Trips generated by the car dealerships as well as developments at 4175/4149 Strandherd Drive (Blocks 3 and 4) are anticipated to generate traffic to/from Strandherd Drive and not utilize the internal Business Park intersections. The following table shows person trips generated by the proposed/future uses within the CitiGate Business Park that are anticipated to generate traffic at the internal intersections.

Peak hour of site traffic for the neighboring Amazon facility is anticipated to occur at 6:00AM-7:00AM and 5:30PM-6:30PM, due to the nature of shift work anticipated at this facility. Based on the recent traffic counts, the weekday peak hour of adjacent road traffic along Strandherd Drive typically occurs between 7:45AM-8:45AM and from 4:00PM-5:00PM. While Amazon site traffic and peak hour of road traffic are not expected to coincide, the Amazon site traffic has been superimposed on peak hour of road traffic for this memo. This will result in a more conservative and robust analysis.

Table 4: Other CitiGate Traffic - Person Trips

Land Use	ITE Code	Size	AM Peak			PM Peak		
			IN	OUT	TOT	IN	OUT	TOT
<i>Amazon Distribution Facility</i>								
Distribution Facility	-	2,728,000 ft ²	519	538	1057	679	691	1370
<i>Proposed Hotel – 101 CitiGate</i>								
Phase 1 – Hotel	310	99 rooms	34	23	57	32	30	62
Phase 2 – Hotel	310	85 rooms	26	19	45	23	22	45
<i>Future Hotel – 4433 Strandherd</i>								
Phase 1 – Hotel	310	120 rooms	37	31	68	40	38	78
Phase 1 – Restaurant	932	5,000 ft ²	33	28	61	35	23	58
Phase 2 – Hotel	310	135 rooms	44	33	77	47	45	92
Phase 2 – Restaurant	932	5,000 ft ²	33	28	61	35	23	58
<i>Future Warehouse - 575 Dealership</i>								
Warehouse	150	320,000 ft ²	54	15	69	20	54	74
<i>Future Prestige Business Park (lands south of Dealership Drive)</i>								
Office Park	750	500,000 ft ²	756	95	851	116	718	834
<i>Future Business Park (lands south of Dealership Drive)</i>								
Business Park	770	275,000 ft ²	388	68	456	119	338	457

Modal shares are anticipated to be consistent with recent traffic studies prepared for the above developments or the overall 2012 CitiGate CTS. Vehicle trips generated by the proposed/future uses within the CitiGate Business Park are shown in **Table 5**.

Trips generated by the Amazon facility and the proposed hotel at 101 CitiGate Drive have been assigned using the assumptions outlined in their respective traffic studies. Trips generated by the hotel at 4433 Strandherd Drive have been assigned in a similar manner to the traffic study for the hotel at 101 CitiGate Drive. Trips generated by the future warehouse, prestige business park and business park lands have been assigned in a manner consistent with the 2012 CTS.

The Amazon facility and proposed hotel at 101 CitiGate Drive have been assumed to be in place for the subject site buildout year. For the ultimate development scenario, the McKenna Casey Drive realignment is anticipated to be in place and 5% of Amazon traffic destined to the west has been reassigned to this connection. All other developments and the McKenna Casey Drive realignment are assumed to be in place for the ultimate condition.

Table 5: Other CitiGate Traffic – Vehicle Trips

Land Use	Auto Driver Share	Size	AM Peak			PM Peak		
			IN	OUT	TOT	IN	OUT	TOT
<i>Amazon Distribution Facility</i>								
Distribution Facility	56%	2,728,000 ft ²	284	295	579	375	381	756
<i>Proposed Hotel – 101 CitiGate</i>								
Phases 1 and 2 (two hotels)	85%	184 rooms	51	36	87	47	44	91
<i>Future Hotel – 4433 Strandherd</i>								
Phases 1 and 2 (two hotels and two restaurants)	85%	255 rooms, 10,000 ft ² restaurant	125	102	227	133	110	243
<i>Future Warehouse - 575 Dealership</i>								
Warehouse	56%	320,000 ft ²	30	8	38	11	30	41
<i>Future Prestige Business Park (lands south of Dealership Drive)</i>								
Office Park	56%	500,000 ft ²	423	53	476	65	402	467
<i>Future Business Park (lands south of Dealership Drive)</i>								
Business Park	56%	275,000 ft ²	217	38	255	67	189	256

Background and total traffic volumes are shown in the following figures:

- **Figure 6** shows the background traffic (not including subject site) for the buildup year.
- **Figure 7** shows the background traffic (not including the subject site) for the ultimate condition.
- **Figure 8** shows the total traffic (including the subject site) for the buildup year.
- **Figure 9** shows the total traffic (including the subject site) for the ultimate condition.

Figure 6: Background Traffic - Buildout Year

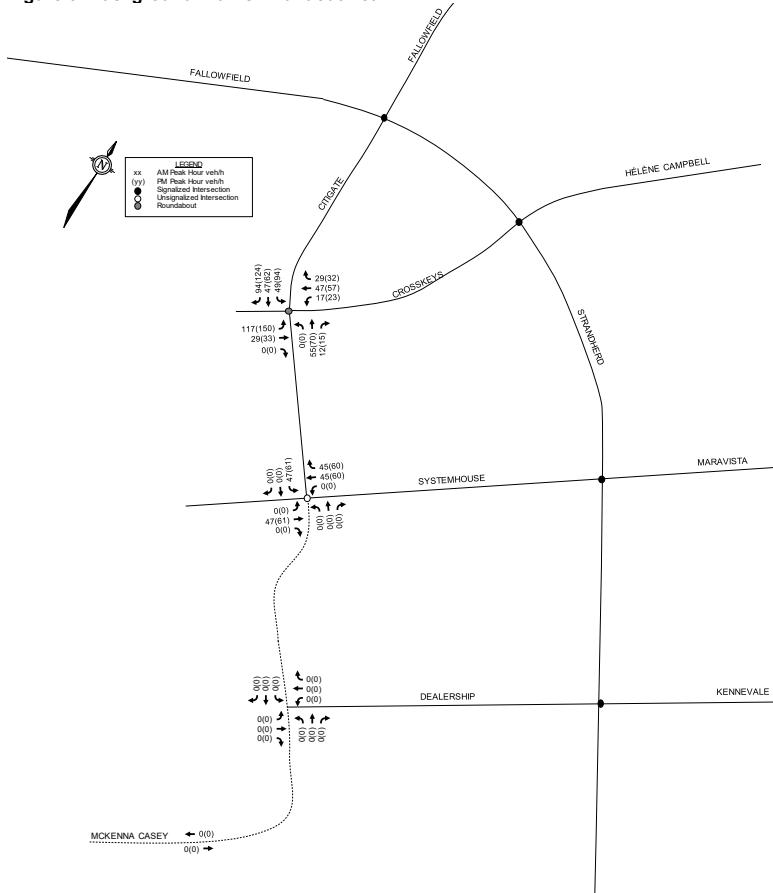


Figure 7: Background Traffic – Ultimate

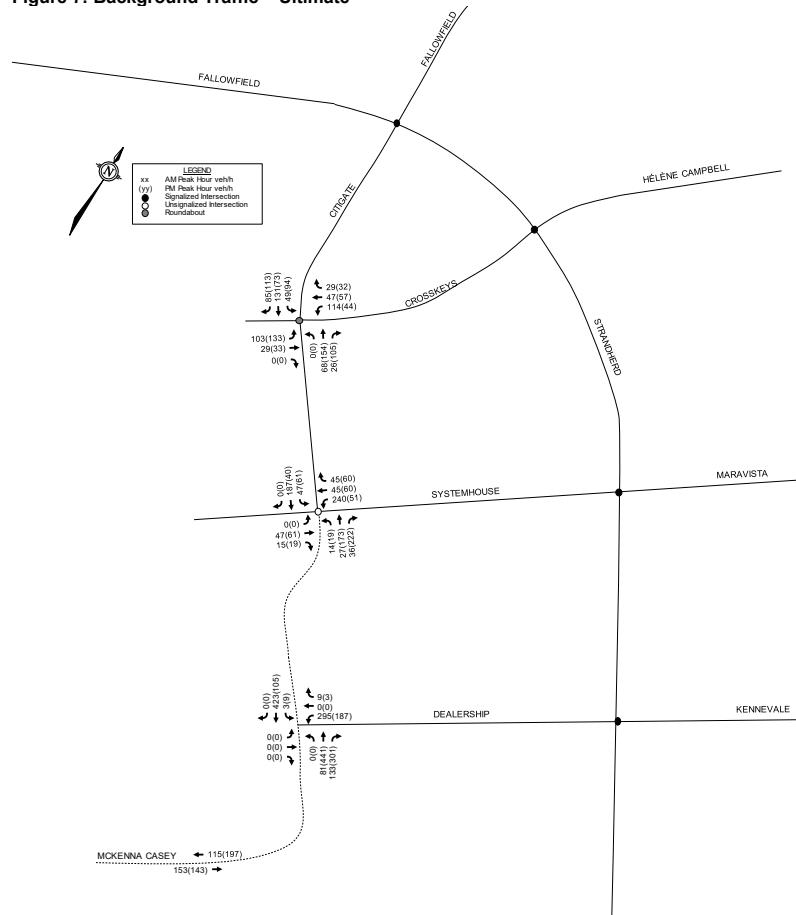


Figure 4: Site Traffic - Buildout Year

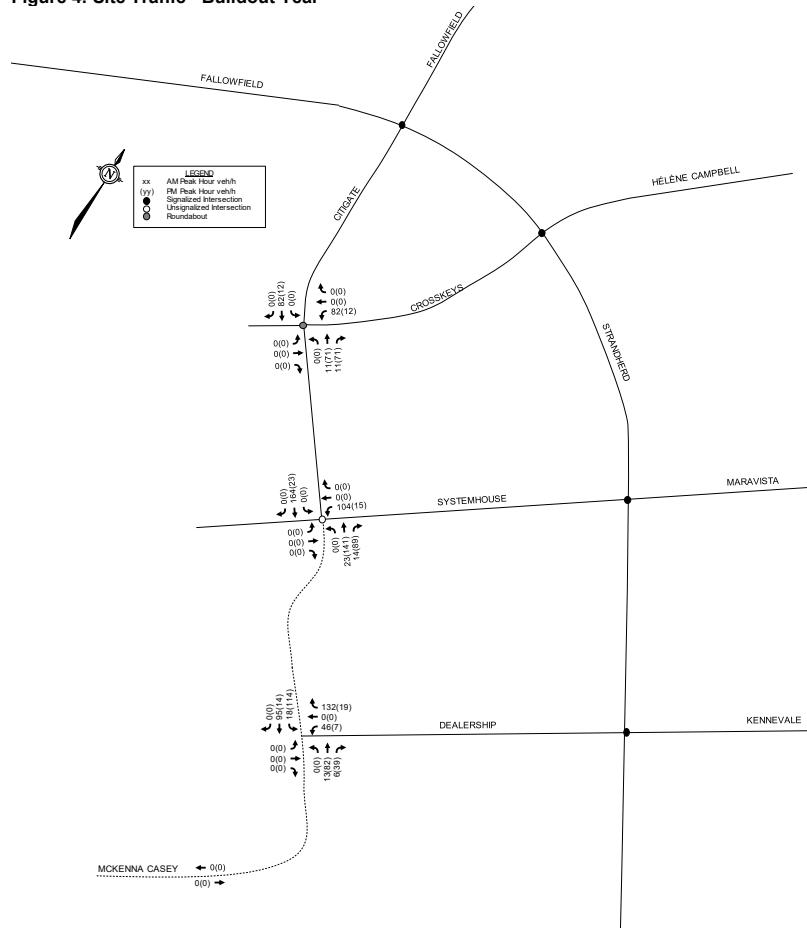
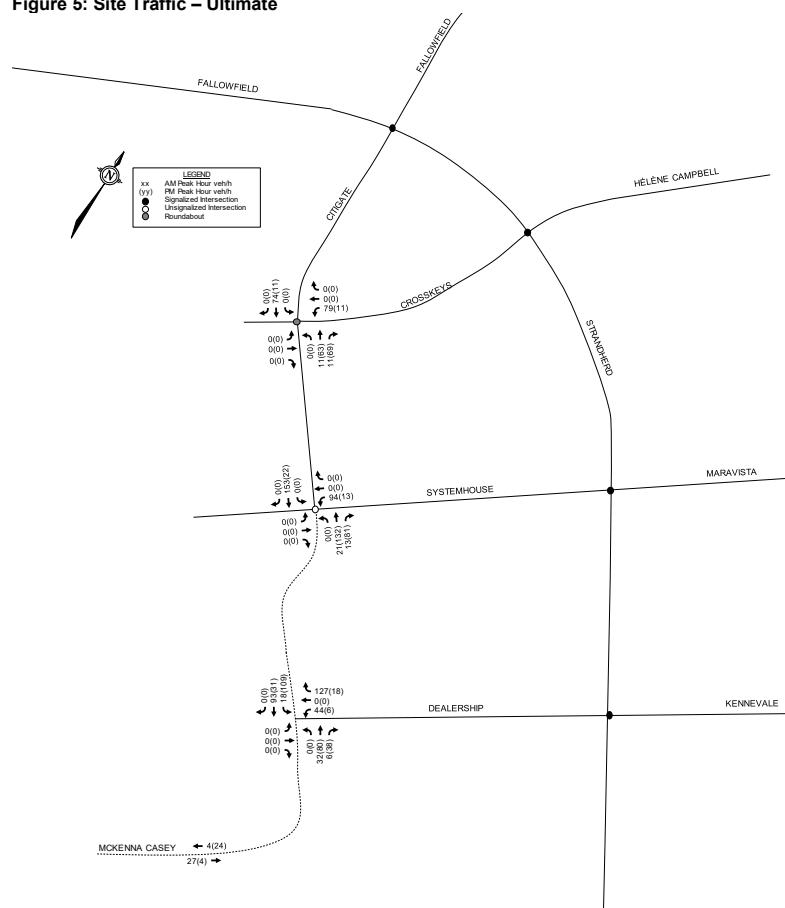


