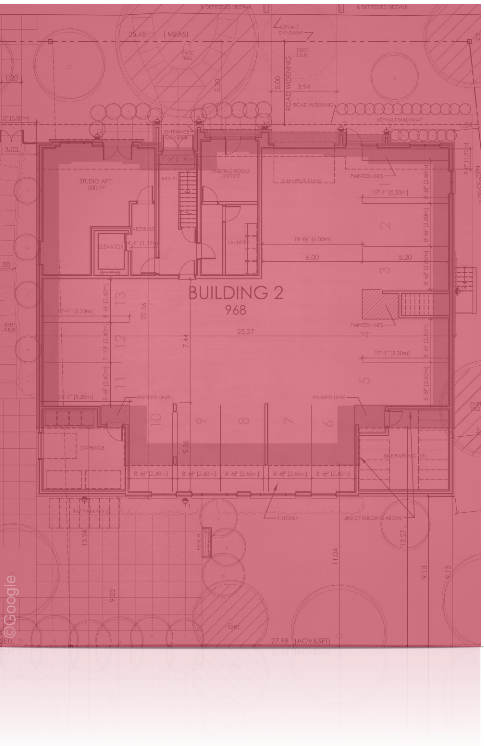
TOSCANO LAND CORPORTION

February 2018

966-974 Fisher Avenue
Transportation Brief



PARSONS

966-974 Fisher Avenue

Transportation Brief

prepared for:
Toscano Land Corporation
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Suite 100
Ottawa, ON K1J 7T2

February 2, 2018

476234 – 01000

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Transportation Brief

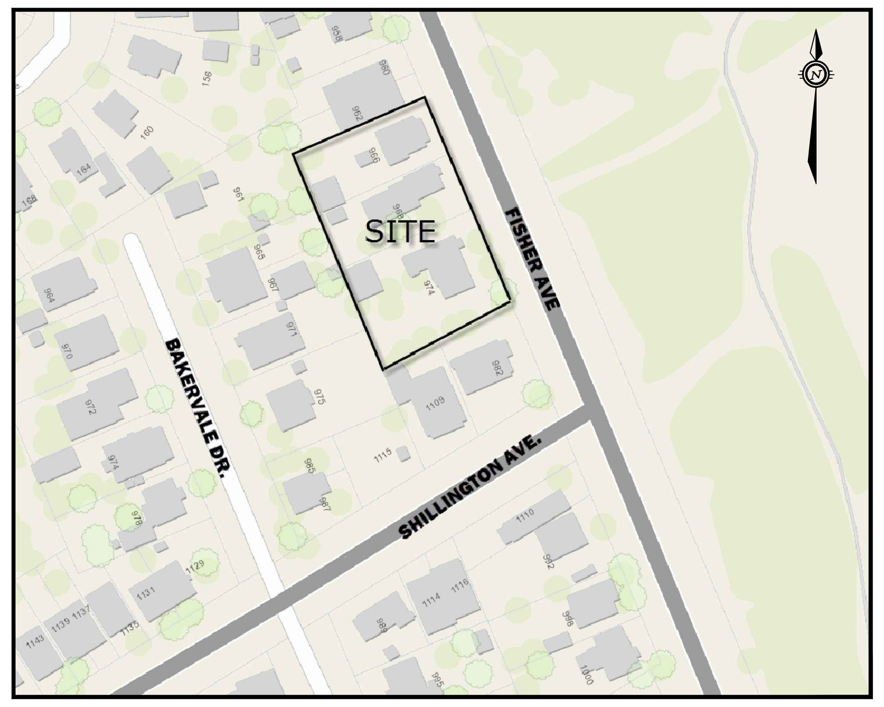
1. INTRODUCTION

Toscano is proposing a residential development consisting of 38 residential units at the site municipally known as 966, 968 and 974 Fisher Avenue. The subject site is located on the west side of Fisher Avenue, approximately 30m north of Shillington Avenue. Access to the site is proposed via two full movement driveway connections to Fisher Avenue, located approximately 35m and 65m north of Shillington Avenue. The site's local context is shown in Figure 1 and the proposed Site Plan is provided as Figure 2.

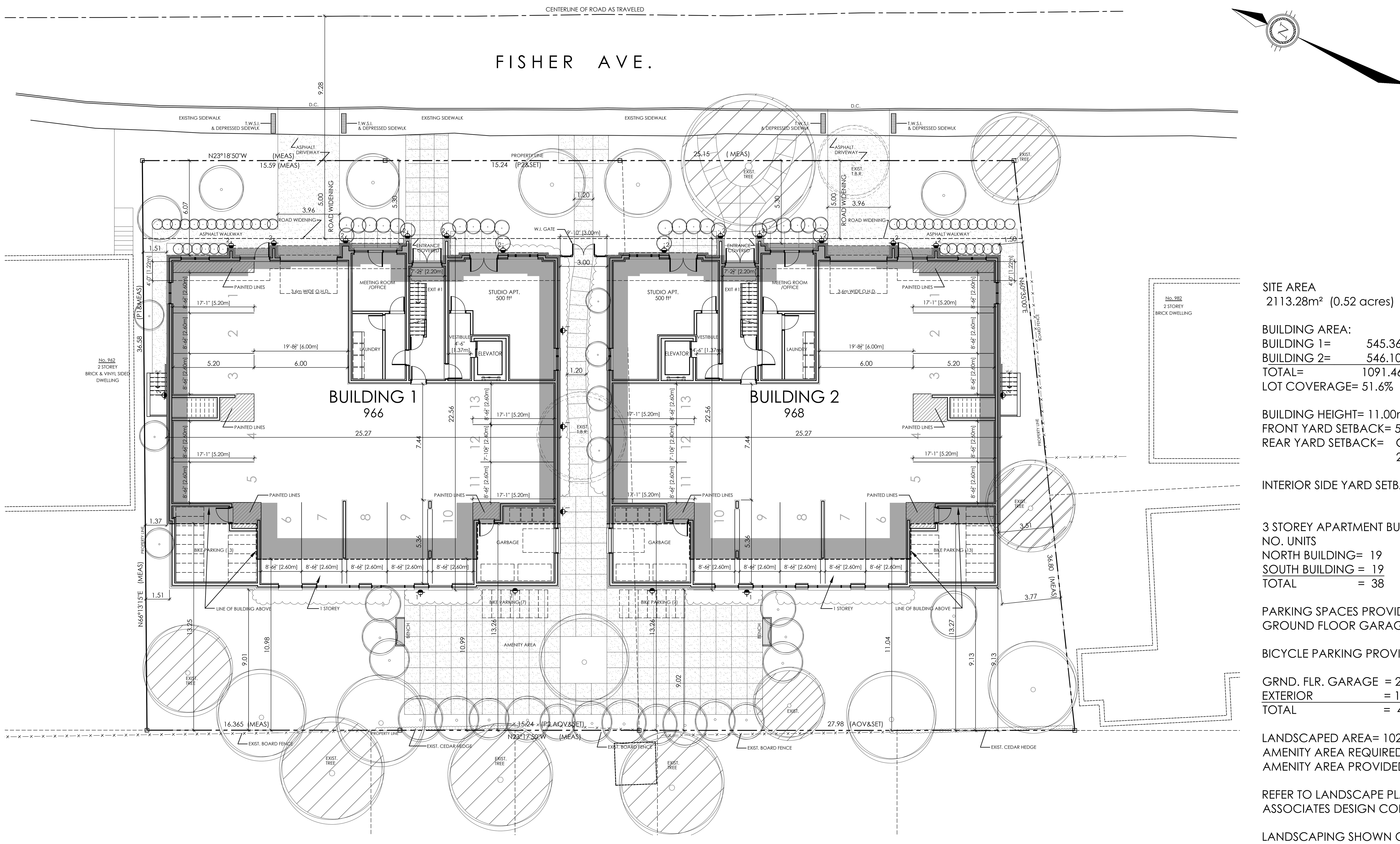
Figure 1: Local Context

Based on the ensuing trip generation and our review of the City's Transportation Impact Assessment Guidelines (TIA), the proposed development is projected to generate less than the City's 75 veh/h TIA threshold for requiring any traffic assessment. As such, no further traffic analysis is required. However, to assist in the application/review process, we have prepared this report that captures only the relevant transportation issues, which are as follows:

- Existing operational conditions at key adjacent intersections;
- Peak hour site traffic generation and assignment; and
- Site Plan issues including proposed parking supply and garage access/egress.



KEY PLAN
N.T.S.