Figure 5: Site Traffic – Ultimate



Appendix I

Synchro Intersection Worksheets – 2038 Future Background Conditions

Intersection		2028 Future Background AM Peak Hour					
Int Delay, s/veh	0.4	4497 O'Keefe Court					
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	Y	Y	Y	Y	Y	Y	
Traffic Vol, veh/h	14	6	9	385	432	12	
Future Vol, veh/h	14	6	9	385	432	12	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	0	-	-	-	-	-	
Veh in Median Storage, #	0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	100	100	100	100	100	100	
Heavy Vehicles, %	14	2	11	2	2	17	
Mvmt Flow	14	6	9	385	432	12	
Major/Minor		Minor2	Major1	Major2			
Conflicting Flow All	841	438	444	0	-	0	
Stage 1	438	-	-	-	-	-	
Stage 2	403	-	-	-	-	-	
Critical Hdwy	6.54	6.22	4.21	-	-	-	
Critical Hdwy Stg 1	5.54	-	-	-	-	-	
Critical Hdwy Stg 2	5.54	-	-	-	-	-	
Follow-up Hdwy	3.626	3.318	2.299	-	-	-	
Pot Cap-1 Maneuver	319	619	1070	-	-	-	
Stage 1	626	-	-	-	-	-	
Stage 2	650	-	-	-	-	-	
Platoon blocked, %	-	-	-	-	-	-	
Mov Cap-1 Maneuver	315	619	1070	-	-	-	
Mov Cap-2 Maneuver	315	-	-	-	-	-	
Stage 1	619	-	-	-	-	-	
Stage 2	650	-	-	-	-	-	
Approach		EB	NB	SB			
HCM Control Delay, s	15.3	0.2	0				
HCM LOS	C						
Minor Lane/Major Mvmt		NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1070	-	369	-	-	-	
HCM Lane V/C Ratio	0.008	-	0.054	-	-	-	
HCM Control Delay (s)	8.4	0	15.3	-	-	-	
HCM Lane LOS	A	A	C	-	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	-	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Traffic Volume (vph)	476	1201	249	38	1775	83	66	35	10	59	125	437
Future Volume (vph)	476	1201	249	38	1775	83	66	35	10	59	125	437
Satd. Flow (prot)	3066	3103	1401	1353	3221	1483	2929	1401	0	1658	1664	1469
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3066	3103	1401	1353	3221	1483	2927	1401	0	1658	1664	1450
Satd. Flow (RTOR)			240				225			10		371
Lane Group Flow (vph)	476	1201	249	38	1775	83	66	45	0	59	125	437
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	
Protected Phases	13	2		9	6		7	4	3	8		8
Permitted Phases						6						
Detector Phase	13	2	2	9	6	6	7	4	3	8		8
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	12.1	29.9	29.9	12.1	29.9	29.9	11.5	48.0	11.5	48.0	48.0	
Total Split (s)	28.0	46.0	46.0	13.0	31.0	31.0	13.0	48.0	13.0	48.0	48.0	
Total Split (%)	23.3%	38.3%	38.3%	10.8%	25.8%	25.8%	10.8%	40.0%	10.8%	40.0%	40.0%	
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.5	2.3	2.3	2.5	2.3	2.3	2.8	3.3	2.8	3.3	3.3	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.1	6.9	6.9	7.1	6.9	6.9	6.5	7.0	6.5	7.0	7.0	
Lead/Lag							Lag	Lead	Lag	Lead	Lead	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	24.2	63.1	63.1	9.1	45.4	45.4	8.1	10.5	14.9	17.2	17.2	
Actuated g/C Ratio	0.20	0.53	0.53	0.08	0.38	0.38	0.07	0.09	0.12	0.14	0.14	
v/c Ratio	0.77	0.74	0.29	0.37	1.46	0.12	0.34	0.34	0.29	0.53	0.83	
Control Delay	54.0	29.7	4.7	62.2	239.5	0.3	57.4	49.6	47.8	53.7	22.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.0	29.7	4.7	62.2	239.5	0.3	57.4	49.6	47.8	53.7	22.7	
LOS	D	C	A	E	F	A	E	D	D	D	C	
Approach Delay				225.4				54.2		31.4		
Approach LOS				F				D		C		
Queue Length 50th (m)	54.6	115.7	1.0	8.7	~301.3	0.0	7.7	7.9	13.1	28.4	14.5	
Queue Length 95th (m)	70.7	#219.2	19.4	19.5	#416.8	0.0	14.6	19.4	22.4	40.9	47.9	
Internal Link Dist (m)		441.7			233.3				132.8		356.4	
Turn Bay Length (m)	127.0		96.5	95.0			90.0	90.0		140.0		125.0
Base Capacity (vph)	627	1632	850	102	1219	701	200	485	206	568		739
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.74	0.29	0.37	1.46	0.12	0.33	0.09	0.29	0.22	0.59	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 101 (84%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 145

Control Type: Actuated-Coordinated

Lanes, Volumes, Timings
2: Citigate & Fallowfield & Strandherd

Maximum v/c Ratio: 1.46

Intersection Signal Delay: 113.2

Intersection LOS: F

Intersection Capacity Utilization 102.4%

ICU Level of Service G

Analysis Period (min) 15

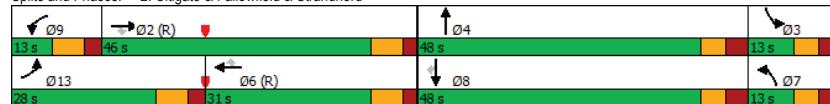
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 2: Citigate & Fallowfield & Strandherd



2028 Future Background AM Peak Hour
4497 O'Keefe Court

HCM 2010 TWSC
3: Cobble Hill/O'Keefe & Fallowfield

2028 Future Background AM Peak Hour
4497 O'Keefe Court

Intersection

Int Delay, s/veh 5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
----------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Lane Configurations	1	2	1	2	1	2	1	2	1	2	1	2
---------------------	---	---	---	---	---	---	---	---	---	---	---	---

Traffic Vol, veh/h	92	597	11	15	593	11	34	2	52	32	4	18
--------------------	----	-----	----	----	-----	----	----	---	----	----	---	----

Future Vol, veh/h	92	597	11	15	593	11	34	2	52	32	4	18
-------------------	----	-----	----	----	-----	----	----	---	----	----	---	----

Conflicting Peds, #/hr	0	0	0	0	0	0	0	1	1	0	0	0
------------------------	---	---	---	---	---	---	---	---	---	---	---	---

Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
--------------	------	------	------	------	------	------	------	------	------	------	------	------

RT Channelized	-	-	-	-	-	-	-	-	-	-	-	-
----------------	---	---	---	---	---	---	---	---	---	---	---	---

Storage Length	147.5	-	0	-	-	30.5	-	-	-	42.5	-	-
----------------	-------	---	---	---	---	------	---	---	---	------	---	---

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, %	11	4	9	7	5	14	2	50	2	33	67	2
-------------------	----	---	---	---	---	----	---	----	---	----	----	---

Mvmt Flow	92	597	11	15	593	11	34	2	52	32	4	18
-----------	----	-----	----	----	-----	----	----	---	----	----	---	----

Major/Minor	Major1	Major2	Minor1	Minor2
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Conflicting Flow All	604	0	0	608
----------------------	-----	---	---	-----

Stage 1	-	-	-	-
---------	---	---	---	---

Stage 2	-	-	-	-
---------	---	---	---	---

Critical Hdwy	4.21	-	4.17	-
---------------	------	---	------	---

Critical Hdwy Stg 1	-	-	-	-
---------------------	---	---	---	---

Critical Hdwy Stg 2	-	-	-	-
---------------------	---	---	---	---

Follow-up Hdwy	2.299	-	2.263	-
----------------	-------	---	-------	---

Pot Cap-1 Maneuver	931	-	946	-
--------------------	-----	---	-----	---

Stage 1	-	-	-	-
---------	---	---	---	---

Stage 2	-	-	-	-
---------	---	---	---	---

Platoon blocked, %	-	-	-	-
--------------------	---	---	---	---

Mov Cap-1 Maneuver	931	-	946	-
--------------------	-----	---	-----	---

Mov Cap-2 Maneuver	-	-	-	-
--------------------	---	---	---	---

Stage 1	-	-	-	-
---------	---	---	---	---

Stage 2	-	-	-	-
---------	---	---	---	---

Approach	EB	WB	NB	SB
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HCM Control Delay, s	1.2	0.2	41	57.1
----------------------	-----	-----	----	------

HCM LOS			E	F
---------	--	--	---	---

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
-----------------------	-------	-----	-----	-----	-----	-----	-----	-------	-------

Capacity (veh/h)	185	931	-	-	946	-	-	76	275
------------------	-----	-----	---	---	-----	---	---	----	-----

HCM Lane V/C Ratio	0.476	0.099	-	-	0.016	-	-	0.421	0.08
--------------------	-------	-------	---	---	-------	---	---	-------	------

HCM Control Delay (s)	41	9.3	-	-	8.9	-	-	83.2	19.2
-----------------------	----	-----	---	---	-----	---	---	------	------

HCM Lane LOS	E	A	-	-	A	-	-	F	C
--------------	---	---	---	---	---	---	---	---	---

HCM 95th %tile Q(veh)	2.3	0.3	-	-	0	-	-	1.7	0.3
-----------------------	-----	-----	---	---	---	---	---	-----	-----

Lanes, Volumes, Timings
4: Cedarview & Fallowfield

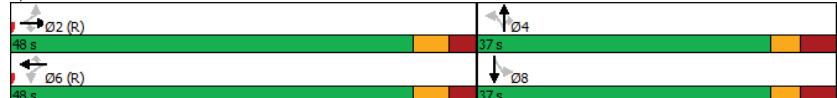
2028 Future Background AM Peak Hour
4497 O'Keefe Court

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	→	↓	←	↑	←	↑	↑	↑	↑	↓	↑
Traffic Volume (vph)	47	787	10	32	556	181	49	359	278	204	129	12
Future Volume (vph)	47	787	10	32	556	181	49	359	278	204	129	12
Satd. Flow (prot)	1658	1712	1261	1537	1728	1483	1658	1745	1469	1642	1686	0
Flt Permitted	0.341						0.667				0.389	
Satd. Flow (perm)	595	1712	1234	269	1728	1483	1164	1745	1469	672	1686	0
Satd. Flow (RTOR)			49			181			128		6	
Lane Group Flow (vph)	47	787	10	32	556	181	49	359	278	204	141	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	2				6				4			8
Permitted Phases	2		2	6	6	6	4	4	4	4	8	8
Detector Phase	2	2	2	6	6	6	4	4	4	4	8	8
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	48.0	48.0	48.0	48.0	48.0	48.0	37.0	37.0	37.0	37.0	37.0	37.0
Total Split (s)	48.0	48.0	48.0	48.0	48.0	48.0	37.0	37.0	37.0	37.0	37.0	37.0
Total Split (%)	56.5%	56.5%	56.5%	56.5%	56.5%	56.5%	43.5%	43.5%	43.5%	43.5%	43.5%	43.5%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.8	3.8	3.8	3.8	3.8	3.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8	6.8	6.8	6.8	6.8
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	44.8	44.8	44.8	44.8	44.8	44.8	26.7	26.7	26.7	26.7	26.7	26.7
Actuated g/C Ratio	0.53	0.53	0.53	0.53	0.53	0.53	0.31	0.31	0.31	0.31	0.31	0.31
v/c Ratio	0.15	0.87	0.01	0.23	0.61	0.21	0.13	0.66	0.51	0.97	0.26	
Control Delay	13.7	32.3	0.0	17.9	18.9	2.7	20.0	30.7	15.0	84.8	21.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	13.7	32.3	0.0	17.9	18.9	2.7	20.0	30.7	15.0	84.8	21.0	
LOS	B	C	A	B	B	A	B	C	B	F	C	
Approach Delay	30.9				15.0			23.5			58.7	
Approach LOS	C			B			C				E	
Queue Length 50th (m)	4.1	116.1	0.0	2.9	65.3	0.0	5.3	46.6	17.2	30.2	15.1	
Queue Length 95th (m)	10.5	#192.4	0.0	9.7	100.0	9.7	12.8	73.4	38.0	#69.0	28.2	
Internal Link Dist (m)	561.2			452.7			444.3			482.1		
Turn Bay Length (m)	60.0	55.0	60.0	55.0	180.0		80.0	45.5				
Base Capacity (vph)	313	901	673	141	910	866	413	619	604	238	602	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.15	0.87	0.01	0.23	0.61	0.21	0.12	0.58	0.46	0.86	0.23	
Intersection Summary												
Cycle Length: 85												
Actuated Cycle Length: 85												
Offset: 40 (47%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 85												
Control Type: Actuated-Coordinated												

Lanes, Volumes, Timings
4: Cedarview & Fallowfield

2028 Future Background AM Peak Hour
4497 O'Keefe Court

Maximum v/c Ratio: 0.97	Intersection Signal Delay: 28.0	Intersection LOS: C
	Intersection Capacity Utilization 92.5%	ICU Level of Service F
	Analysis Period (min) 15	
#	95th percentile volume exceeds capacity, queue may be longer.	
	Queue shown is maximum after two cycles.	
Splits and Phases: 4: Cedarview & Fallowfield		



Intersection							
Int Delay, s/veh	0.5						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	W		W		W		
Traffic Vol, veh/h	13	15	4	507	576	8	
Future Vol, veh/h	13	15	4	507	576	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	-	-	-	-	-	
Veh in Median Storage, #	0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	100	100	100	100	100	100	
Heavy Vehicles, %	8	7	2	2	2	2	
Mvmt Flow	13	15	4	507	576	8	
Major/Minor	Minor2	Major1	Major2				
Conflicting Flow All	1095	580	584	0	-	0	
Stage 1	580	-	-	-	-	-	
Stage 2	515	-	-	-	-	-	
Critical Hdwy	6.48	6.27	4.12	-	-	-	
Critical Hdwy Stg 1	5.48	-	-	-	-	-	
Critical Hdwy Stg 2	5.48	-	-	-	-	-	
Follow-up Hdwy	3.572	3.363	2.218	-	-	-	
Pot Cap-1 Maneuver	230	505	991	-	-	-	
Stage 1	548	-	-	-	-	-	
Stage 2	588	-	-	-	-	-	
Platoon blocked, %	-	-	-	-	-	-	
Mov Cap-1 Maneuver	229	505	991	-	-	-	
Mov Cap-2 Maneuver	229	-	-	-	-	-	
Stage 1	545	-	-	-	-	-	
Stage 2	588	-	-	-	-	-	
Approach	EB	NB	SB				
HCM Control Delay, s	17.2	0.1	0				
HCM LOS	C						
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR		
Capacity (veh/h)	991	-	324	-	-		
HCM Lane V/C Ratio	0.004	-	0.086	-	-		
HCM Control Delay (s)	8.6	0	17.2	-	-		
HCM Lane LOS	A	A	C	-	-		
HCM 95th %tile Q(veh)	0	-	0.3	-	-		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	W	W	W	W	W	W	W	W	W	W	W	W
Traffic Volume (vph)	419	1655	208	10	1873	116	371	168	43	124	89	505
Future Volume (vph)	419	1655	208	10	1873	116	371	168	43	124	89	505
Satd. Flow (prot)	3216	3316	1469	1127	3316	1483	3154	1639	0	1658	1664	1455
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3216	3316	1432	1127	3316	1483	3154	1639	0	1658	1664	1455
Satd. Flow (RTOR)			160			160			12			358
Lane Group Flow (vph)	419	1655	208	10	1873	116	371	211	0	124	89	505
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	
Protected Phases	13	2		9	6		7	4	3	8		8
Permitted Phases				2		6						
Detector Phase	13	2	2	9	6	6	7	4	3	8		8
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	12.1	29.9	29.9	12.1	29.9	29.9	11.5	48.0	11.5	48.0	48.0	
Total Split (s)	24.0	34.0	24.0	34.0	34.0	34.0	14.0	48.0	14.0	48.0	48.0	
Total Split (%)	20.0%	28.3%	28.3%	20.0%	28.3%	28.3%	11.7%	40.0%	11.7%	40.0%	40.0%	
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.5	2.3	2.3	2.5	2.3	2.3	2.8	3.3	2.8	3.3	3.3	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.1	6.9	6.9	7.1	6.9	6.9	6.5	7.0	6.5	7.0	7.0	
Lead/Lag							Lag	Lead	Lag	Lead	Lead	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	17.9	48.9	48.9	6.8	27.1	27.1	24.6	20.2	27.4	22.9	22.9	
Actuated g/C Ratio	0.15	0.41	0.41	0.06	0.23	0.23	0.20	0.17	0.23	0.19	0.19	
v/c Ratio	0.88	1.23	0.31	0.16	2.50	0.25	0.57	0.74	0.33	0.28	0.89	
Control Delay	70.2	140.4	8.9	58.8	701.7	3.4	49.3	59.7	43.5	40.1	31.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.2	140.4	8.9	58.8	701.7	3.4	49.3	59.7	43.5	40.1	31.1	
LOS	E	F	A	E	F	A	D	E	D	D	C	
Approach Delay		115.5			658.0			53.0			34.4	
Approach LOS		F			F			D			C	
Queue Length 50th (m)	50.2	~240.4	6.5	2.3	~386.4	0.0	40.4	45.1	24.6	18.4	37.0	
Queue Length 95th (m)	#79.9	#343.9	27.9	7.8	#428.7	6.0	#92.8	66.2	45.3	27.4	70.1	
Internal Link Dist (m)		441.7			233.3				132.8		356.4	
Turn Bay Length (m)	127.0		96.5	95.0			90.0	90.0		140.0		125.0
Base Capacity (vph)	478	1351	678	158	749	458	646	567	378	568		732
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	1.23	0.31	0.06	2.50	0.25	0.57	0.37	0.33	0.16	0.69	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green												
Natural Cycle: 145												
Control Type: Actuated-Coordinated												