SITE AREA
2113.28m² (0.52 acres)

BUILDING AREA:
BUILDING 1= 545.36m² (5870.25 ft²)
BUILDING 2= 546.10m² (5878.17 ft²)
TOTAL= 1091.46m²
LOT COVERAGE= 51.6%

BUILDING HEIGHT= 11.00m
FRONT YARD SETBACK= 5.30m
REAR YARD SETBACK= GROUND FLOOR @ 9.02m
2nd & 3rd FLOORS @ 10.98m

INTERIOR SIDE YARD SETBACK= 1.31m

3 STOREY APARTMENT BUILDINGS
NO. UNITS
NORTH BUILDING= 19
SOUTH BUILDING = 19
TOTAL = 38

PARKING SPACES PROVIDED
GROUND FLOOR GARAGE = 26 SPACES

BICYCLE PARKING PROVIDED

GRND. FLR. GARAGE = 26 SPACES
EXTERIOR = 14 SPACES
TOTAL = 40 SPACES

LANDSCAPED AREA= 1021.82m² (48.35%)
AMENITY AREA REQUIRED @ 6m²/ d.u. = 50x 6= 300m²
AMENITY AREA PROVIDED (COMMUNAL) = 425.6m²

REFER TO LANDSCAPE PLAN PREPARED BY THAKAR ASSOCIATES DESIGN CONSULTANTS

LANDSCAPING SHOWN ON SITE PLAN IS FOR ARCHITECTURAL INTENT

SITE PLAN
SCALE- 1:150

1 - WALL MOUNTED FLOOD LIGHT FIXTURE WITH FULL CUT-OFF

2 - ARCHITECTURAL WALL SCONCE FIXTURES (SEE ELEVATIONS)

SITE BOUNRDIES DERIVED FROM TOPOGRAPHIC PLAN OF SURVEY LOTS 47, 48 AND 49 AND PART OF LOT 50 REGISTERED PLAN 314 CITY OF OTTAWA PREPARED BY STANTEC GEOMATICS LTD. DATED: ________

SCALE 0 5 10 20 30 40

M. David Blakely
Architect Inc.
2200 Prince of Wales Dr. - Suite 101
Ottawa, Ontario K2E 6Z9
Phone (613) 226-8811 Fax (613) 226-7942

GENERAL NOTES:
1 - THE CONTRACTOR IS RESPONSIBLE FOR CHECKING AND VERIFYING ALL DIMENSIONS, ANY DISCREPANCY MUST BE REPORTED TO M. DAVID BLAKELY ARCHITECT INC.
2 - ALL WORK AND MATERIALS TO BE IN COMPLAINCE WITH ALL CODES, REGULATIONS, & BY-LAWS
3 - ADDITIONAL DRAWINGS MAY BE ISSUED FOR
4 - CLARIFICATION TO ASSIST THE PROPER EXECUTION OF WORK. SUCH DRAWINGS WILL HAVE THE SAME MEANING AND INTENT AS IF THEY WERE INCLUDED WITH THE PLANS IN CONTRACT DOCUMENTS
5 - DO NOT SCALE DRAWINGS.
6 - THIS DRAWING SHALL NOT BE USED OR COPIED WITHOUT THE AUTHORIZATION OF THE ARCHITECT
7 - THIS DRAWING SHALL NOT BE USED FOR PERMIT OR CONSTRUCTION UNLESS THE DRAWING BEARS THE ARCHITECT'S SEAL AND SIGNATURE
8 - THIS REPRODUCTION SHALL NOT BE ALTERED.

N
CONSTRUCTION NORTH

SEAL

No.	DATE	DESCRIPTION	INIT.
11.			
10.			
9.			
8.			
7.			
6.			
5.			
4.			
3.	24/01/18	REVISED FOR 3 STORIES	JB
2.	27/12/16	FOR CONSULTANTS	JB
1.	22/12/16	FOR REVIEW	JB

REVISIONS

No.	DATE	DESCRIPTION	INIT.

REVISIONS

A
B | C

A - DETAIL NUMBER
B - SHEET NUMBER (DETAIL REQUIRED)
C - SHEET NUMBER (DETAIL LOCATION)

PROJECT:
3 STOREY APARTMENT BUILDING
966-968 FISHER AVE.
OTTAWA, ONTARIO

CLIENT:
TOSCANO LAND CORPORATION

DRAWING TITLE:
SITE PLAN

DATE: DEC. , 2016.
SCALE: 1: 150
SHEET No.: SP-1
DRAWN BY: JB
CHECKED: MDB

2. EXISTING CONDITIONS

2.1. AREA ROAD NETWORK

Fisher Avenue is a north-south arterial roadway and is a designated truck route. It extends from Carling Avenue in the north to Prince of Wales Drive in the south. Along the site's frontage, Fisher Avenue has a 20m right-of-way (ROW), consisting of a single vehicle travel lane in each direction. The east side of the road is a rural cross-section with a paved shoulder, and the taper for a southbound right turn lane at Shillington Avenue begins across the frontage of the subject site. An on-street parking lane is provided north of Shillington Avenue The speed limit within the study area is 50 km/h.

Shillington Avenue is an east-west collector roadway that extends from Merivale Road to Fisher Avenue. The cross-section has a ROW of 18.5m and consists of a single travel lane in each direction, with an auxiliary left-turn lane at Fisher Avenue. Residential driveways access directly onto the roadway and on-street parking is permitted along the north side of the roadway, approximately 40m west of Fisher Avenue. The speed limit within the study area is 50 km/h.

Tunis Avenue is an east-west local roadway that extends from Anna Avenue to the National Capital Commission Driveway. Its cross-section consists of a 20m ROW and single travel lanes in each direction. On-street parking is permitted along both sides of the roadway. The unposted speed limit is understood to be 50 km/h.

2.2. PEDESTRIAN/CYCLING NETWORK

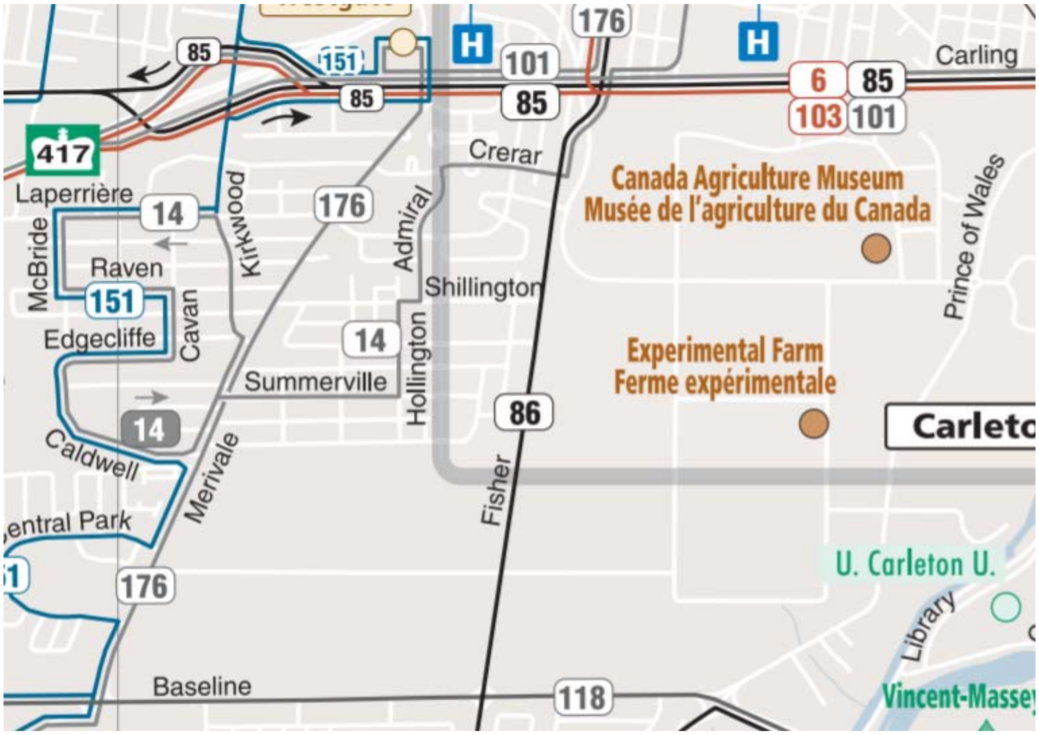
Sidewalk facilities within the vicinity of the site are provided along the west side of Fisher Avenue, south side of Shillington Avenue and both sides of Tunis Avenue, connecting pedestrians to nearby transit stops, other adjacent development and recreational opportunities. With respect to cycling, bike facilities are currently limited to shared-use lanes along Fisher Avenue, Shillington Avenue, and Tunis Avenue. The northbound paved shoulder along Fisher Avenue provides additional room for cyclists and the pathway system within the Experimental Farm provides an off road alternative. The City's Cycling Plan indicates Fisher Avenue Rideau as a Spine Route and both Shillington Avenue and Tunis Avenue as Local Routes.