Lanes, Volumes, Timings
2: Citigate & Fallowfield & Strandherd

Maximum v/c Ratio: 2.50

Intersection Signal Delay: 292.9

Intersection LOS: F

Intersection Capacity Utilization 115.8%

ICU Level of Service H

Analysis Period (min) 15

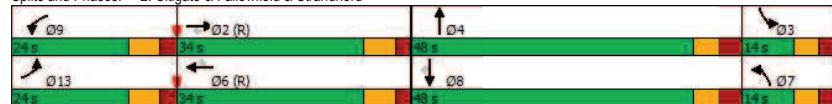
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 2: Citigate & Fallowfield & Strandherd



2038 Future BackgroundPM Peak Hour
4497 O'Keefe Court

HCM 2010 TWSC
3: Cobble Hill/O'Keefe & Fallowfield

2038 Future BackgroundPM Peak Hour
4497 O'Keefe Court

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	77	594	66	52	706	22	23	3	44	48	5	18
Future Vol, veh/h	77	594	66	52	706	22	23	3	44	48	5	18
Conflicting Peds, #/hr	0	0	1	1	0	0	0	0	2	2	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	-	-	-	-	-	-	-	-	-
Storage Length	147.5	-	0	-	-	30.5	-	-	42.5	-	-	-
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, %	11	3	2	2	5	2	24	2	2	2	2	13
Mvmt Flow	77	594	66	52	706	22	23	3	44	48	5	18

Major/Minor	Major1	Major2	Minor1	Minor2							
Conflicting Flow All	728	0	0	661							
Stage 1	-	-	-	-							
Stage 2	-	-	-	-							
Critical Hdwy	4.21	-	4.12	-							
Critical Hdwy Stg 1	-	-	-	-							
Critical Hdwy Stg 2	-	-	-	-							
Follow-up Hdwy	2.299	-	2.218	-							
Pot Cap-1 Maneuver	836	-	927	-							
Stage 1	-	-	-	-							
Stage 2	-	-	-	-							
Platoon blocked, %	-	-	-	-							
Mov Cap-1 Maneuver	836	-	926	-							
Mov Cap-2 Maneuver	-	-	-	-							
Stage 1	-	-	-	-							
Stage 2	-	-	-	-							
Approach	EB	WB	NB	SB							
HCM Control Delay, s	1	0.6	50.5	105.5							
HCM LOS	-	-	F	F							
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2		
Capacity (veh/h)	146	836	-	-	926	-	-	66	229		
HCM Lane V/C Ratio	0.479	0.092	-	-	0.056	-	-	0.727	0.1		
HCM Control Delay (s)	50.5	9.7	-	-	9.1	-	-	145.2	22.5		
HCM Lane LOS	F	A	-	-	A	-	-	F	C		
HCM 95th %tile Q(veh)	2.2	0.3	-	-	0.2	-	-	3.3	0.3		

Lanes, Volumes, Timings
4: Cedarview & Fallowfield

2038 Future BackgroundPM Peak Hour
4497 O'Keefe Court

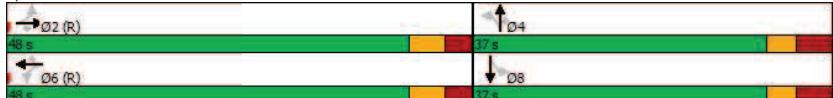
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	538	30	148	756	83	21	185	131	287	597	46
Future Volume (vph)	25	538	30	148	756	83	21	185	131	287	597	46
Satd. Flow (prot)	1658	1745	1483	1642	1728	1483	1537	1728	1469	1658	1724	0
Flt Permitted	0.150					0.132				0.641		
Satd. Flow (perm)	262	1745	1483	570	1728	1451	214	1728	1469	1119	1724	0
Satd. Flow (RTOR)			49			74			131		5	
Lane Group Flow (vph)	25	538	30	148	756	83	21	185	131	287	643	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2		2	6		6	4		4	8		
Detector Phase	2	2	2	6	6	6	4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	48.0	48.0	48.0	48.0	48.0	48.0	37.0	37.0	37.0	37.0	37.0	
Total Split (s)	48.0	48.0	48.0	48.0	48.0	48.0	37.0	37.0	37.0	37.0	37.0	
Total Split (%)	56.5%	56.5%	56.5%	56.5%	56.5%	43.5%	43.5%	43.5%	43.5%	43.5%	43.5%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.8	3.8	3.8	3.8	3.8	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8	6.8	6.8	6.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None	
Act Effct Green (s)	41.3	41.3	41.3	41.3	41.3	41.3	30.2	30.2	30.2	30.2	30.2	
Actuated g/C Ratio	0.49	0.49	0.49	0.49	0.49	0.49	0.36	0.36	0.36	0.36	0.36	
v/c Ratio	0.20	0.64	0.04	0.54	0.90	0.11	0.28	0.30	0.22	0.72	1.05	
Control Delay	17.4	20.5	2.0	24.1	36.3	4.1	31.2	21.5	4.7	36.2	77.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	17.4	20.5	2.0	24.1	36.3	4.1	31.2	21.5	4.7	36.2	77.7	
LOS	B	C	A	C	D	A	C	C	A	D	E	
Approach Delay		19.4			31.8			15.6			64.9	
Approach LOS		B			C			B			E	
Queue Length 50th (m)	2.2	62.0	0.0	15.9	107.0	0.7	2.4	21.3	0.0	39.8	~114.4	
Queue Length 95th (m)	7.8	94.7	2.5	35.5	#179.7	7.6	9.2	37.1	10.8	#76.1	#177.4	
Internal Link Dist (m)		561.2		452.7			444.3			482.1		
Turn Bay Length (m)	60.0		55.0	60.0		55.0	180.0		80.0		45.5	
Base Capacity (vph)	127	847	745	276	839	743	76	613	606	397	615	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.20	0.64	0.04	0.54	0.90	0.11	0.28	0.30	0.22	0.72	1.05	
Intersection Summary												
Cycle Length: 85												
Actuated Cycle Length: 85												
Offset: 40 (47%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 85												
Control Type: Actuated-Coordinated												

Lanes, Volumes, Timings
4: Cedarview & Fallowfield

2038 Future BackgroundPM Peak Hour
4497 O'Keefe Court

Maximum v/c Ratio: 1.05	Intersection Signal Delay: 38.1	Intersection LOS: D
	Intersection Capacity Utilization 117.3%	ICU Level of Service H
	Analysis Period (min) 15	
	~ Volume exceeds capacity, queue is theoretically infinite.	
	Queue shown is maximum after two cycles.	
	# 95th percentile volume exceeds capacity, queue may be longer.	
	Queue shown is maximum after two cycles.	