2.3. TRANSIT NETWORK

Transit service within the vicinity of the site is currently provided by OC Transpo Regular Routes #14 and 86, which provide frequent all-day service. Bus stops for these routes are located at the Fisher/Shillington, Fisher/Tunis and Fisher/Crerar intersections, adjacent to the proposed development. Given the prominent role of route #86, and it feeds directly to the future LRT and downtown core, the number of peak period buses stopping at the bus stops adjacent to the subject site are significant. The current route is estimated to take 12 minutes to travel from Shillington to Bayview.

Figure 3 illustrates the existing transit network within the vicinity of the subject site.

Figure 3: Existing Area Transit Network



2.4. EXISTING INTERSECTION OPERATIONS

Illustrated as Figure 4, are the most recent weekday morning and afternoon peak hour traffic volumes obtained from the City of Ottawa for the Fisher/Shillington and Fisher/Tunis intersections. Peak hour traffic volumes are included as Appendix A.

The following Table 1 provides a summary of existing traffic operations at the signalized study area intersection based on the SYNCHRO (V9) traffic analysis software. The subject Fisher/Shillington and Fisher/Tunis intersections were assessed in terms of the volume-to-capacity (v/c) ratio, delay (s), and the corresponding Level of Service (LoS) for the critical movement(s). The subject intersection 'as a whole' was assessed based on a weighted v/c ratio/delay, and the SYNCHRO model output of existing conditions is provided within Appendix B.

Figure 4: Existing Peak Hour Traffic Volumes (2017)

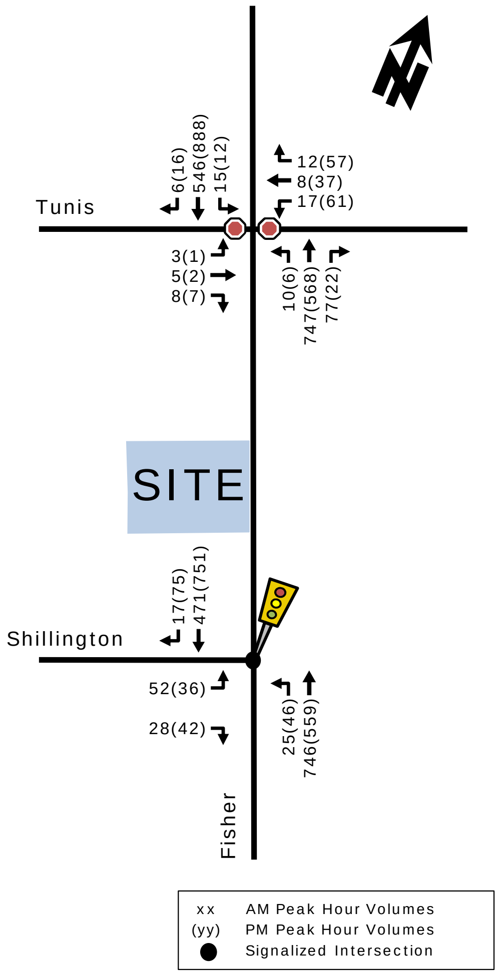


Table 1: Existing Performance at Study Area Intersections

Intersection	Weekday AM Peak (PM Peak)					
	'Critical Movement'			'Intersection as a Whole'		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Fisher/Shillington	A(B)	0.60(0.62)	NBT(SBT)	7.2(6.5)	A(B)	0.60(0.62)
Fisher/Tunis	E(F)	43.7(161.9)	WB(WB)	1.9(15.4)	A(B)	-(-)

Note: Analysis of intersections assumes a PHF of 0.90 and a saturation flow rate of 1800 veh/h/lane.

As shown in Table 1, the Fisher/Shillington intersection, 'as a whole', is currently operating at an acceptable LoS 'A' during the morning peak and LoS 'B' during the afternoon peak, with respect to the City of Ottawa operating standards. During the morning peak hour, the critical movement is the northbound through movement with a v/c of 0.60 and a 95%ile queue of approximately 88m. Similarly, the afternoon peak critical movement is the southbound through and operates with a v/c of 0.62 and a 95%ile queue of approximately 88m.

The Fisher/Tunis intersection, 'as a whole' is currently operating at an acceptable LoS B or better. During the morning and afternoon peak, the critical movement is the westbound shared left-through-right movement, which is currently operating at a LoS of 'E' and 'F', respectively. According to the SYNCHRO analysis, the delays experienced during the morning peak are approximately 44 seconds and during the afternoon peak, the delays exceed 160 seconds.

Field observations were conducted to determine if the modelled PM peak delays of 160 seconds and greater were an accurate representation of the operations at the Tunis Avenue intersection, specifically the westbound movement from the Experimental Farm. A 15-minute observation of the turning movements and delays for the westbound movement were completed on March 22, 2017 during the peak hour between 4pm and 5pm. A total of 34 vehicles were counted during the 15-minute period, including 7 right-turns, 14 throughs and 13 left-turns. The longest delay noted was 130 seconds and the average delay was 33 seconds. Breaking the delays down per movement, the average delay for left-turn movement was 28 seconds, the through movement was 39 seconds, and the right-turn movement was 32 seconds. Based on the field observations, it is evident that the Synchro analysis overestimates the existing delay experienced at the Fisher Avenue and Tunis Avenue intersection and a LoS "C" would be considered a more appropriate gauge of performance.

3. DEMAND FORECASTING

3.1. SITE TRIP GENERATION

Appropriate trip generation rates for the proposed development consisting of 50 residential units was obtained from the 9th Edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual, which are summarized in Table 2.

Table 2: ITE Trip Generation Rates

Land Use	Data Source	Trip Rates	
		AM Peak	PM Peak
Mid-Rise Apartments	ITE 223	T = 0.30(du); T = 0.41(du) – 13.06	T = 0.39(du); T = 0.48(du) – 11.07
Notes: T = Average Vehicle Trip Ends du = dwelling units			

As ITE trip generation surveys only record vehicle trips and typically reflect highly suburban locations (with little to no access by travel modes other than private automobiles), adjustment factors appropriate to the more urban study area context were applied to attain estimates of person trips for the proposed development. This approach is considered appropriate within the industry for urban infill developments.

To convert ITE vehicle trip rates to person trips, an auto occupancy factor and a non-auto trip factor were applied to the ITE vehicle trip rates. Our review of available literature suggests that a combined factor of approximately 1.3 is considered reasonable to account for typical North American auto occupancy values of approximately 1.15 and combined transit and non-motorized modal shares of less than 10%. As such, the person trip generation for the proposed site is summarized in Table 3.

Table 3: Modified Person Trip Generation

Land Use	Area	AM Peak (person trips/h)			PM Peak (person trips/h)		
		In	Out	Total	In	Out	Total
Mid-Rise Apartments	38 du	0	3	3	5	4	9
Total 'New' Person Trips		0	3	3	5	4	9
Note: 1.3 factor to account for typical North American auto occupancy values of approximately 1.15 and combined transit and non-motorized modal shares of less than 10%							

The person trips shown in Table 3 for the proposed site were then allocated using modal share values appropriate for the location and proximity to adjacent communities, employment, other shopping uses and transit availability. Modal share values for the proposed residential development has been summarized in Table 4, with the total site vehicle trip generation.

Table 4: Residential Modal Site Trip Generation

Travel Mode	Mode Share	AM Peak (person trips/h)			PM Peak (person trips/h)		
		In	Out	Total	In	Out	Total
Auto Driver	60%	0	2	2	3	3	6
Auto Passenger	15%	0	1	1	1	1	2
Transit	20%	0	0	0	1	0	1
Non-motorized	5%	0	0	0	0	0	0
Total Person Trips	100%	0	3	3	5	4	9
Total 'New' Auto Trips		0	2	2	3	3	6

As shown in Table 4, the resulting number of potential 'new' two-way vehicle trips for the proposed development is approximately 2 and 6 veh/h during the weekday morning and afternoon peak hours, respectively. This amount of traffic, which equates to approximately 1 new vehicle every 10 to 30 minutes, which is considered negligible in terms of traffic impact on the study area.

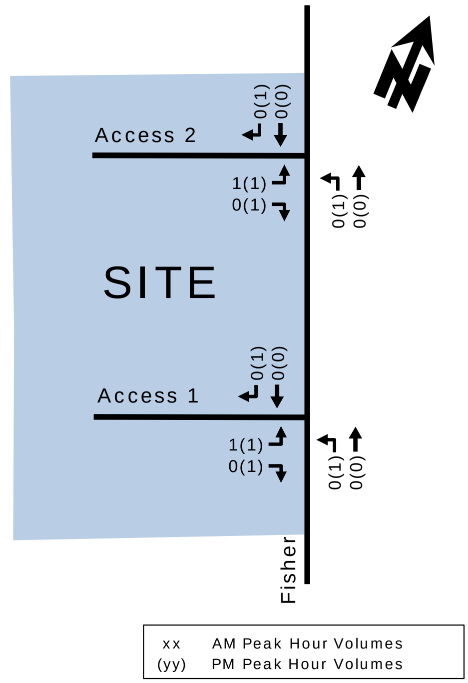
3.2. VEHICLE TRAFFIC DISTRIBUTION AND ASSIGNMENT

Site-generated traffic distribution was based on the site's proximity to the downtown core and our knowledge of the surrounding area. The resultant distribution is outlined as follows:

- 60% to/from the north via Fisher Avenue; and
- 40% to/from the south via Fisher Avenue.