Splits and Phases: 4: Cedarview & Fallowfield

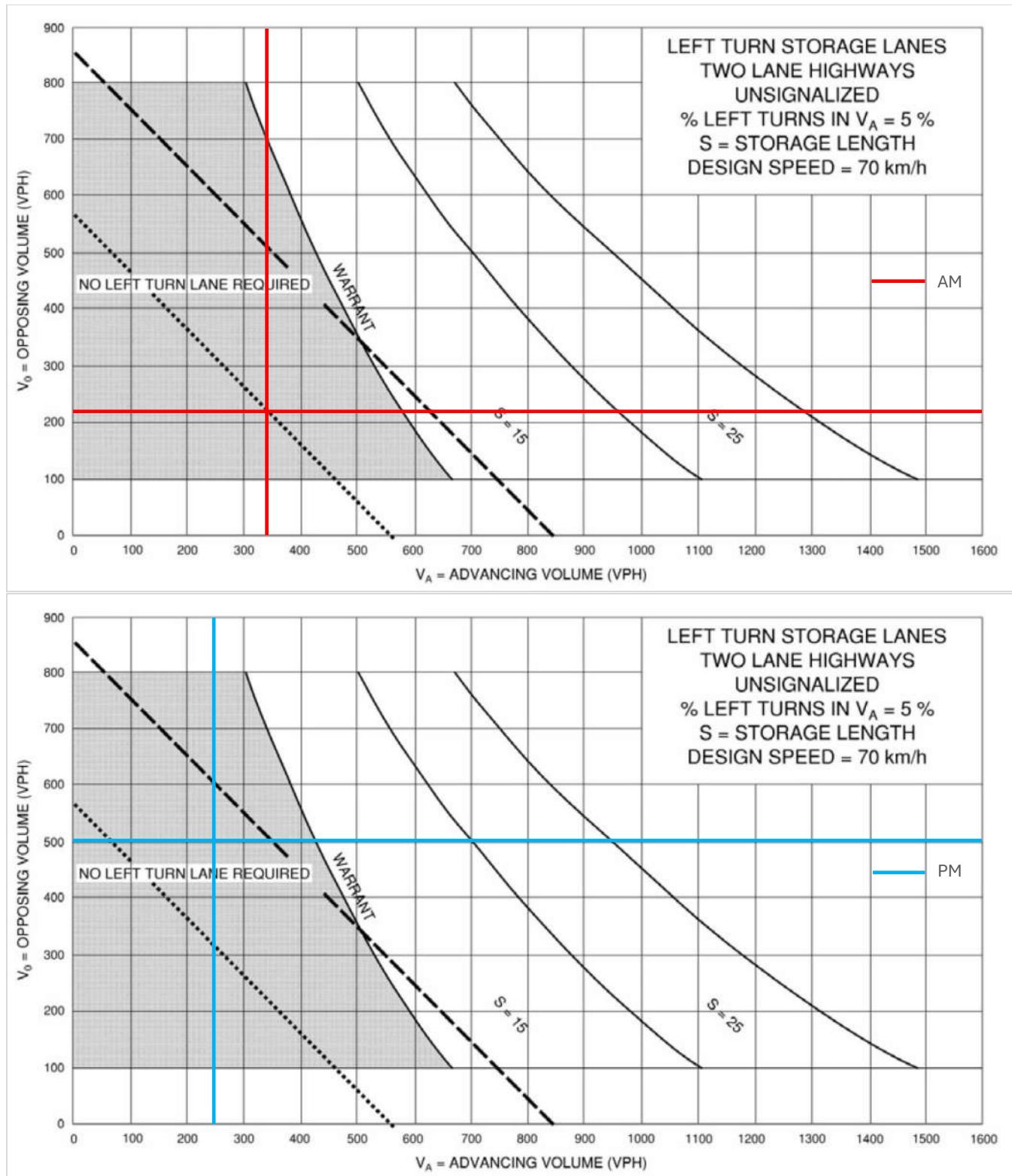


Appendix J

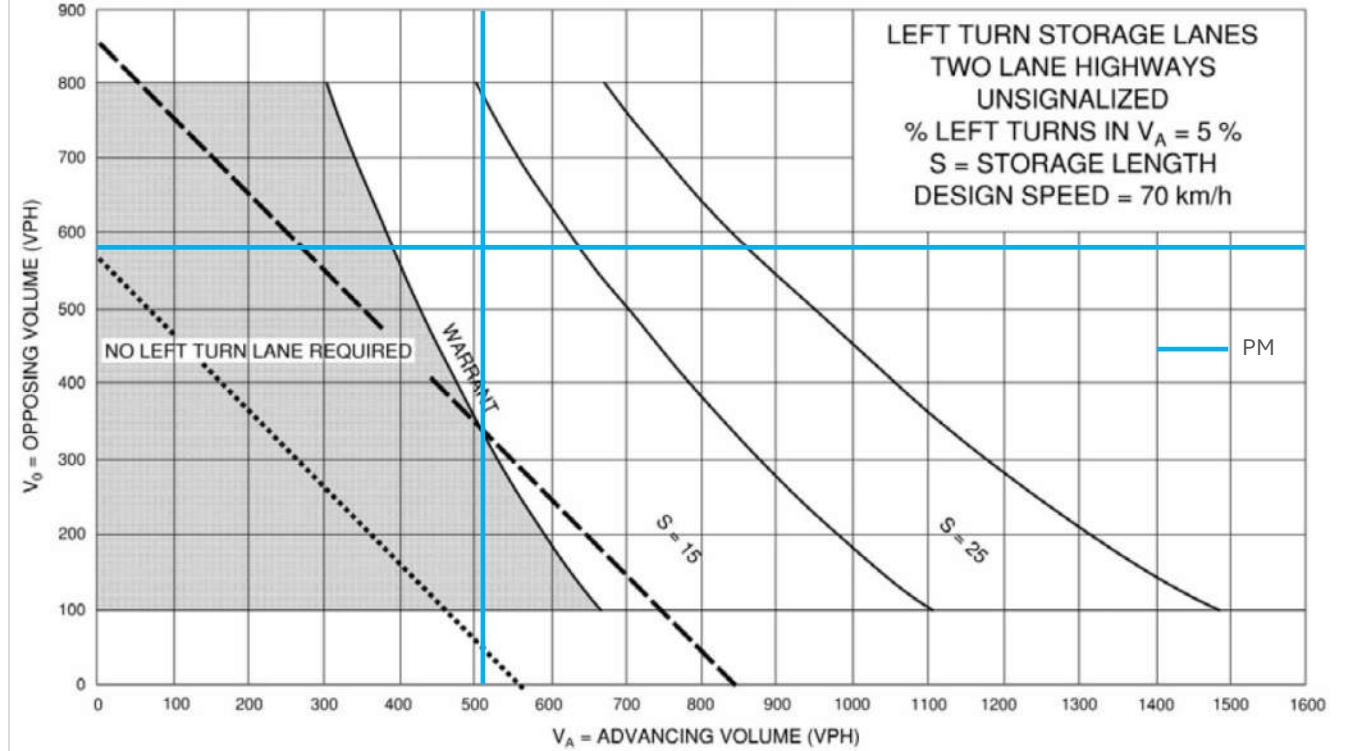
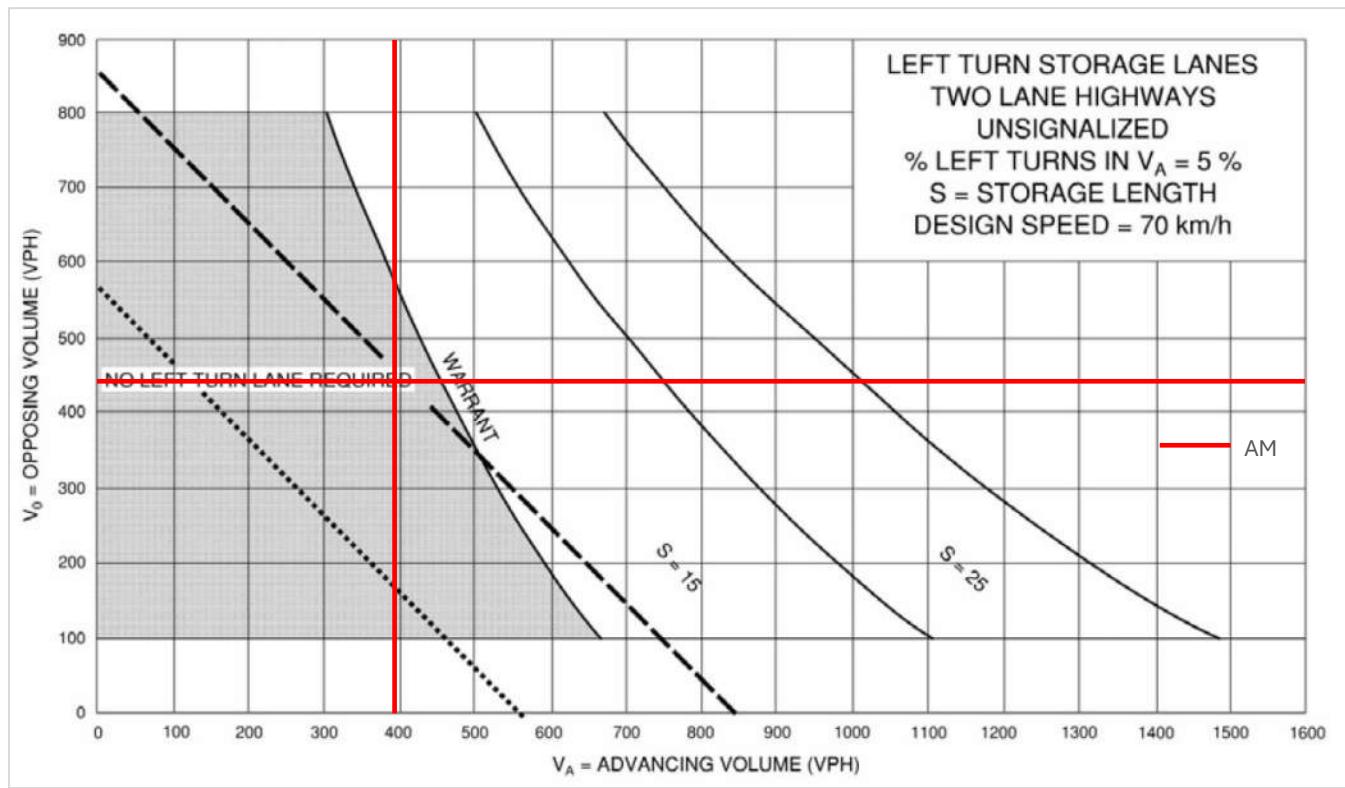
Turn-Lane Warrants

Cedarview Road at Onassa Circle

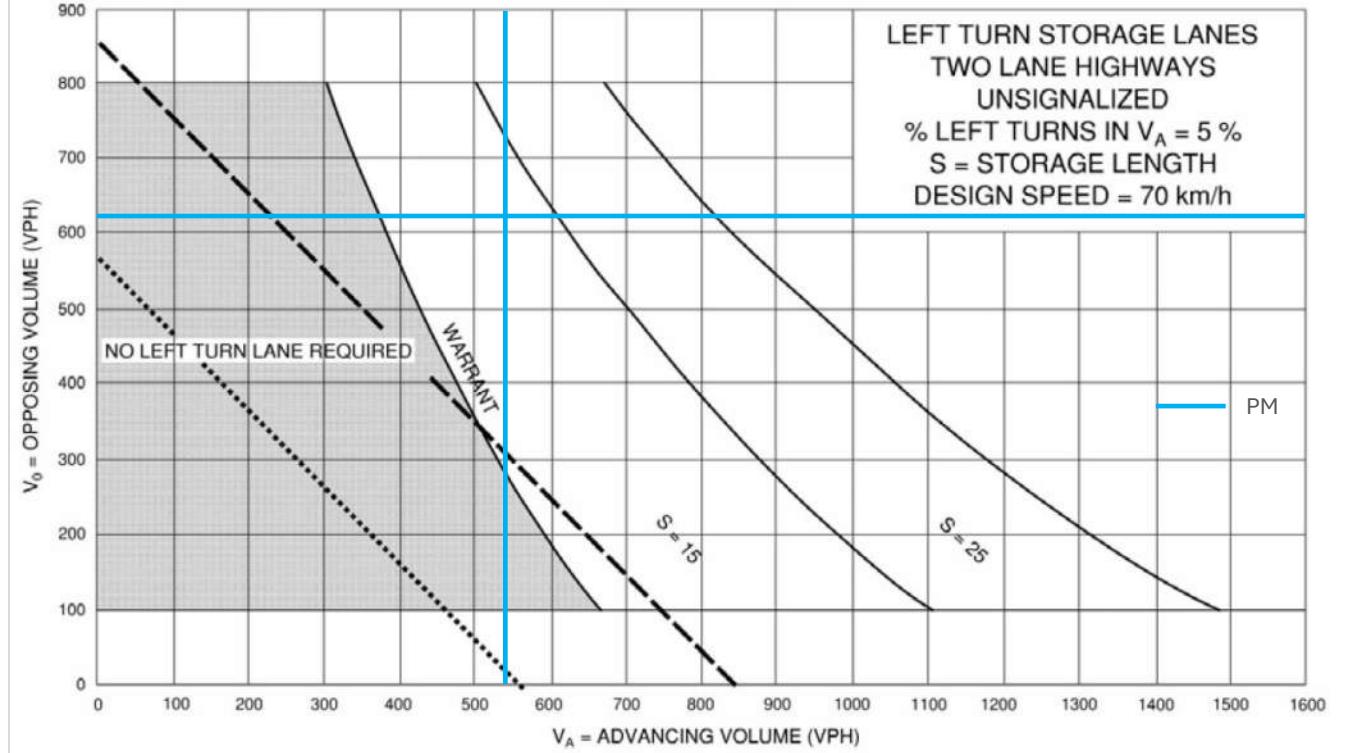
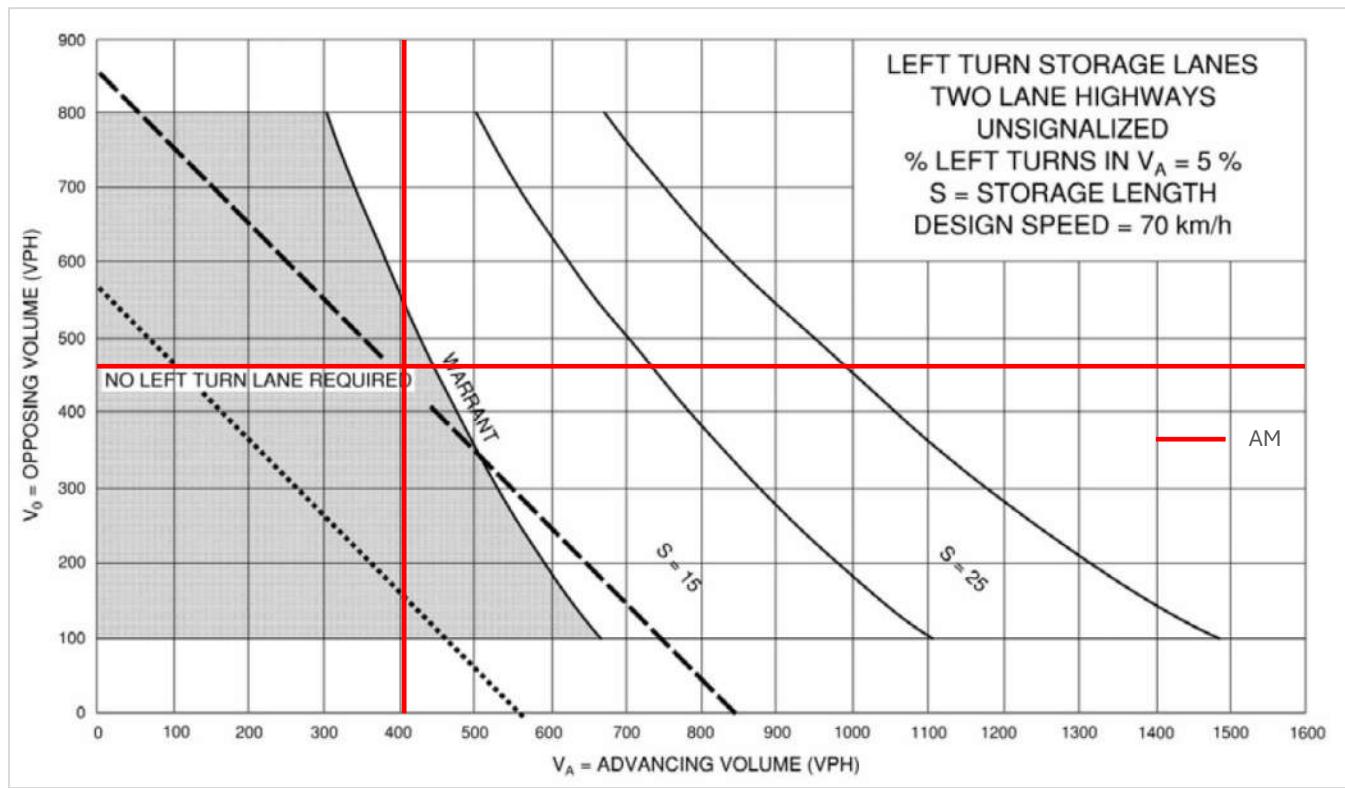
Existing – Northbound Left



FB2038 – Northbound Left



FT2038 – Northbound Left



Appendix K

Synchro Intersection Worksheets –Future Background 2038 Mitigation Measures

Lanes, Volumes, Timings
3: Cobble Hill/O'Keefe & Fallowfield

2028 Future Background AM Peak Hour
4497 O'Keefe Court

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	92	597	11	15	593	11	34	2	52	32	4	18
Future Volume (vph)	92	597	11	15	593	11	34	2	52	32	4	18
Satl. Flow (prot)	1523	1712	1388	1580	1695	1327	0	1538	0	1271	1372	0
Flt Permitted	0.386		0.383				0.864		0.700			
Satl. Flow (perm)	619	1712	1388	637	1695	1327	0	1355	0	935	1372	0
Satl. Flow (RTOR)			35			35		52			18	
Lane Group Flow (vph)	92	597	11	15	593	11	0	88	0	32	22	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2				6			8			4
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	38.2	38.2	38.2	38.2	38.2	38.2	30.9	30.9	30.9	30.9	30.9	
Total Split (s)	59.0	59.0	59.0	59.0	59.0	59.0	31.0	31.0	31.0	31.0	31.0	
Total Split (%)	65.6%	65.6%	65.6%	65.6%	65.6%	65.6%	34.4%	34.4%	34.4%	34.4%	34.4%	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7	3.7	
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9	2.9	2.2	2.2	2.2	2.2	2.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.2	6.2	6.2	6.2	6.2	6.2	5.9	5.9	5.9	5.9	5.9	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None											
Act Effct Green (s)	28.6	28.6	28.6	28.6	28.6	28.6	15.1	15.1	15.1	15.1	15.1	
Actuated g/C Ratio	0.70	0.70	0.70	0.70	0.70	0.70	0.37	0.37	0.37	0.37	0.37	
v/c Ratio	0.21	0.50	0.01	0.03	0.50	0.01	0.17	0.09	0.09	0.04		
Control Delay	9.4	10.2	0.5	7.8	10.3	0.5	9.9	17.0	9.9			
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	9.4	10.2	0.5	7.8	10.3	0.5	9.9	17.0	9.9			
LOS	A	B	A	A	B	A	A		B	A		
Approach Delay		10.0			10.1		9.9		14.1			
Approach LOS		A			B		A		B			
Queue Length 50th (m)	3.7	31.2	0.0	0.5	31.0	0.0	2.0	1.8	0.3			
Queue Length 95th (m)	16.5	94.4	0.5	3.7	94.5	0.5	13.5	9.6	5.2			
Internal Link Dist (m)		356.4			561.2		133.0		776.8			
Turn Bay Length (m)	147.5			60.0		30.5		42.5				
Base Capacity (vph)	578	1599	1298	595	1583	1241	959	650	960			
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.16	0.37	0.01	0.03	0.37	0.01	0.09	0.05	0.02			

Lanes, Volumes, Timings
3: Cobble Hill/O'Keefe & Fallowfield

2028 Future Background AM Peak Hour
4497 O'Keefe Court

Intersection Signal Delay: 10.2	Intersection LOS: B
Intersection Capacity Utilization 69.2%	ICU Level of Service C
Analysis Period (min) 15	
Splits and Phases: 3: Cobble Hill/O'Keefe & Fallowfield	
Ø2	Ø4
59 s	31 s
Ø6	Ø8
59 s	31 s

Lanes, Volumes, Timings
3: Cobble Hill/O'Keefe & Fallowfield

2038 Future BackgroundPM Peak Hour
4497 O'Keefe Court

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	→	↑	←	↑	←	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	77	594	66	52	706	22	23	3	44	48	5	18
Future Volume (vph)	77	594	66	52	706	22	23	3	44	48	5	18
Satl. Flow (prot)	1523	1728	1483	1658	1695	1483	0	1444	0	1658	1421	0
Flt Permitted	0.315			0.395				0.881		0.711		
Satl. Flow (perm)	505	1728	1450	689	1695	1483	0	1293	0	1236	1421	0
Satl. Flow (RTOR)			66			26		44			18	
Lane Group Flow (vph)	77	594	66	52	706	22	0	70	0	48	23	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8					
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	38.2	38.2	38.2	60.5	60.5	60.5	30.9	30.9	30.9	30.9	30.9	
Total Split (s)	88.0	88.0	88.0	88.0	88.0	88.0	32.0	32.0	32.0	32.0	32.0	
Total Split (%)	73.3%	73.3%	73.3%	73.3%	73.3%	73.3%	26.7%	26.7%	26.7%	26.7%	26.7%	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7	3.7	
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9	2.9	2.2	2.2	2.2	2.2	2.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.2	6.2	6.2	6.2	6.2	6.2	5.9	5.9	5.9	5.9	5.9	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None											
Act Efft Green (s)	33.3	33.3	33.3	33.3	33.3	33.3	15.4	15.4	15.4	15.4	15.4	
Actuated g/C Ratio	0.73	0.73	0.73	0.73	0.73	0.73	0.34	0.34	0.34	0.34	0.34	
v/c Ratio	0.21	0.47	0.06	0.10	0.57	0.02	0.15	0.11	0.05			
Control Delay	8.9	8.9	2.3	7.2	10.7	2.9	11.6	19.9	12.1			
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	8.9	8.9	2.3	7.2	10.7	2.9	11.6	19.9	12.1			
LOS	A	A	A	A	B	A	B	B	B	B	B	
Approach Delay		8.3			10.2		11.6		17.4			
Approach LOS		A			B		B		B			
Queue Length 50th (m)	3.1	30.8	0.0	1.9	41.2	0.0	1.7	3.2	0.3			
Queue Length 95th (m)	14.3	90.2	4.8	9.1	122.4	2.6	12.9	14.5	6.1			
Internal Link Dist (m)		356.4			561.2		133.0	776.8				
Turn Bay Length (m)	147.5		60.0		30.5		42.5					
Base Capacity (vph)	497	1701	1429	678	1669	1461	887	834	965			
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.15	0.35	0.05	0.08	0.42	0.02	0.08	0.06	0.02			

Lanes, Volumes, Timings
3: Cobble Hill/O'Keefe & Fallowfield

2038 Future BackgroundPM Peak Hour
4497 O'Keefe Court

Intersection Signal Delay: 9.7	Intersection LOS: A
Intersection Capacity Utilization 74.6%	ICU Level of Service D
Analysis Period (min) 15	
Splits and Phases: 3: Cobble Hill/O'Keefe & Fallowfield	

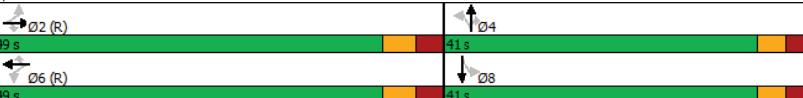
Lanes, Volumes, Timings
4: Cedarview & Fallowfield

2038 Future BackgroundPM Peak Hour
4497 O'Keefe Court

Lane Group													
Lane Group		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	25	538	30	148	756	83	21	185	131	287	597	46	
Future Volume (vph)	25	538	30	148	756	83	21	185	131	287	597	46	
Satd. Flow (prot)	1658	1745	1483	1642	1728	1483	1537	1728	1469	1658	1724	0	
Flt Permitted	0.129						0.123				0.641		
Satd. Flow (perm)	225	1745	1483	543	1728	1451	199	1728	1469	1119	1724	0	
Satd. Flow (RTOR)			46			68			131		5		
Lane Group Flow (vph)	25	538	30	148	756	83	21	185	131	287	643	0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		
Protected Phases	2				6			4			8		
Permitted Phases	2		2	6	6	6	4	4	4	8	8		
Detector Phase	2	2	2	6	6	6	4	4	4	8	8		
Switch Phase													
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		
Minimum Split (s)	48.0	48.0	48.0	48.0	48.0	48.0	37.0	37.0	37.0	37.0	37.0		
Total Split (s)	49.0	49.0	49.0	49.0	49.0	49.0	41.0	41.0	41.0	41.0	41.0		
Total Split (%)	54.4%	54.4%	54.4%	54.4%	54.4%	54.4%	45.6%	45.6%	45.6%	45.6%	45.6%		
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.0	3.0	3.0	3.0		
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.8	3.8	3.8	3.8	3.8		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8	6.8	6.8	6.8		
Lead/Lag													
Lead-Lag Optimize?													
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None		
Act Effct Green (s)	42.3	42.3	42.3	42.3	42.3	42.3	34.2	34.2	34.2	34.2	34.2		
Actuated g/C Ratio	0.47	0.47	0.47	0.47	0.47	0.47	0.38	0.38	0.38	0.38	0.38		
v/c Ratio	0.24	0.66	0.04	0.58	0.93	0.12	0.28	0.28	0.21	0.68	0.98		
Control Delay	21.5	23.0	2.5	28.6	42.8	5.1	31.3	20.9	4.4	32.8	59.1		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	21.5	23.0	2.5	28.6	42.8	5.1	31.3	20.9	4.4	32.8	59.1		
LOS	C	C	A	C	D	A	C	C	A	C	E		
Approach Delay		21.9			37.5			15.1			50.9		
Approach LOS		C			D		B				D		
Queue Length 50th (m)	2.5	68.6	0.0	17.9	118.4	1.3	2.5	21.8	0.0	40.6	107.0		
Queue Length 95th (m)	8.8	103.2	2.9	40.2	#193.3	8.6	9.5	37.3	10.6	69.9	#177.6		
Internal Link Dist (m)		561.2			452.7			444.3			482.1		
Turn Bay Length (m)	60.0		55.0	60.0		55.0	180.0		80.0		45.5		
Base Capacity (vph)	105	820	721	255	812	718	75	656	639	425	658		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0		
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0		
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0		
Reduced v/c Ratio	0.24	0.66	0.04	0.58	0.93	0.12	0.28	0.28	0.21	0.68	0.98		
Intersection Summary													
Cycle Length: 90													
Actuated Cycle Length: 90													
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green													
Natural Cycle: 85													
Control Type: Actuated-Coordinated													

Lanes, Volumes, Timings
4: Cedarview & Fallowfield

2038 Future BackgroundPM Peak Hour
4497 O'Keefe Court

Maximum v/c Ratio: 0.98	Intersection Signal Delay: 36.0	Intersection LOS: D
Intersection Capacity Utilization 117.3%	ICU Level of Service H	
Analysis Period (min) 15		
# 95th percentile volume exceeds capacity, queue may be longer.		
Queue shown is maximum after two cycles.		
Splits and Phases: 4: Cedarview & Fallowfield		
		

Appendix L

Synchro Intersection Worksheets – 2038 Future Total Conditions

Intersection							
Int Delay, s/veh	2.8						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	W				U	R	
Traffic Vol, veh/h	73	48	30	383	430	41	
Future Vol, veh/h	73	48	30	383	430	41	
Conflicting Peds, #/hr	0	0	26	0	0	26	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	0	-	-	-	-	-	
Veh in Median Storage, #	0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	100	100	100	100	100	100	
Heavy Vehicles, %	14	2	11	2	2	17	
Mvmt Flow	73	48	30	383	430	41	
Major/Minor	Minor2	Major1	Major2				
Conflicting Flow All	920	477	497	0	-	0	
Stage 1	477	-	-	-	-	-	
Stage 2	443	-	-	-	-	-	
Critical Hdwy	6.54	6.22	4.21	-	-	-	
Critical Hdwy Stg 1	5.54	-	-	-	-	-	
Critical Hdwy Stg 2	5.54	-	-	-	-	-	
Follow-up Hdwy	3.626	3.318	2.299	-	-	-	
Pot Cap-1 Maneuver	286	588	1022	-	-	-	
Stage 1	600	-	-	-	-	-	
Stage 2	622	-	-	-	-	-	
Platoon blocked, %	-	-	-	-	-	-	
Mov Cap-1 Maneuver	264	576	1001	-	-	-	
Mov Cap-2 Maneuver	264	-	-	-	-	-	
Stage 1	566	-	-	-	-	-	
Stage 2	610	-	-	-	-	-	
Approach	EB	NB	SB				
HCM Control Delay, s	21.6	0.6	0				
HCM LOS	C						
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR		
Capacity (veh/h)	1001	-	336	-	-		
HCM Lane V/C Ratio	0.03	-	0.36	-	-		
HCM Control Delay (s)	8.7	0	21.6	-	-		
HCM Lane LOS	A	A	C	-	-		
HCM 95th %tile Q(veh)	0.1	-	1.6	-	-		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	W	U		W	U		W	U		W	U	
Traffic Volume (vph)	496	1201	249	38	1775	96	66	48	10	87	153	479
Future Volume (vph)	496	1201	249	38	1775	96	66	48	10	87	153	479
Satd. Flow (prot)	3066	3103	1401	1353	3221	1483	2929	1408	0	1658	1664	1469
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3031	3103	1323	1343	3221	1347	2875	1408	0	1623	1664	1394
Satd. Flow (RTOR)			240			225		9				371
Lane Group Flow (vph)	496	1201	249	38	1775	96	66	58	0	87	153	479
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	
Protected Phases	13	2		9	6		7	4	3	8		8
Permitted Phases						6						
Detector Phase	13	2	2	9	6	6	7	4	3	8		8
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0	10.0
Minimum Split (s)	12.1	29.9	29.9	12.1	29.9	29.9	11.5	48.0	11.5	48.0	48.0	
Total Split (s)	28.0	46.0	46.0	13.0	31.0	31.0	13.0	48.0	13.0	48.0	48.0	
Total Split (%)	23.3%	38.3%	38.3%	10.8%	25.8%	25.8%	10.8%	40.0%	10.8%	40.0%	40.0%	
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	3.7	3.7	3.7	3.7	3.7	3.7
All-Red Time (s)	2.5	2.3	2.3	2.5	2.3	2.3	2.8	3.3	2.8	3.3	3.3	3.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.1	6.9	6.9	7.1	6.9	6.9	6.5	7.0	6.5	7.0	7.0	
Lead/Lag							Lag	Lead	Lag	Lead	Lead	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	21.5	55.0	55.0	6.2	37.2	37.2	6.9	28.6	8.7	29.5	29.5	
Actuated g/C Ratio	0.18	0.46	0.46	0.05	0.31	0.31	0.06	0.24	0.07	0.25	0.25	
v/c Ratio	0.91	0.84	0.34	0.55	1.78	0.17	0.40	0.17	0.73	0.38	0.77	
Control Delay	69.8	40.4	5.6	84.1	382.3	0.6	61.9	27.0	88.3	37.3	17.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.8	40.4	5.6	84.1	382.3	0.6	61.9	27.0	88.3	37.3	17.2	
LOS	E	D	A	F	F	A	E	C	F	D	B	
Approach Delay		43.4			357.2			45.6		30.1		
Approach LOS		D			F			D		C		
Queue Length 50th (m)	60.0	~179.3	1.5	8.9	~374.3	0.0	7.9	7.8	20.8	26.0	18.3	
Queue Length 95th (m)	#90.9	#220.8	20.1	#25.4	#416.8	0.0	15.2	17.5	#53.5	42.8	56.5	
Internal Link Dist (m)		441.7			233.3				132.8		356.4	
Turn Bay Length (m)	127.0		96.5	95.0		90.0	90.0			140.0		125.0
Base Capacity (vph)	549	1422	736	70	997	572	170	486	119	568		720
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.84	0.34	0.54	1.78	0.17	0.39	0.12	0.73	0.27	0.67	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 101 (84%), Referenced to phase 2:EBT and 6:WBT, Start of Green												
Natural Cycle: 145												
Control Type: Actuated-Coordinated												

Lanes, Volumes, Timings 2: Citigate & Fallowfield & Strandherd

2038 Future TotalAM Peak Hour 4497 O'Keefe Court

Maximum v/c Ratio: 1.78

Intersection Signal Delay: 168.9

Intersection Capacity Utilization 116.6%

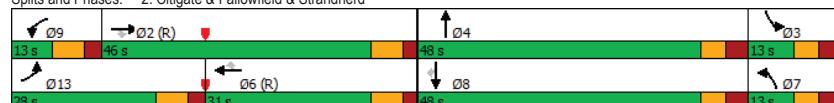
Analysis Period (min) 15

- ~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue

Splits and Phases: 2: Citigate & Fallowfield & Strandherd



HCM 2010 TWSC
3: Cobble Hill/O'Keefe & Fallowfield

2038 Future TotalAM Peak Hour 4497 O'Keefe Court

Intersection

Intersection

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↔	↔	↑	↑	↑	↑
Traffic Vol, veh/h	135	601	11	15	604	63	34	2	52	136	4	106
Future Vol, veh/h	135	601	11	15	604	63	34	2	52	136	4	106
Conflicting Peds, #/hr	26	0	26	26	0	26	26	0	14	14	0	26
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	147.5	-	0	-	-	30.5	-	-	-	42.5	-	-
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, %	11	4	9	7	5	14	2	50	2	33	67	2
Mvmt Flow	135	601	11	15	604	63	34	2	52	136	4	106

Major/Minor	Major1		Major2		Minor1		Minor2						
Conflicting Flow All	693		0	0	638	0	0	1644	1620	641	1578	1568	656
Stage 1	-	-	-	-	-	-	897	897	-	660	660	-	
Stage 2	-	-	-	-	-	-	747	723	-	918	908	-	
Critical Hdwy	4.21	-	-	4.17	-	-	7.12	7	6.22	7.43	7.17	6.22	
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	6	-	6.43	6.17	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	6	-	6.43	6.17	-	
Follow-up Hdwy	2.299	-	-	2.263	-	-	3.518	4.45	3.318	3.797	4.603	3.318	
Pot Cap-1 Maneuver	862	-	-	922	-	-	80	80	475	~75	80	465	
Stage 1	-	-	-	-	-	-	334	300	-	405	374	-	
Stage 2	-	-	-	-	-	-	405	367	-	287	279	-	
Platoon blocked, %	-	-	-	-	-	-							
Mov Cap-1 Maneuver	845	-	-	903	-	-	48	63	460	~55	63	446	
Mov Cap-2 Maneuver	-	-	-	-	-	-	48	63	-	~55	63	-	
Stage 1	-	-	-	-	-	-	275	247	-	333	360	-	
Stage 2	-	-	-	-	-	-	294	353	-	210	230	-	
Approach	EB	WB	NB	NB	SB	SB	EB	WB	NB	NB	SB		
HGM Control Delay	1.8	0.8	1.8	1.8	1.8	1.8	1.8	0.8	1.8	1.8	1.8		

HCM LOS									
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBC	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	103	845	-	-	903	-	-	55	365
HCM Lane V/C Ratio	0.854	0.16	-	-	0.017	-	-	2.473	0.301
HCM Control Delay (s)	127.6	10.1	-	-	9.1	-	-	\$ 829.2	19.1
HCM Lane LOS	F	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	4.9	0.6	-	-	0.1	-	-	13.8	1.2

Notes

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

Lanes, Volumes, Timings
4: Cedarview & Fallowfield

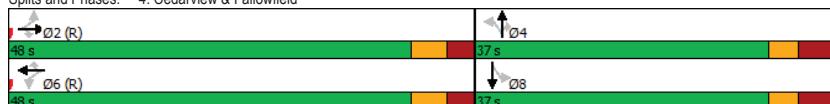
2038 Future TotalAM Peak Hour
4497 O'Keefe Court