Based on the above-noted distributions, 'new' site-generated trips were assigned to the study area and are illustrated as Figure 5.

Figure 5: 'New' Site-Generated Traffic Volumes



4. SITE PLAN REVIEW

This section provides an overview of site access, parking requirements, pedestrian circulation and transit accessibility. The proposed Site Plan was previously illustrated as Figure 2.

Parking

A total of 26 parking spaces are proposed to serve the subject site. This amount of parking satisfies the City's minimum By-Law requirement for Area X, identified in Schedule 1A of the City's Zoning By-Law, for 18 residential spaces and 4 visitor spaces. Parking spaces are noted as 5.2m in length and 2.6m in width, with the exception of one space in each building with a 2.4m width, but these all meet the City's minimum By-Law requirements.

Site Circulation

With regard to on-site circulation, the proposed parking garage is laid out effectively, such that two-way traffic can be efficiently accommodated. The proposed drive aisle entrance to the ground level parking for each building is only 6.0m, and while that below the City's By-Law requirements of 6.7m, is not expected to cause a major issue for the low volumes anticipated on site.

Access Requirements

The propose accesses meet the City's By-Law requirements for two 2-way accesses along a frontage greater than 35m. The accesses, while in auxiliary southbound right turn lane along Fisher Avenue, are spaced appropriately within the site and are anticipated to serve less than 10 vehicles during the afternoon peak. The southbound queues may block access to the site driveways, based on existing conditions, although this will be similar to the existing conditions for the three current residential driveways.

Pedestrians/Transit
To connect pedestrians to transit service and recreation opportunities, sidewalks are currently provided along the frontage of the site and crossing locations are provided to the east side of Fisher Avenue. Bus stops are currently provided along Fisher Avenue immediately adjacent to the site.

Bicycles
A total of 40 bicycle parking spaces are proposed to serve the subject development. This amount of bicycle parking is sufficient with respect to the City's By-Law requirement. The bicycle parking is provided within the parking garages (26 spaces total) and at the rear of the buildings (14 spaces total) adjacent to the amenity space.

5. FINDINGS AND RECOMMENDATIONS

Based on the foregoing analysis of the proposed development, the following are the transportation-related findings and recommendations of this report.

- The study area intersections adjacent to the site is currently operating 'as a whole' at an acceptable LoS 'B' or better during the weekday morning and afternoon peak hours;
- With regard to westbound 'critical movement' at the unsignalized Fisher/Tunis intersection, it is noted as operating at an LoS 'E' during the morning peak and an LoS 'F' during the afternoon peak;
- The proposed development is projected to generate 'new' two-way vehicle volumes of approximately 2 and 6 veh/h during the weekday morning and afternoon peak hours, respectively. This equates to approximately 1 new vehicle every 10 to 30 minutes, and as such, the impact of the site-generated vehicles on the study area network is considered negligible;
- Given the low traffic generated by the proposed development, the location of the south site driveway, close to the Fisher/Shillington intersection, is considered acceptable;
- The site's driveway connections to Fisher Avenue are 0.7m less than the City's Private Approach By-Law requirements within the ground floor parking garage, but is not anticipated to be an issue with the low vehicular volumes anticipated for the site; and
- The proposed vehicle/bicycle parking supply and dimensioning is noted as being sufficient with respect to the City's By-Law requirements.

Based on the foregoing, the proposed development fits well into the transportation context of the surrounding area, and its location and design serves to promote use of walking, cycling, and transit modes, thus supporting City of Ottawa policies, goals and objectives with respect to redevelopment, intensification and modal share.

Therefore, the proposed 966-974 Fisher Avenue residential development is recommended from a transportation perspective.

Prepared By:

LICENSED PROFESSIONAL ENGINEER
A. J. HARTE
100149314
Feb. 2, 2018
PROVINCE OF ONTARIO

Andrew Harte, P.Eng.
Transportation Engineer

Reviewed By:

Christopher Gordon, P.Eng.
Senior Project Manager

Appendix A

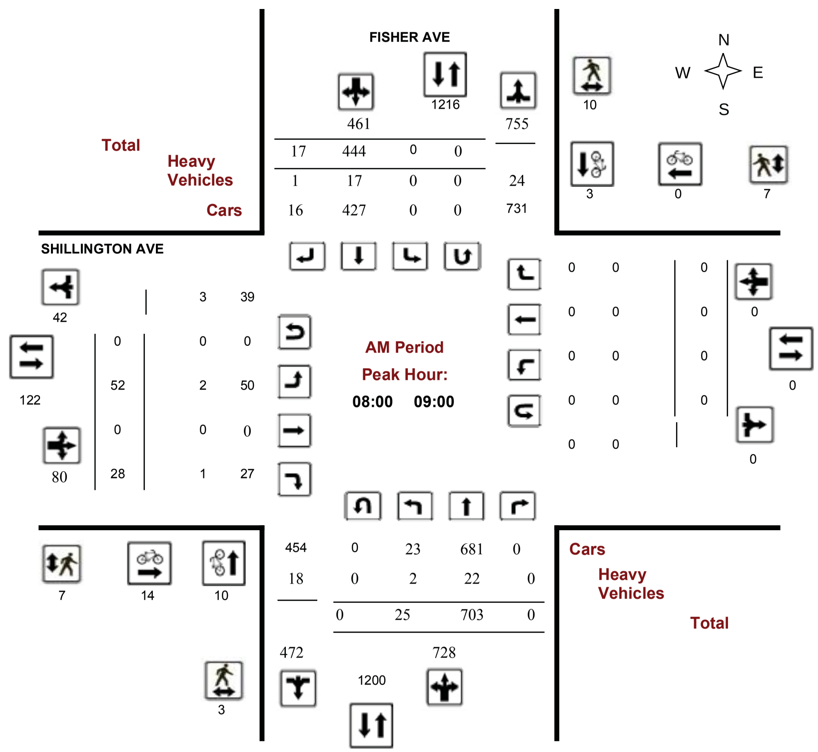
Current Peak Hour Traffic Volumes

Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

FISHER AVE @ SHILLINGTON AVE

Survey Date: Friday, July 18, 2014
Start Time: 07:00
WO No: 29238
Device: Jamar Technologies, Inc



Comments

Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

FISHER AVE @ SHILLINGTON AVE

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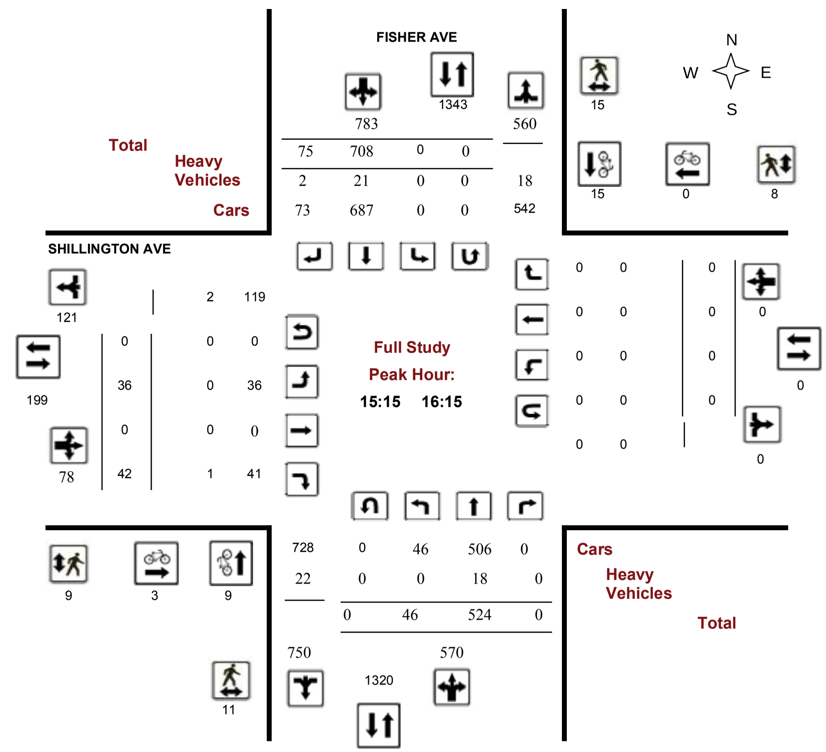