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	887	11	32	603	194	51	357	278	231	128	26
Future Volume (vph)	54	887	11	32	603	194	51	357	278	231	128	26
Satl. Flow (prot)	1658	1712	1261	1537	1728	1483	1658	1745	1469	1642	1640	0
Flt Permitted	0.287		0.094			0.659			0.413			
Satl. Flow (perm)	495	1712	1209	152	1728	1396	1135	1745	1402	704	1640	0
Satl. Flow (RTOR)			49			194			89		13	
Lane Group Flow (vph)	54	887	11	32	603	194	51	357	278	231	154	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2			6		4		4	8		8
Permitted Phases	2		2	6	6	6	4	4	4	8		8
Detector Phase	2	2	2	6	6	6	4	4	4	8		8
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	48.0	48.0	48.0	48.0	48.0	48.0	37.0	37.0	37.0	37.0	37.0	37.0
Total Split (s)	48.0	48.0	48.0	48.0	48.0	48.0	37.0	37.0	37.0	37.0	37.0	37.0
Total Split (%)	56.5%	56.5%	56.5%	56.5%	56.5%	43.5%	43.5%	43.5%	43.5%	43.5%	43.5%	43.5%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.8	3.8	3.8	3.8	3.8	3.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8	6.8	6.8	6.8	6.8
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None	None
Act Efect Green (s)	42.7	42.7	42.7	42.7	42.7	42.7	28.8	28.8	28.8	28.8	28.8	28.8
Actuated g/C Ratio	0.50	0.50	0.50	0.50	0.50	0.50	0.34	0.34	0.34	0.34	0.34	0.34
v/c Ratio	0.22	1.03	0.02	0.42	0.70	0.24	0.13	0.60	0.52	0.97	0.27	
Control Delay	15.6	63.5	0.1	35.9	22.1	2.8	19.7	28.0	18.5	81.3	19.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	15.6	63.5	0.1	35.9	22.1	2.8	19.7	28.0	18.5	81.3	19.6	
LOS	B	E	A	D	C	A	B	C	B	F	B	
Approach Delay		60.0			18.1			23.5			56.6	
Approach LOS		E			B		C				E	
Queue Length 50th (m)	4.8	~161.2	0.0	3.2	73.8	0.0	5.5	46.3	22.9	35.4	15.9	
Queue Length 95th (m)	12.6	#229.0	0.0	#16.1	112.9	10.0	13.1	72.8	45.2	#78.7	29.8	
Internal Link Dist (m)		561.2			452.7			444.3			482.1	
Turn Bay Length (m)	60.0		55.0	60.0		55.0	180.0		80.0		45.5	
Base Capacity (vph)	248	859	631	76	867	797	403	619	555	250	591	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.22	1.03	0.02	0.42	0.70	0.24	0.13	0.58	0.50	0.92	0.26	
Intersection Summary												
Cycle Length: 85												
Actuated Cycle Length: 85												
Offset: 40 (47%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 95												
Control Type: Actuated-Coordinated												

Lanes, Volumes, Timings
4: Cedarview & Fallowfield

2038 Future TotalAM Peak Hour
4497 O'Keefe Court

Maximum v/c Ratio: 1.03	Intersection Signal Delay: 38.6	Intersection LOS: D
	Intersection Capacity Utilization 99.5%	ICU Level of Service F
Analysis Period (min) 15		
~ Volume exceeds capacity, queue is theoretically infinite.		
Queue shown is maximum after two cycles.		
# 95th percentile volume exceeds capacity, queue may be longer.		
Queue shown is maximum after two cycles.		
Splits and Phases: 4: Cedarview & Fallowfield		



Intersection							
Int Delay, s/veh	3.1						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	Y		Y		Y		
Traffic Vol, veh/h	60	46	47	502	570	70	
Future Vol, veh/h	60	46	47	502	570	70	
Conflicting Peds, #/hr	0	0	32	0	0	32	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	0	-	-	-	-	-	
Veh in Median Storage, #	0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	100	100	100	100	100	100	
Heavy Vehicles, %	8	7	2	2	2	2	
Mvmt Flow	60	46	47	502	570	70	
Major/Minor	Minor2	Major1	Major2				
Conflicting Flow All	1233	637	672	0	-	0	
Stage 1	637	-	-	-	-	-	
Stage 2	596	-	-	-	-	-	
Critical Hdwy	6.48	6.27	4.12	-	-	-	
Critical Hdwy Stg 1	5.48	-	-	-	-	-	
Critical Hdwy Stg 2	5.48	-	-	-	-	-	
Follow-up Hdwy	3.572	3.363	2.218	-	-	-	
Pot Cap-1 Maneuver	190	468	919	-	-	-	
Stage 1	516	-	-	-	-	-	
Stage 2	539	-	-	-	-	-	
Platoon blocked, %	-	-	-	-	-	-	
Mov Cap-1 Maneuver	167	456	896	-	-	-	
Mov Cap-2 Maneuver	167	-	-	-	-	-	
Stage 1	466	-	-	-	-	-	
Stage 2	526	-	-	-	-	-	
Approach	EB	NB	SB				
HCM Control Delay, s	33.4	0.8	0				
HCM LOS	D						
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR		
Capacity (veh/h)	896	-	230	-	-		
HCM Lane V/C Ratio	0.052	-	0.461	-	-		
HCM Control Delay (s)	9.2	0	33.4	-	-		
HCM Lane LOS	A	A	D	-	-		
HCM 95th %tile Q(veh)	0.2	-	2.2	-	-		

2038 Future TotalPM Peak Hour												
4497 O'Keefe Court												
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	Y	Y		Y	Y		Y	Y		Y	Y	
Traffic Volume (vph)	461	1655	208	10	1873	144	371	196	43	145	110	536
Future Volume (vph)	461	1655	208	10	1873	144	371	196	43	145	110	536
Satd. Flow (prot)	3216	3316	1469	1127	3316	1483	3154	1635	0	1658	1664	1455
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3176	3316	1372	1122	3316	1315	3078	1635	0	1624	1664	1383
Satd. Flow (RTOR)			160			160			10			358
Lane Group Flow (vph)	461	1655	208	10	1873	144	371	239	0	145	110	536
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA	Perm	
Protected Phases	13	2		9	6		7	4	3	8		8
Permitted Phases				2			6					
Detector Phase	13	2	2	9	6	6	7	4	3	8	8	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	10.0	
Minimum Split (s)	12.1	29.9	29.9	12.1	29.9	29.9	11.5	48.0	11.5	48.0	48.0	
Total Split (s)	24.0	34.0	34.0	24.0	34.0	34.0	14.0	48.0	14.0	48.0	48.0	
Total Split (%)	20.0%	28.3%	28.3%	20.0%	28.3%	28.3%	11.7%	40.0%	11.7%	40.0%	40.0%	
Yellow Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	3.7	3.7	3.7	3.7	3.7	
All-Red Time (s)	2.5	2.3	2.3	2.5	2.3	2.3	2.8	3.3	2.8	3.3	3.3	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	7.1	6.9	6.9	7.1	6.9	6.9	6.5	7.0	6.5	7.0	7.0	
Lead/Lag							Lag	Lead	Lag	Lead	Lead	
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
Act Effct Green (s)	16.9	47.9	47.9	6.8	27.1	27.1	18.2	31.3	17.2	30.3	30.3	
Actuated g/C Ratio	0.14	0.40	0.40	0.06	0.23	0.23	0.15	0.26	0.14	0.25	0.25	
v/c Ratio	1.02	1.25	0.32	0.16	2.50	0.34	0.78	0.55	0.61	0.26	0.87	
Control Delay	98.3	151.3	9.1	58.8	702.6	6.8	62.8	39.7	63.7	34.0	27.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	98.3	151.3	9.1	58.8	702.6	6.8	62.8	39.7	63.7	34.0	27.8	
LOS	F	F	A	E	F	A	E	D	E	C	C	
Approach Delay					650.0		53.7			35.3		
Approach LOS					F		D					
Queue Length 50th (m)	~58.0	~244.7	6.6	2.3	~386.4	0.0	~68.8	41.2	~45.7	18.2	37.4	
Queue Length 95th (m)	#91.5	#343.9	28.2	7.8	#428.7	13.0	#99.1	64.1	#86.3	31.9	85.0	
Internal Link Dist (m)		441.7			233.3				132.8		356.4	
Turn Bay Length (m)	127.0		96.5	95.0		90.0	90.0			140.0	125.0	
Base Capacity (vph)	452	1324	644	158	748	420	478	565	237	568	708	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	1.02	1.25	0.32	0.06	2.50	0.34	0.78	0.42	0.61	0.19	0.76	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green												
Natural Cycle: 145												
Control Type: Actuated-Coordinated												

Lanes, Volumes, Timings
2: Citigate & Fallowfield & Strandherd

Maximum v/c Ratio: 2.50

Intersection Signal Delay: 291.3

Intersection LOS: F

Intersection Capacity Utilization 127.9%

ICU Level of Service H

Analysis Period (min) 15

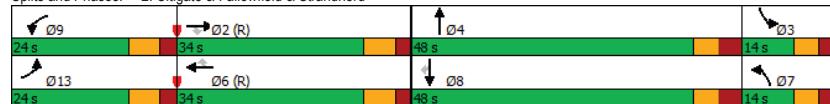
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 2: Citigate & Fallowfield & Strandherd



2038 Future TotalPM Peak Hour
4497 O'Keefe Court

HCM 2010 TWSC
3: Cobble Hill/O'Keefe & Fallowfield

2038 Future TotalPM Peak Hour
4497 O'Keefe Court

Intersection

Int Delay, s/veh 106.9

Movement	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↑	↑	↑	↑	↑	↑	↔	↑	↑	↑	↔	
Traffic Vol, veh/h	168	602	66	52	709	130	23	3	44	133	5	88
Future Vol, veh/h	168	602	66	52	709	130	23	3	44	133	5	88
Conflicting Peds, #/hr	32	0	33	33	0	32	32	0	18	18	0	32
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	-	-	-	-	-	-	-	-	None
Storage Length	147.5	-	0	-	-	30.5	-	-	-	42.5	-	-
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, %	11	3	2	2	5	2	24	2	2	2	2	13
Mvmt Flow	168	602	66	52	709	130	23	3	44	133	5	88

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	871	0	0	701
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.21	-	4.12	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.299	-	2.218	-
Pot Cap-1 Maneuver	737	-	896	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	719	-	873	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.3	0.5	283.9	\$ 858.9
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	60	719	-	-	873	-	-	36	270
HCM Lane V/C Ratio	1.167	0.234	-	-	0.06	-	-	3.694	0.344
HCM Control Delay (s)	283.9	11.5	-	-	9.4	-	\$ 1441.9	25.2	
HCM Lane LOS	F	B	-	-	A	-	-	F	D
HCM 95th %tile Q(veh)	5.8	0.9	-	-	0.2	-	-	15.4	1.5

Notes

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

Lanes, Volumes, Timings
4: Cedarview & Fallowfield

2038 Future TotalPM Peak Hour
4497 O'Keefe Court

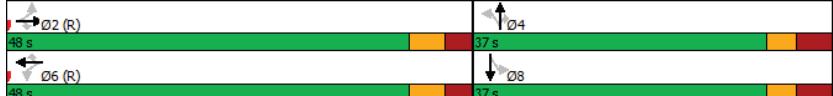
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	613	33	148	854	111	24	182	131	306	594	56
Future Volume (vph)	39	613	33	148	854	111	24	182	131	306	594	56
Satl. Flow (prot)	1658	1745	1483	1642	1728	1483	1537	1728	1469	1658	1718	0
Flt Permitted	0.097						0.132			0.643		
Satl. Flow (perm)	169	1745	1418	456	1728	1381	214	1728	1393	1094	1718	0
Satl. Flow (RTOR)			49			88			131		6	
Lane Group Flow (vph)	39	613	33	148	854	111	24	182	131	306	650	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		2				6			4		8	
Permitted Phases	2		2	6		6	4		4	8		
Detector Phase	2	2	2	6	6	6	4	4	4	8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	48.0	48.0	48.0	48.0	48.0	48.0	37.0	37.0	37.0	37.0	37.0	
Total Split (s)	48.0	48.0	48.0	48.0	48.0	48.0	37.0	37.0	37.0	37.0	37.0	
Total Split (%)	56.5%	56.5%	56.5%	56.5%	56.5%	43.5%	43.5%	43.5%	43.5%	43.5%	43.5%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.8	3.8	3.8	3.8	3.8	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.8	6.8	6.8	6.8	6.8	6.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None	
Act Efect Green (s)	41.3	41.3	41.3	41.3	41.3	41.3	30.2	30.2	30.2	30.2	30.2	
Actuated g/C Ratio	0.49	0.49	0.49	0.49	0.49	0.49	0.36	0.36	0.36	0.36	0.36	
v/c Ratio	0.48	0.72	0.05	0.67	1.02	0.16	0.32	0.30	0.23	0.79	1.06	
Control Delay	38.5	23.4	2.4	34.9	59.5	4.6	33.5	21.4	4.8	41.5	81.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	38.5	23.4	2.4	34.9	59.5	4.6	33.5	21.4	4.8	41.5	81.6	
LOS	D	C	A	C	E	A	C	C	A	D	F	
Approach Delay		23.3			50.8			15.8			68.8	
Approach LOS		C			D			B			E	
Queue Length 50th (m)	4.0	75.3	0.0	17.5	~139.1	1.9	2.8	21.0	0.0	43.8	~117.0	
Queue Length 95th (m)	#18.5	115.0	2.9	#47.7	#215.7	9.9	10.3	36.3	10.9	#85.4	#180.4	
Internal Link Dist (m)		561.2			452.7			444.3			482.1	
Turn Bay Length (m)	60.0		55.0	60.0		55.0	180.0		80.0		45.5	
Base Capacity (vph)	82	847	714	221	839	716	76	613	579	388	614	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.48	0.72	0.05	0.67	1.02	0.16	0.32	0.30	0.23	0.79	1.06	
Intersection Summary												
Cycle Length: 85												
Actuated Cycle Length: 85												
Offset: 40 (47%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 95												
Control Type: Actuated-Coordinated												

Lanes, Volumes, Timings
4: Cedarview & Fallowfield

2038 Future TotalPM Peak Hour
4497 O'Keefe Court

Maximum v/c Ratio: 1.06	Intersection Signal Delay: 46.4	Intersection LOS: D
	Intersection Capacity Utilization 123.3%	ICU Level of Service H
Analysis Period (min) 15		
~ Volume exceeds capacity, queue is theoretically infinite.		
Queue shown is maximum after two cycles.		
# 95th percentile volume exceeds capacity, queue may be longer.		
Queue shown is maximum after two cycles.		

Splits and Phases: 4: Cedarview & Fallowfield



Appendix M

Synchro Intersection Worksheets –Future Total 2038 Mitigation Measures

Lanes, Volumes, Timings
3: Cobble Hill/O'Keefe & Fallowfield

2038 Future Total AM Peak Hour
4497 O'Keefe Court

Lane Group	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	601	11	15	604	63	34	2	52	136	4	106
Future Volume (vph)	135	601	11	15	604	63	34	2	52	136	4	106
Satd. Flow (prot)	1523	1712	1388	1580	1695	1327	0	1510	0	1271	1344	0
Flt Permitted	0.376							0.850			0.705	
Satd. Flow (perm)	594	1712	1294	619	1695	1237	0	1281	0	916	1344	0
Satd. Flow (RTOR)			26			38		52			106	
Lane Group Flow (vph)	135	601	11	15	604	63	0	88	0	136	110	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2				6			8			4
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	38.2	38.2	38.2	38.2	38.2	38.2	30.9	30.9		30.9	30.9	
Total Split (s)	77.0	77.0	77.0	77.0	77.0	77.0	43.0	43.0		43.0	43.0	
Total Split (%)	64.2%	64.2%	64.2%	64.2%	64.2%	64.2%	35.8%	35.8%		35.8%	35.8%	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.7	3.7		3.7	3.7	
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9	2.9	2.2	2.2		2.2	2.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.2	6.2	6.2	6.2	6.2	6.2	5.9	5.9		5.9	5.9	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	None								
Act Efect Green (s)	84.7	84.7	84.7	84.7	84.7	84.7	23.2	23.2	23.2	23.2	23.2	
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.71	0.71	0.19	0.19	0.19	0.19	0.19	
v/c Ratio	0.32	0.50	0.01	0.03	0.51	0.07	0.30	0.77	0.77	0.77	0.77	
Control Delay	7.4	11.1	0.1	16.6	23.5	12.0	20.1	71.6	9.7			
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	7.4	11.1	0.1	16.6	23.5	12.0	20.1	71.6	9.7			
LOS	A	B	A	B	C	B	C	E	A			
Approach Delay		10.3			22.3		20.1		43.9			
Approach LOS		B			C		C		D			
Queue Length 50th (m)	4.4	40.9	0.0	2.0	105.1	5.8	7.0	30.0	0.8			
Queue Length 95th (m)	m7.0	m52.9	m0.0	m4.0	154.5	m12.9	19.5	48.5	14.2			
Internal Link Dist (m)		356.4			561.2		133.0		776.8			
Turn Bay Length (m)	147.5			60.0		30.5		42.5				
Base Capacity (vph)	419	1208	920	436	1196	884	431	283	488			
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	0.32	0.50	0.01	0.03	0.51	0.07	0.20	0.48	0.23			
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 104 (87%), Referenced to phase 2:EBTL, Start of Green												
Natural Cycle: 70												
Control Type: Actuated-Coordinated												

Lanes, Volumes, Timings
3: Cobble Hill/O'Keefe & Fallowfield

2038 Future Total AM Peak Hour
4497 O'Keefe Court

Maximum v/c Ratio: 0.77	Intersection Signal Delay: 20.1	Intersection LOS: C
Intersection Capacity Utilization 75.4%		ICU Level of Service D
Analysis Period (min) 15		
m Volume for 95th percentile queue is metered by upstream signal.		
Splits and Phases: 3: Cobble Hill/O'Keefe & Fallowfield		

Lanes, Volumes, Timings
4: Cedarview & Fallowfield

2038 Future TotalAM Peak Hour
4497 O'Keefe Court

Lane Group													
Lane Group		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (vph)	54	887	11	32	603	194	51	357	278	231	128	26	
Future Volume (vph)	54	887	11	32	603	194	51	357	278	231	128	26	
Satl. Flow (prot)	1658	1712	1261	1537	1728	1483	1658	1745	1469	1642	1638	0	
Flt Permitted	0.289						0.652			0.389			
Satl. Flow (perm)	497	1712	1199	136	1728	1373	1118	1745	1386	661	1638	0	
Satl. Flow (RTOR)			35			168			110		10		
Lane Group Flow (vph)	54	887	11	32	603	194	51	357	278	231	154	0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		
Protected Phases		2			6			4		4	8		
Permitted Phases	2		2	6	6	6	4	4	4	4	8	8	
Detector Phase	2	2	2	6	6	6	4	4	4	4	8	8	
Switch Phase													
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	48.0	48.0	48.0	48.0	48.0	48.0	37.0	37.0	37.0	37.0	37.0	37.0	
Total Split (s)	70.0	70.0	70.0	70.0	70.0	70.0	50.0	50.0	50.0	50.0	50.0	50.0	
Total Split (%)	58.3%	58.3%	58.3%	58.3%	58.3%	58.3%	41.7%	41.7%	41.7%	41.7%	41.7%	41.7%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.8	3.8	3.8	3.8	3.8	3.8	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8	6.8	6.8	6.8	6.8	
Lead/Lag													
Lead-Lag Optimize?													
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None	None	
Act Efect Green (s)	63.9	63.9	63.9	63.9	63.9	63.9	42.6	42.6	42.6	42.6	42.6	42.6	
Actuated g/C Ratio	0.53	0.53	0.53	0.53	0.53	0.53	0.36	0.36	0.36	0.36	0.36	0.36	
v/c Ratio	0.20	0.97	0.02	0.44	0.66	0.24	0.13	0.58	0.49	0.99	0.26		
Control Delay	10.9	40.7	0.3	41.6	24.6	3.9	27.0	35.7	20.9	95.7	26.9		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	10.9	40.7	0.3	41.6	24.6	3.9	27.0	35.7	20.9	95.7	26.9		
LOS	B	D	A	D	C	A	C	D	C	F	C		
Approach Delay		38.5			20.4			29.1			68.1		
Approach LOS		D			C			C			E		
Queue Length 50th (m)	4.0	100.9	0.0	4.5	99.1	2.8	8.0	67.1	29.7	53.1	23.6		
Queue Length 95th (m)	9.9	#285.2	m0.1	#19.2	139.2	14.0	17.1	97.3	55.0	#103.9	39.9		
Internal Link Dist (m)		561.2			452.7			444.3			482.1		
Turn Bay Length (m)	60.0		55.0	60.0		55.0	180.0		80.0		45.5		
Base Capacity (vph)	265	912	655	72	920	809	402	628	569	237	596		
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.20	0.97	0.02	0.44	0.66	0.24	0.13	0.57	0.49	0.97	0.26		
Intersection Summary													
Cycle Length: 120													
Actuated Cycle Length: 120													
Offset: 3 (3%), Referenced to phase 2:EBTL and 6:WBT, Start of Green													
Natural Cycle: 95													
Control Type: Actuated-Coordinated													

Lanes, Volumes, Timings
4: Cedarview & Fallowfield

2038 Future TotalAM Peak Hour
4497 O'Keefe Court

Maximum v/c Ratio: 0.99	Intersection Signal Delay: 35.0	Intersection LOS: C
	Intersection Capacity Utilization 99.5%	ICU Level of Service F
	Analysis Period (min) 15	
#	95th percentile volume exceeds capacity, queue may be longer.	
m	Volume for 95th percentile queue is metered by upstream signal.	
Splits and Phases: 4: Cedarview & Fallowfield		
Ø2 (R)	Ø4	
70 s	50 s	
Ø6 (R)	Ø8	
70 s	50 s	

Lanes, Volumes, Timings
3: Cobble Hill/O'Keefe & Fallowfield

2038 Future TotalPM Peak Hour
4497 O'Keefe Court

Lane Group													
Lane Configurations		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)		168	602	66	52	709	130	23	3	44	133	5	88
Future Volume (vph)		168	602	66	52	709	130	23	3	44	133	5	88
Satl. Flow (prot)		1523	1728	1483	1658	1695	1483	0	1418	0	1658	1254	0
Flt Permitted		0.329			0.387				0.882		0.744		
Satl. Flow (perm)		519	1728	1363	661	1695	1366	0	1248	0	1260	1254	0
Satl. Flow (RTOR)				66		87		44				88	
Lane Group Flow (vph)		168	602	66	52	709	130	0	70	0	133	93	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA		
Protected Phases		2				6			8			4	
Permitted Phases		2		2	6	6	6	8	8		4	4	
Detector Phase		2	2	2	6	6	6	8	8		4	4	
Switch Phase													
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	38.2	38.2	38.2	38.2	38.2	38.2	38.2	30.9	30.9	30.9	30.9	30.9	
Total Split (s)	88.0	88.0	88.0	88.0	88.0	88.0	88.0	32.0	32.0	32.0	32.0	32.0	
Total Split (%)	73.3%	73.3%	73.3%	73.3%	73.3%	73.3%	73.3%	26.7%	26.7%	26.7%	26.7%	26.7%	
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.7	3.7	3.7	3.7	3.7	3.7	
All-Red Time (s)	2.9	2.9	2.9	2.9	2.9	2.9	2.2	2.2	2.2	2.2	2.2	2.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.2	6.2	6.2	6.2	6.2	6.2	5.9		5.9	5.9	5.9	5.9	
Lead/Lag													
Lead-Lag Optimize?													
Recall Mode	C-Max	C-Max	C-Max	None	None	None	None	None	None	None	None	None	
Act Efft Green (s)	87.8	87.8	87.8	87.8	87.8	87.8	87.8	20.1	20.1	20.1	20.1	20.1	
Actuated g/C Ratio	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.17	0.17	0.17	0.17	0.17	
v/c Ratio	0.44	0.48	0.07	0.11	0.57	0.13		0.29	0.63	0.33			
Control Delay	8.9	6.3	0.5	12.9	19.9	7.9		21.4		58.9	12.5		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0		
Total Delay	8.9	6.3	0.5	12.9	19.9	7.9		21.4		58.9	12.5		
LOS	A	A	A	B	B	A	C	E		B			
Approach Delay		6.4			17.7			21.4			39.8		
Approach LOS		A		B		C		D					
Queue Length 50th (m)	5.4	100.0	0.0	7.4	122.7	11.4		5.0	28.0	1.0			
Queue Length 95th (m)	m16.6	51.1	m0.3	m7.7	m124.4	m11.8		17.6	48.0	14.7			
Internal Link Dist (m)		356.4			561.2		133.0		776.8				
Turn Bay Length (m)	147.5			60.0		30.5		42.5					
Base Capacity (vph)	379	1264	1015	483	1240	1023		305	274	341			
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	0.44	0.48	0.07	0.11	0.57	0.13		0.23	0.49	0.27			
Intersection Summary													
Cycle Length: 120													
Actuated Cycle Length: 120													
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green													
Natural Cycle: 80													
Control Type: Actuated-Coordinated													

Lanes, Volumes, Timings
3: Cobble Hill/O'Keefe & Fallowfield

2038 Future TotalPM Peak Hour
4497 O'Keefe Court

Maximum v/c Ratio: 0.63	Intersection Signal Delay: 15.6	Intersection LOS: B
Intersection Capacity Utilization 82.6%		ICU Level of Service E
Analysis Period (min) 15		
m Volume for 95th percentile queue is metered by upstream signal.		
Splits and Phases: 3: Cobble Hill/O'Keefe & Fallowfield		

Lanes, Volumes, Timings
4: Cedarview & Fallowfield

2038 Future TotalPM Peak Hour
4497 O'Keefe Court

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	→	↓	←	↑	→	↓	↑	→	↓	↑	→
Traffic Volume (vph)	39	613	33	148	854	111	24	182	131	306	594	56
Future Volume (vph)	39	613	33	148	854	111	24	182	131	306	594	56
Satl. Flow (prot)	1658	1745	1483	1642	1728	1483	1537	1728	1469	1658	1716	0
Flt Permitted	0.075						0.102				0.622	
Satl. Flow (perm)	131	1745	1404	444	1728	1351	165	1728	1374	1048	1716	0
Satl. Flow (RTOR)			35			65			131		5	
Lane Group Flow (vph)	39	613	33	148	854	111	24	182	131	306	650	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	2		2	6		6	4		4	8		8
Permitted Phases	2		2	6	6	6	4	4	4	8		8
Detector Phase	2	2	2	6	6	6	4	4	4	8		8
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	48.0	48.0	48.0	48.0	48.0	48.0	37.0	37.0	37.0	37.0	37.0	
Total Split (s)	67.0	67.0	67.0	67.0	67.0	67.0	53.0	53.0	53.0	53.0	53.0	
Total Split (%)	55.8%	55.8%	55.8%	55.8%	55.8%	55.8%	44.2%	44.2%	44.2%	44.2%	44.2%	
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.8	3.8	3.8	3.8	3.8	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8	6.8	6.8	6.8	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None	
Act Efect Green (s)	60.3	60.3	60.3	60.3	60.3	60.3	46.2	46.2	46.2	46.2	46.2	
Actuated g/C Ratio	0.50	0.50	0.50	0.50	0.50	0.50	0.38	0.38	0.38	0.38	0.38	
v/c Ratio	0.60	0.70	0.05	0.66	0.98	0.16	0.38	0.27	0.22	0.76	0.98	
Control Delay	48.4	16.1	1.8	39.5	57.0	7.9	47.6	26.8	4.9	46.1	67.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	48.4	16.1	1.8	39.5	57.0	7.9	47.6	26.8	4.9	46.1	67.3	
LOS	D	B	A	D	E	A	D	C	A	D	E	
Approach Delay		17.3			49.8			19.8			60.5	
Approach LOS		B			D			B			E	
Queue Length 50th (m)	4.2	67.2	0.4	25.2	191.6	5.4	4.0	29.1	0.0	61.9	148.6	
Queue Length 95th (m)	m#24.0	77.0	m1.8	#59.0	#279.7	15.0	13.9	46.7	12.2	#106.0	#225.8	
Internal Link Dist (m)		561.2			452.7			444.3			482.1	
Turn Bay Length (m)	60.0		55.0	60.0		55.0	180.0		80.0		45.5	
Base Capacity (vph)	65	876	722	223	868	711	63	665	609	403	663	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.60	0.70	0.05	0.66	0.98	0.16	0.38	0.27	0.22	0.76	0.98	
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 22 (18%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green												
Natural Cycle: 95												
Control Type: Actuated-Coordinated												

Lanes, Volumes, Timings
4: Cedarview & Fallowfield

2038 Future TotalPM Peak Hour
4497 O'Keefe Court

Maximum v/c Ratio: 0.98	Intersection Signal Delay: 42.6	Intersection LOS: D
	Intersection Capacity Utilization 123.3%	ICU Level of Service H
	Analysis Period (min) 15	
#	95th percentile volume exceeds capacity, queue may be longer.	
m	Volume for 95th percentile queue is metered by upstream signal.	
Splits and Phases: 4: Cedarview & Fallowfield		



Appendix N

TRANS Screenline 9

TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Network Coding - Lane and Capacity

Barrhaven Area

2011 Model

N/A

User Initials: TIMW
Plot Prepared: August 24, 2021
EMME Scenario: 21713



Legend

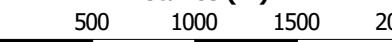
Lane Capacity	
200 vphpl	Dark Green
400 vphpl	Dark Blue
600 vphpl	Medium Blue
800 vphpl	Light Blue
1000 vphpl	Yellow
1200 vphpl	Orange
1400 vphpl	Pink
1600 vphpl	Red
1800 vphpl	Dark Red
all other	Grey