Comments

Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

FISHER AVE @ SHILLINGTON AVE

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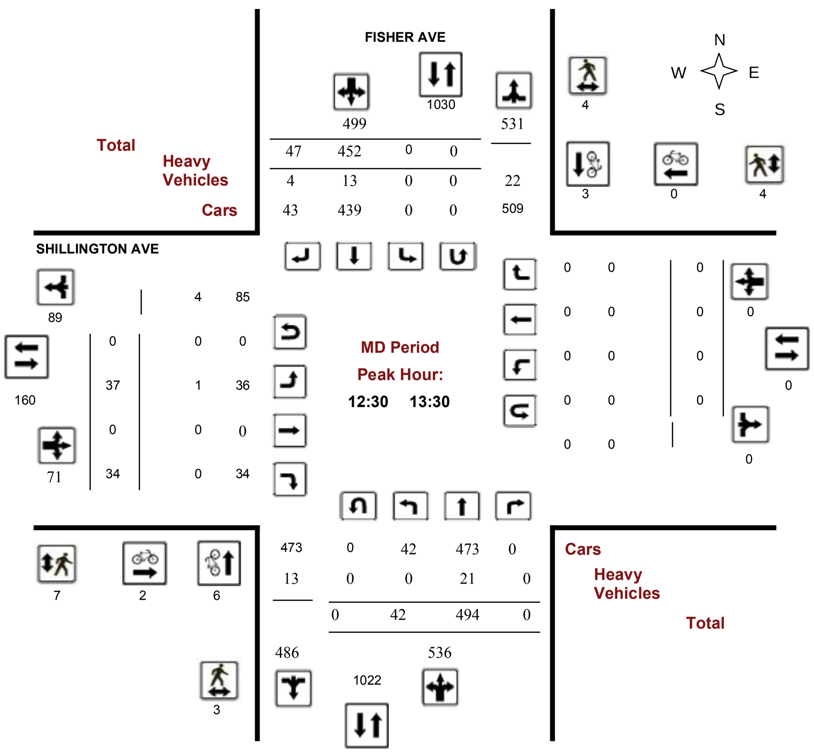


Comments

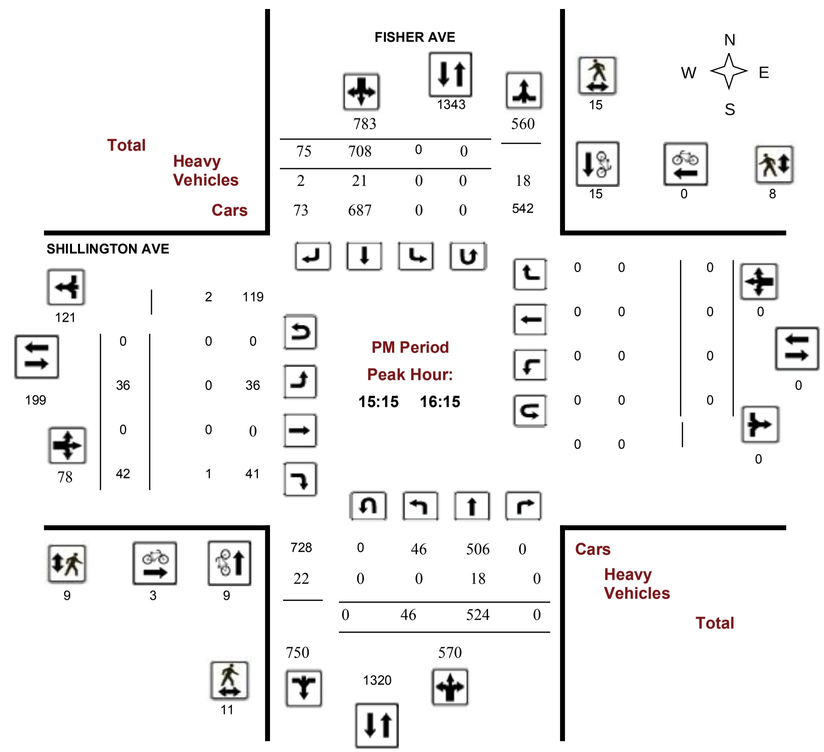
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

FISHER AVE @ SHILLINGTON AVE

Survey Date: Friday, July 18, 2014
Start Time: 07:00

WO No: 29238
Device: Jamar Technologies, Inc



Comments

Transportation Services - Traffic Services

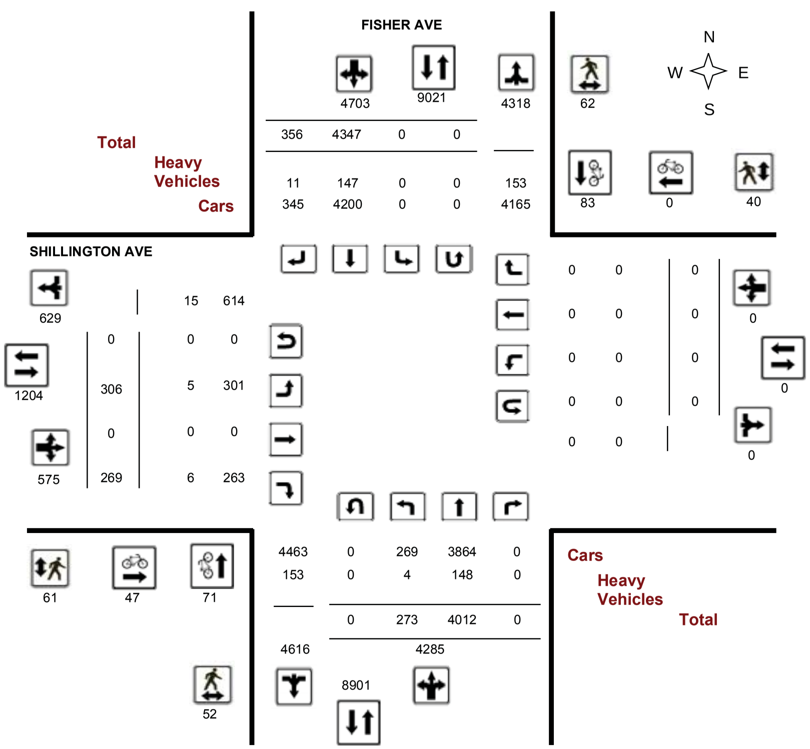
Turning Movement Count - Full Study Diagram

FISHER AVE @ SHILLINGTON AVE

Survey Date: Friday, July 18, 2014

WO#: 29238

Device: Jamar Technologies, Inc



Comments

Transportation Services - Traffic Services

Work Order 29238

Turning Movement Count - Full Study Summary Report

FISHER AVE @ SHILLINGTON AVE

Survey Date: Friday, July 18, 2014

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 0 Westbound: 0

AADT Factor .90

Full Study

	FISHER AVE									SHILLINGTON AVE									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	22	519	0	**541**	0	415	21	**436**	**977**	47	0	28	**75**	0	0	0	**0**	**75**	**1052**
08:00 09:00	25	703	0	**728**	0	444	17	**461**	**1189**	52	0	28	**80**	0	0	0	**0**	**80**	**1269**
09:00 10:00	23	452	0	**475**	0	438	31	**469**	**944**	25	0	30	**55**	0	0	0	**0**	**55**	**999**
11:30 12:30	20	448	0	**468**	0	530	33	**563**	**1031**	34	0	32	**66**	0	0	0	**0**	**66**	**1097**
12:30 13:30	42	494	0	**536**	0	452	47	**499**	**1035**	37	0	34	**71**	0	0	0	**0**	**71**	**1106**
15:00 16:00	41	548	0	**589**	0	667	68	**735**	**1324**	36	0	42	**78**	0	0	0	**0**	**78**	**1402**
16:00 17:00	46	422	0	**468**	0	753	82	**835**	**1303**	37	0	41	**78**	0	0	0	**0**	**78**	**1381**
17:00 18:00	54	426	0	**480**	0	648	57	**705**	**1185**	38	0	34	**72**	0	0	0	**0**	**72**	**1257**
Sub Total	273	4012	0	**4285**	0	4347	356	**4703**	**8988**	306	0	269	**575**	0	0	0	**0**	**575**	**9563**
U Turns				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	273	4012	0	**4285**	0	4347	356	**4703**	**8988**	306	0	269	**575**	0	0	0	**0**	**575**	**9563**
EQ 12Hr	379	5577	0	**5956**	0	6042	495	**6537**	**12493**	425	0	374	**799**	0	0	0	**0**	**799**	**13292**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.													**1.39**						
AVG 12Hr	342	5019	0	**5361**	0	5438	445	**5883**	**11244**	383	0	337	**719**	0	0	0	**0**	**719**	**11963**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.													**.90**						
AVG 24Hr	447	6575	0	**7022**	0	7124	583	**7707**	**14729**	501	0	441	**942**	0	0	0	**0**	**942**	**15671**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.													**1.31**						

Comments:

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

Transportation Services - Traffic Services

W.O. 29238

Turning Movement Count - 15 Minute Summary Report

FISHER AVE @ SHILLINGTON AVE

Survey Date: Friday, July 18, 2014

Total Observed U-Turns

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

	FISHER AVE									SHILLINGTON AVE									
	Northbound				Southbound					Eastbound				Westbound					
Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00 07:15	5	112	0	**117**	0	103	3	**106**	**223**	3	0	4	**7**	0	0	0	**0**	**7**	**230**
07:15 07:30	3	127	0	**130**	0	98	7	**105**	**235**	14	0	4	**18**	0	0	0	**0**	**18**	**253**
07:30 07:45	7	135	0	**142**	0	106	4	**110**	**252**	16	0	12	**28**	0	0	0	**0**	**28**	**280**
07:45 08:00	7	145	0	**152**	0	108	7	**115**	**267**	14	0	8	**22**	0	0	0	**0**	**22**	**289**
08:00 08:15	5	144	0	**149**	0	113	3	**116**	**265**	11	0	4	**15**	0	0	0	**0**	**15**	**280**
08:15 08:30	5	186	0	**191**	0	114	1	**115**	**306**	15	0	8	**23**	0	0	0	**0**	**23**	**329**
08:30 08:45	7	190	0	**197**	0	105	7	**112**	**309**	11	0	8	**19**	0	0	0	**0**	**19**	**328**
08:45 09:00	8	183	0	**191**	0	112	6	**118**	**309**	15	0	8	**23**	0	0	0	**0**	**23**	**332**
09:00 09:15	5	100	0	**105**	0	103	12	**115**	**220**	10	0	10	**20**	0	0	0	**0**	**20**	**240**
09:15 09:30	6	134	0	**140**	0	117	4	**121**	**261**	4	0	6	**10**	0	0	0	**0**	**10**	**271**
09:30 09:45	7	103	0	**110**	0	111	9	**120**	**230**	6	0	6	**12**	0	0	0	**0**	**12**	**242**
09:45 10:00	5	115	0	**120**	0	107	6	**113**	**233**	5	0	8	**13**	0	0	0	**0**	**13**	**246**
11:30 11:45	5	100	0	**105**	0	128	10	**138**	**243**	7	0	9	**16**	0	0	0	**0**	**16**	**259**
11:45 12:00	6	117	0	**123**	0	142	9	**151**	**274**	14	0	13	**27**	0	0	0	**0**	**27**	**301**
12:00 12:15	8	112	0	**120**	0	130	8	**138**	**258**	7	0	7	**14**	0	0	0	**0**	**14**	**272**
12:15 12:30	1	119	0	**120**	0	130	6	**136**	**256**	6	0	3	**9**	0	0	0	**0**	**9**	**265**
12:30 12:45	13	114	0	**127**	0	102	18	**120**	**247**	12	0	5	**17**	0	0	0	**0**	**17**	**264**
12:45 13:00	8	117	0	**125**	0	120	12	**132**	**257**	11	0	11	**22**	0	0	0	**0**	**22**	**279**
13:00 13:15	11	137	0	**148**	0	104	11	**115**	**263**	4	0	9	**13**	0	0	0	**0**	**13**	**276**
13:15 13:30	10	126	0	**136**	0	126	6	**132**	**268**	10	0	9	**19**	0	0	0	**0**	**19**	**287**
15:00 15:15	8	145	0	**153**	0	154	12	**166**	**319**	8	0	9	**17**	0	0	0	**0**	**17**	**336**
15:15 15:30	12	135	0	**147**	0	181	25	**206**	**353**	14	0	12	**26**	0	0	0	**0**	**26**	**379**
15:30 15:45	10	141	0	**151**	0	159	18	**177**	**328**	10	0	8	**18**	0	0	0	**0**	**18**	**346**
15:45 16:00	11	127	0	**138**	0	173	13	**186**	**324**	4	0	13	**17**	0	0	0	**0**	**17**	**341**
16:00 16:15	13	121	0	**134**	0	195	19	**214**	**348**	8	0	9	**17**	0	0	0	**0**	**17**	**365**
16:15 16:30	13	107	0	**120**	0	189	22	**211**	**331**	14	0	10	**24**	0	0	0	**0**	**24**	**355**
16:30 16:45	6	95	0	**101**	0	203	20	**223**	**324**	5	0	11	**16**	0	0	0	**0**	**16**	**340**
16:45 17:00	14	99	0	**113**	0	166	21	**187**	**300**	10	0	11	**21**	0	0	0	**0**	**21**	**321**
17:00 17:15	14	123	0	**137**	0	160	13	**173**	**310**	8	0	13	**21**	0	0	0	**0**	**21**	**331**
17:15 17:30	8	99	0	**107**	0	184	15	**199**	**306**	8	0	7	**15**	0	0	0	**0**	**15**	**321**
17:30 17:45	17	107	0	**124**	0	154	12	**166**	**290**	11	0	9	**20**	0	0	0	**0**	**20**	**310**
17:45 18:00	15	97	0	**112**	0	150	17	**167**	**279**	11	0	5	**16**	0	0	0	**0**	**16**	**295**
TOTAL:	273	4012	0	**4285**	0	4347	356	**4703**	**8988**	306	0	269	**575**	0	0	0	**0**	**575**	**9563**

Note: U-Turns are included in Totals.

Comment:

Transportation Services - Traffic Services

Turning Movement Count - Cyclist Volume Report

Work Order 29238

FISHER AVE @ SHILLINGTON AVE

Count Date: Friday, July 18, 2014 **Start Time:** 07:00

	FISHER AVE			SHILLINGTON AVE			
Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00 08:00	10	12	**22**	7	0	**7**	**29**
08:00 09:00	10	3	**13**	14	0	**14**	**27**
09:00 10:00	9	8	**17**	6	0	**6**	**23**
11:30 12:30	8	8	**16**	3	0	**3**	**19**
12:30 13:30	6	3	**9**	2	0	**2**	**11**
15:00 16:00	10	11	**21**	2	0	**2**	**23**
16:00 17:00	11	21	**32**	7	0	**7**	**39**
17:00 18:00	7	17	**24**	6	0	**6**	**30**
Total	71	83	**154**	47	0	**47**	**201**

Comment:

Note: These volumes consists of bicycles only (no mopeds or motorcycles) and ARE NOT included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

W.O. 29238

Turning Movement Count - Heavy Vehicle Report

FISHER AVE @ SHILLINGTON AVE

Survey Date: Friday, July 18, 2014

	FISHER AVE										SHILLINGTON AVE										
	Northbound				Southbound						Eastbound				Westbound						
Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT		LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00 08:00	1	28	0	29	0	13	3	16	45		1	0	0	1	0	0	0	0	1	46
08:00 09:00	2	22	0	24	0	17	1	18	42		2	0	1	3	0	0	0	0	3	45
09:00 10:00	1	15	0	16	0	18	1	19	35		0	0	2	2	0	0	0	0	2	37
11:30 12:30	0	15	0	15	0	21	0	21	36		1	0	1	2	0	0	0	0	2	38
12:30 13:30	0	21	0	21	0	13	4	17	38		1	0	0	1	0	0	0	0	1	39
15:00 16:00	0	21	0	21	0	17	1	18	39		0	0	1	1	0	0	0	0	1	40
16:00 17:00	0	12	0	12	0	23	1	24	36		0	0	1	1	0	0	0	0	1	37
17:00 18:00	0	14	0	14	0	25	0	25	39		0	0	0	0	0	0	0	0	0	39
Sub Total	4	148	0	152	0	147	11	158	310		5	0	6	11	0	0	0	0	11	321
U-Turns (Heavy Vehicles)				0				0	0					0				0	0	0
Total	4	148	0	0	0	147	11	158	310		5	0	6	11	0	0	0	0	11	321

Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

Work Order 29238

Turning Movement Count - Pedestrian Volume Report

FISHER AVE @ SHILLINGTON AVE

Count Date: Friday, July 18, 2014 **Start Time:** 07:00

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	1	1	2	0	1	1	3
07:15 07:30	1	1	2	1	0	1	3
07:30 07:45	2	4	6	2	1	3	9
07:45 08:00	1	4	5	2	2	4	9
07:00 08:00	5	10	15	5	4	9	24
08:00 08:15	2	6	8	3	3	6	14
08:15 08:30	0	2	2	2	1	3	5
08:30 08:45	1	1	2	0	2	2	4
08:45 09:00	0	1	1	2	1	3	4
08:00 09:00	3	10	13	7	7	14	27
09:00 09:15	4	3	7	3	0	3	10
09:15 09:30	0	1	1	2	1	3	4
09:30 09:45	0	0	0	5	2	7	7
09:45 10:00	0	2	2	3	0	3	5
09:00 10:00	4	6	10	13	3	16	26
11:30 11:45	2	0	2	0	0	0	2
11:45 12:00	1	4	5	4	1	5	10
12:00 12:15	11	0	11	1	0	1	12
12:15 12:30	1	1	2	1	1	2	4
11:30 12:30	15	5	20	6	2	8	28
12:30 12:45	0	0	0	2	1	3	3
12:45 13:00	1	1	2	2	2	4	6
13:00 13:15	2	1	3	2	1	3	6
13:15 13:30	0	2	2	1	0	1	3
12:30 13:30	3	4	7	7	4	11	18
15:00 15:15	1	0	1	0	0	0	1
15:15 15:30	2	5	7	4	1	5	12
15:30 15:45	9	10	19	2	2	4	23
15:45 16:00	0	0	0	1	3	4	4
15:00 16:00	12	15	27	7	6	13	40
16:00 16:15	0	0	0	2	2	4	4
16:15 16:30	0	3	3	1	1	2	5
16:30 16:45	1	4	5	0	0	0	5
16:45 17:00	1	1	2	0	1	1	3
16:00 17:00	2	8	10	3	4	7	17
17:00 17:15	0	0	0	4	5	9	9
17:15 17:30	2	3	5	5	1	6	11
17:30 17:45	1	0	1	3	4	7	8
17:45 18:00	5	1	6	1	0	1	7
17:00 18:00	8	4	12	13	10	23	35
Total	52	62	114	61	40	101	215

Comment:

Transportation Services - Traffic Services

Work Order 29238

Turning Movement Count - 15 Min U-Turn Total Report

FISHER AVE @ SHILLINGTON AVE

Survey Date: Friday, July 18, 2014

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	0	0	0	0	0
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	0	0
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	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
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		0	0	0	0	0

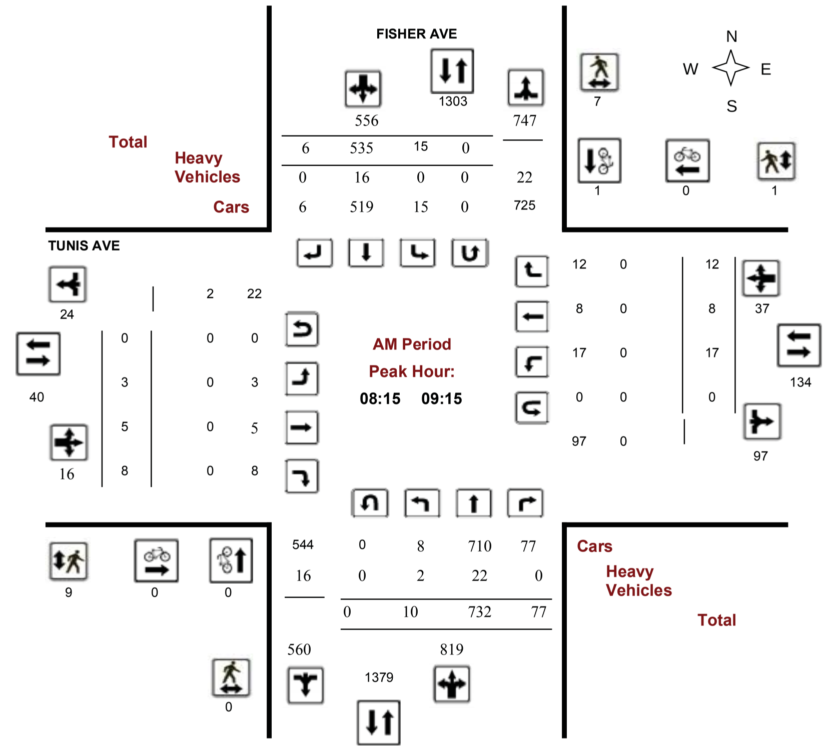
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

FISHER AVE @ TUNIS AVE

Survey Date: Thursday, November 24, 2016 **WO No:** 36540

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



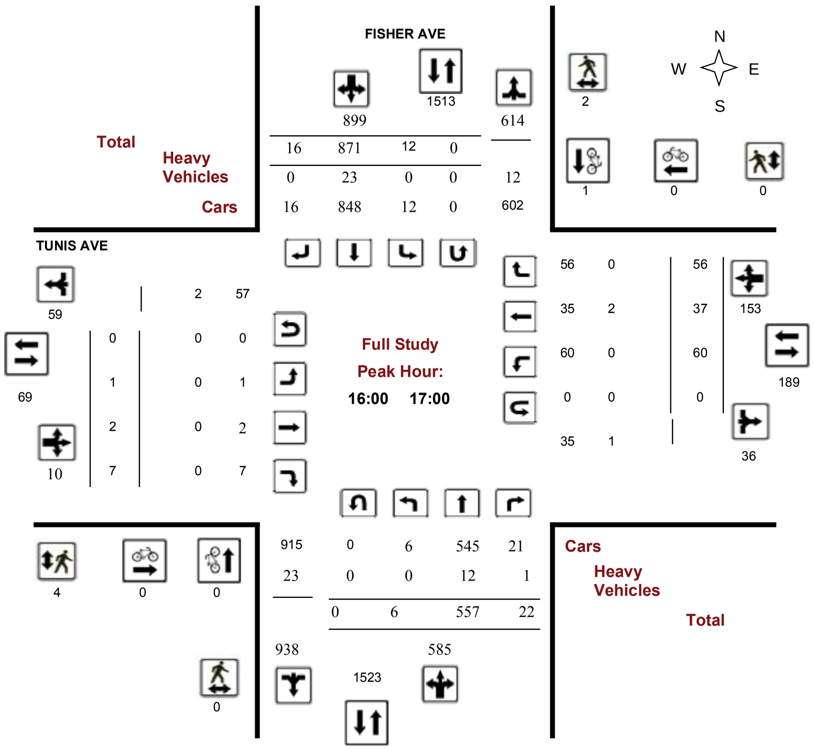
Comments

Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

FISHER AVE @ TUNIS AVE

Survey Date: Thursday, November 24, 2016 **WO No:** 36540
Start Time: 07:00 **Device:** Miovision