Number of Lanes Per Direction



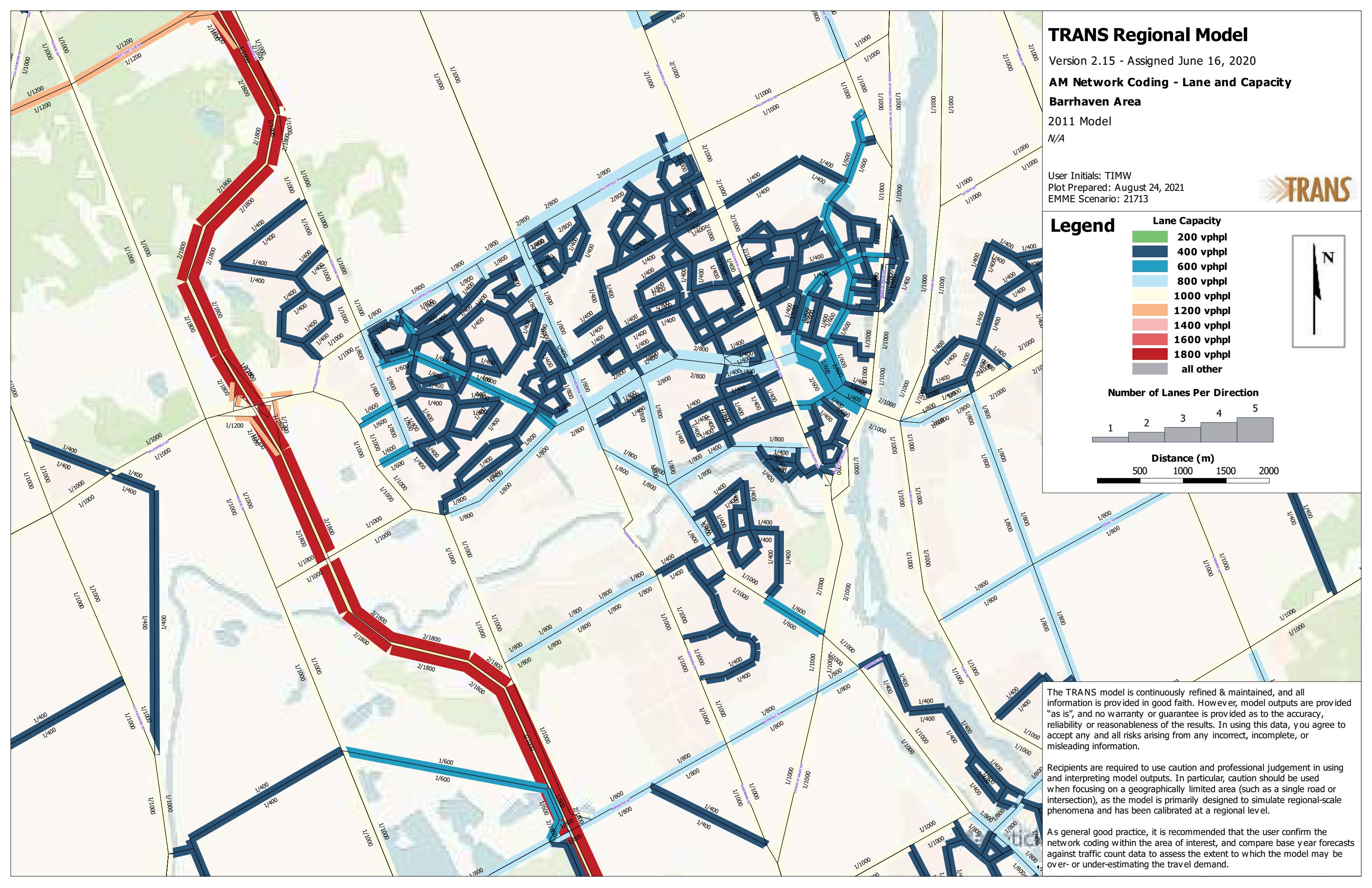
Distance (m)



The TRANS model is continuously refined & maintained, and all information is provided in good faith. However, model outputs are provided "as is", and no warranty or guarantee is provided as to the accuracy, reliability or reasonableness of the results. In using this data, you agree to accept any and all risks arising from any incorrect, incomplete, or misleading information.

Recipients are required to use caution and professional judgement in using and interpreting model outputs. In particular, caution should be used when focusing on a geographically limited area (such as a single road or intersection), as the model is primarily designed to simulate regional-scale phenomena and has been calibrated at a regional level.

As a general good practice, it is recommended that the user confirm the network coding within the area of interest, and compare base year forecasts against traffic count data to assess the extent to which the model may be over- or under-estimating the travel demand.



TRANS Regional Model

Version 2.15 - Assigned June 16, 2020

AM Network Coding - Lane and Capacity

Barrhaven Area

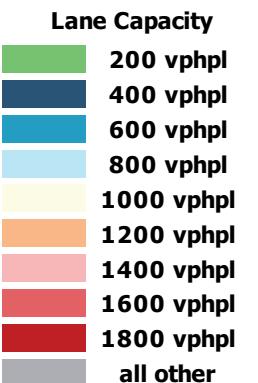
2031 Model

N/A

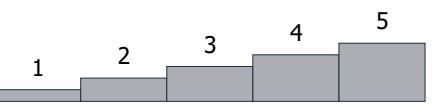
User Initials: TIMW
Plot Prepared: August 24, 2021
EMME Scenario: 21711



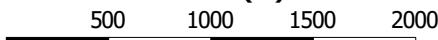
Legend



Number of Lanes Per Direction



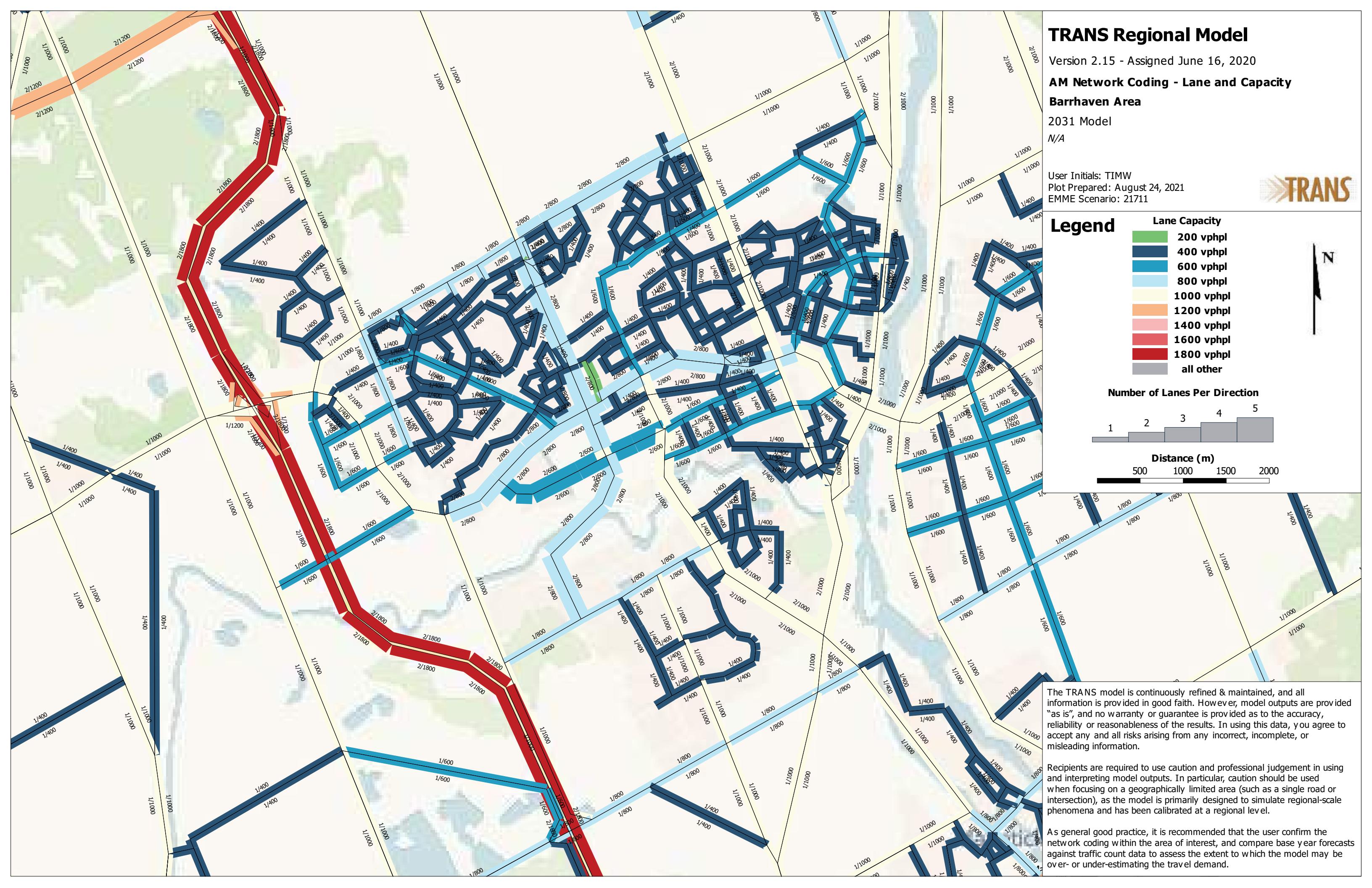
Distance (m)



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As a general good practice, it is recommended that the user confirm the network coding within the area of interest, and compare base year forecasts against traffic count data to assess the extent to which the model may be over- or under-estimating the travel demand.



Screenline	Station ID	Station Location	direction	flow_motorcycles	flow_cars	flow_light_goods	flow_buses	flow_single_trucks	flow_articulated_trucks	flow_bicycles
49	1101	Moodie Imm South of Jock River Bridge	Southbound	0	60	26	0	64	7	0
49	1101	Moodie Imm South of Jock River Bridge	Northbound	0	143	53	2	65	8	0
49	1310	Longfields Imm. South of Jock River Bridge	Southbound	0	359	59	27	5	1	0
49	1310	Longfields Imm. South of Jock River Bridge	Northbound	0	1080	82	21	11	2	2
49	50017	Prince of Wales Imm South of Jock River Bridge	Southbound	0	428	64	8	16	5	0
49	50017	Prince of Wales Imm South of Jock River Bridge	Northbound	0	1365	162	2	9	8	0
49	50052	Hwy 416 Imm. South of Jock River Bridge	Southbound	0	530	129	2	28	38	0
49	50052	Hwy 416 Imm. South of Jock River Bridge	Northbound	0	1425	321	3	41	57	0
49	50826	Greenbank Imm South of Jock River	Southbound	0	203	26	8	1	0	0
49	50826	Greenbank Imm South of Jock River	Northbound	0	607	49	19	1	1	0
49	50827	Borrisokane Imm South of Jock River Bridge	Southbound	0	154	31	1	42	3	0
49	50827	Borrisokane Imm South of Jock River Bridge	Northbound	0	481	46	1	41	0	0
9	1102	Moodie Imm. North of Fallowfield	Southbound	0	66	83	2	75	4	0
9	1102	Moodie Imm. North of Fallowfield	Northbound	1	334	126	4	38	2	0
9	1312	Greenbank Imm North of Fallowfield	Southbound	0	405	39	6	12	1	0
9	1312	Greenbank Imm North of Fallowfield	Northbound	3	1142	76	3	9	1	0
9	1502	Woodroffe Imm North of Fallowfield Transit Station	Southbound	0	452	53	6	7	1	2
9	1502	Woodroffe Imm North of Fallowfield Transit Station	Northbound	1	2042	163	8	16	1	2
9	1702	Merivale Imm North of Fallowfield	Southbound	0	167	37	4	11	2	0
9	1702	Merivale Imm North of Fallowfield	Northbound	1	1229	113	9	15	5	3
9	2301	Cedarview Imm. North of Lytle	Southbound	0	205	29	1	8	1	0
9	2301	Cedarview Imm. North of Lytle	Northbound	1	455	34	2	3	0	2
9	50030	Prince of Wales North of Fallowfield	Southbound	1	220	34	6	10	6	0
9	50030	Prince of Wales North of Fallowfield	Northbound	2	830	72	2	6	4	6
9	50051	Hwy 416 Imm. North of Strandherd	Southbound	0	793	129	5	74	47	0
9	50051	Hwy 416 Imm. North of Strandherd	Northbound	1	2382	98	8	73	52	0
9	5901	Richmond Imm. South of Hopeside	Southbound	0	240	37	2	8	0	0
9	5901	Richmond Imm. South of Hopeside	Northbound	2	192	30	5	12	4	0

Appendix O

MMLOS Analysis

Multi-Modal Level of Service - Intersections Form

Consultant	CGH Transportation	Project	2023-105
Scenario	Existing/Future	Date	5/30/2024
Comments			

		INTERSECTIONS				Fallowfield Road at Cedarview Road				Fallowfield Road/Citigate Drive at Strandherd Drive			
		Crossing Side	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST			
Pedestrian	Lanes		6	6	6	6	10+	7	10+	9			
	Median		No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m	No Median - 2.4 m						
	Conflicting Left Turns		Permissive	Permissive	Permissive	Permissive	Protected	Protected	Protected	Protected			
	Conflicting Right Turns		Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control	Permissive or yield control						
	Right Turns on Red (RToR) ?		RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed	RTOR allowed			
	Ped Signal Leading Interval?		No	No	No	No	No	No	No	No			
	Right Turn Channel		No Channel	No Channel	No Channel	No Channel	Conventional with Receiving Lane	No Channel	No Channel	No Channel			
	Corner Radius		10-15m	10-15m	10-15m	10-15m	>25m	10-15m	10-15m	10-15m			
	Crosswalk Type		Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings	Std transverse markings			
	PETSI Score		20	20	20	20	-39	12	-37	-21			
	Ped. Exposure to Traffic LoS		F	F	F	F	F	F	F	F			
	Cycle Length		85	85	85	85	120	120	120	120			
	Effective Walk Time		16	16	19	19	7	7	8	8			
	Average Pedestrian Delay		28	28	26	26	53	53	52	52			
	Pedestrian Delay LoS		C	C	C	C	E	E	E	E			
	Level of Service		F	F	F	F	F	F	F	F			
			F				F						
		Approach From	NORTH	SOUTH	EAST	WEST	NORTH	SOUTH	EAST	WEST			
Bicycle	Bicycle Lane Arrangement on Approach		Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Curb Bike Lane, Cycletrack or MUP	Curb Bike Lane, Cycletrack or MUP			
	Right Turn Lane Configuration			> 50 m	> 50 m	> 50 m	> 50 m	> 50 m	Not Applicable	Not Applicable			
	Right Turning Speed			≤ 25 km/h	≤ 25 km/h	≤ 25 km/h	>25 km/h	≤ 25 km/h	Not Applicable	Not Applicable			
	Cyclist relative to RT motorists		#N/A	F	F	F	F	F	F	Not Applicable	Not Applicable		
	Separated or Mixed Traffic		Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic	Separated	Separated			
	Left Turn Approach		One lane crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	≥ 2 lanes crossed	One lane crossed	Other LT config	2-stage, LT box			
	Operating Speed		≥ 60 km/h	> 40 to ≤ 50 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h	≥ 60 km/h			
	Left Turning Cyclist		F	E	F	F	F	F	F	A			
	Level of Service		#N/A	F	F	F	F	F	F	A			
			#N/A				F						
Transit	Average Signal Delay												
	Level of Service		-	-	-	-	-	-	-	-			
Truck	Effective Corner Radius		10 - 15 m				> 15 m						
	Number of Receiving Lanes on Departure from Intersection		1				≥ 2						
	Level of Service		-	-	E	-	A	-	B	-			
			E				B						
Auto	Volume to Capacity Ratio												
	Level of Service		-				-						