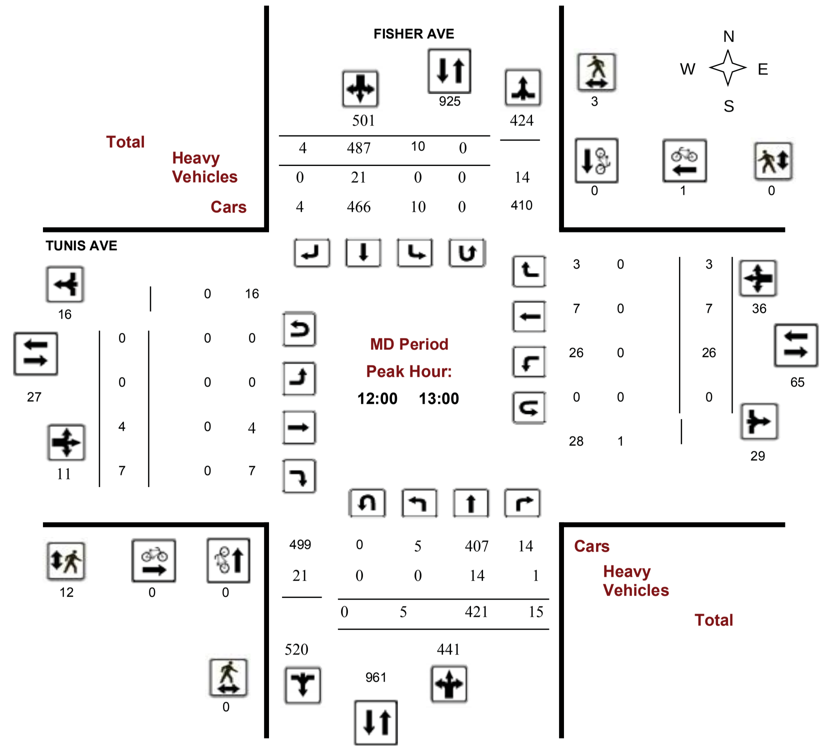
Comments

Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

FISHER AVE @ TUNIS AVE

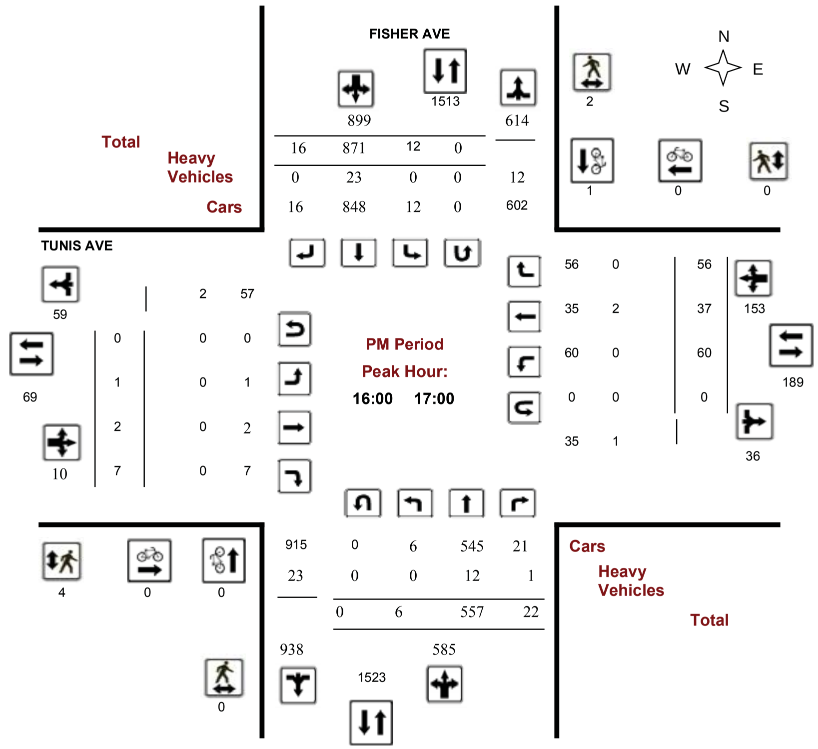
Survey Date: Thursday, November 24, 2016 **WO No:** 36540
Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services
Turning Movement Count - Full Study Peak Hour Diagram
FISHER AVE @ TUNIS AVE

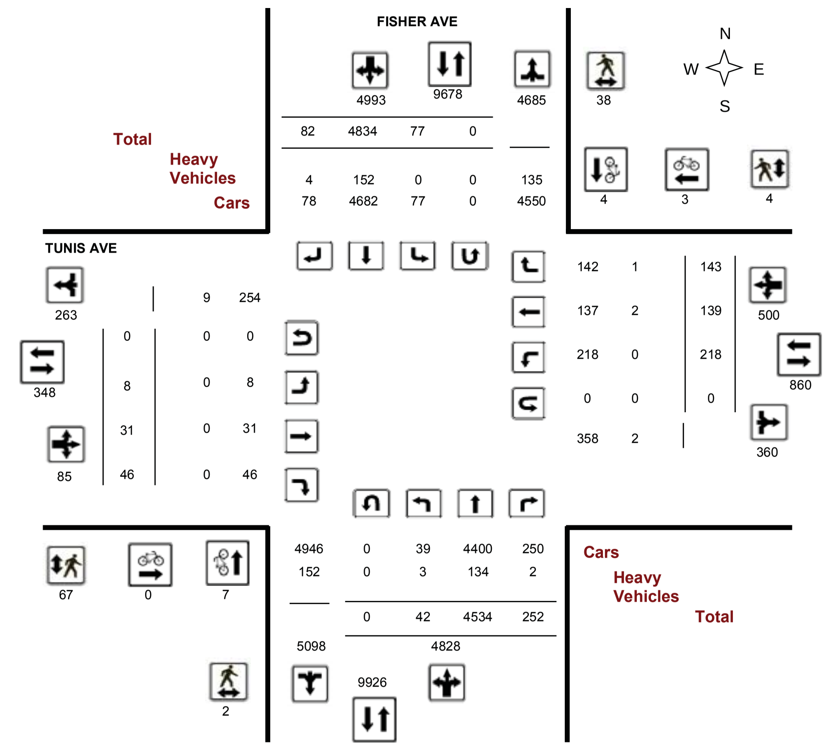
Survey Date: Thursday, November 24, 2016 **WO No:** 36540
Start Time: 07:00 **Device:** Miovision



Comments

Transportation Services - Traffic Services
Turning Movement Count - Full Study Diagram
FISHER AVE @ TUNIS AVE

Survey Date: Thursday, November 24, 2016 **WO#:** 36540
Device: Miovision



Comments

Transportation Services - Traffic Services

Work Order 36540

Turning Movement Count - Full Study Summary Report

FISHER AVE @ TUNIS AVE

Survey Date: Thursday, November 24, 2016

Total Observed U-Turns
Northbound: 0 Southbound: 0
Eastbound: 0 Westbound: 0

AADT Factor
.90

Full Study

	FISHER AVE									TUNIS AVE									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT	STR TOT	Grand Total
07:00 08:00	5	605	51	661	5	506	12	523	1184	1	3	5	9	6	8	3	17	26	1210
08:00 09:00	11	701	75	787	16	556	10	582	1369	1	9	10	20	14	5	12	31	51	1420
09:00 10:00	5	716	33	754	8	405	5	418	1172	3	4	7	14	15	12	11	38	52	1224
11:30 12:30	4	399	10	413	8	477	4	489	902	0	1	7	8	21	9	4	34	42	944
12:30 13:30	5	423	20	448	8	464	4	476	924	1	5	2	8	22	4	4	30	38	962
15:00 16:00	2	593	28	623	8	785	14	807	1430	0	4	5	9	35	28	19	82	91	1521
16:00 17:00	6	557	22	585	12	871	16	899	1484	1	2	7	10	60	37	56	153	163	1647
17:00 18:00	4	540	13	557	12	770	17	799	1356	1	3	3	7	45	36	34	115	122	1478
Sub Total	42	4534	252	**4828**	77	4834	82	**4993**	**9821**	8	31	46	**85**	218	139	143	**500**	**585**	**10406**
U Turns				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	42	4534	252	**4828**	77	4834	82	**4993**	**9821**	8	31	46	**85**	218	139	143	**500**	**585**	**10406**
EQ 12Hr	58	6302	350	**6711**	107	6719	114	**6940**	**13651**	11	43	64	**118**	303	193	199	**695**	**813**	**14464**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.													**1.39**						
AVG 12Hr	53	5672	315	**6040**	96	6047	103	**6246**	**12286**	10	39	58	**106**	273	174	179	**626**	**732**	**13018**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.													**.90**						
AVG 24Hr	69	7430	413	**7912**	126	7922	134	**8183**	**16095**	13	51	75	**139**	357	228	234	**819**	**958**	**17053**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.													**1.31**						

Comments:

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

Transportation Services - Traffic Services

W.O. 36540

Turning Movement Count - 15 Minute Summary Report

FISHER AVE @ TUNIS AVE

Survey Date: Thursday, November 24, 2016

Total Observed U-Turns
Northbound: 0 Southbound: 0
Eastbound: 0 Westbound: 0

	FISHER AVE									TUNIS AVE									
	Northbound				Southbound					Eastbound				Westbound					
Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00 07:15	0	126	7	**133**	3	106	0	**109**	**242**	0	1	1	**2**	1	1	0	**2**	**4**	**246**
07:15 07:30	1	155	12	**168**	1	135	5	**141**	**309**	0	0	0	**0**	0	3	1	**4**	**4**	**313**
07:30 07:45	1	146	9	**156**	0	129	3	**132**	**288**	0	1	2	**3**	4	2	1	**7**	**10**	**298**
07:45 08:00	3	178	23	**204**	1	136	4	**141**	**345**	1	1	2	**4**	1	2	1	**4**	**8**	**353**
08:00 08:15	1	160	14	**175**	3	134	7	**144**	**319**	0	5	3	**8**	1	1	4	**6**	**14**	**333**
08:15 08:30	6	164	25	**195**	3	152	2	**157**	**352**	0	0	0	**0**	6	1	3	**10**	**10**	**362**
08:30 08:45	3	203	18	**224**	2	136	0	**138**	**362**	1	2	2	**5**	3	0	3	**6**	**11**	**373**
08:45 09:00	1	174	18	**193**	8	134	1	**143**	**336**	0	2	5	**7**	4	3	2	**9**	**16**	**352**
09:00 09:15	0	191	16	**207**	2	113	3	**118**	**325**	2	1	1	**4**	4	4	4	**12**	**16**	**341**
09:15 09:30	3	211	9	**223**	2	109	0	**111**	**334**	0	2	1	**3**	6	3	4	**13**	**16**	**350**
09:30 09:45	0	160	5	**165**	2	84	1	**87**	**252**	0	0	1	**1**	5	3	1	**9**	**10**	**262**
09:45 10:00	2	154	3	**159**	2	99	1	**102**	**261**	1	1	4	**6**	0	2	2	**4**	**10**	**271**
11:30 11:45	0	108	0	**108**	5	120	1	**126**	**234**	0	0	1	**1**	2	0	1	**3**	**4**	**238**
11:45 12:00	2	107	2	**111**	0	117	1	**118**	**229**	0	0	0	**0**	9	4	2	**15**	**15**	**244**
12:00 12:15	1	95	3	**99**	0	115	1	**116**	**215**	0	0	3	**3**	6	1	0	**7**	**10**	**225**
12:15 12:30	1	89	5	**95**	3	125	1	**129**	**224**	0	1	3	**4**	4	4	1	**9**	**13**	**237**
12:30 12:45	2	130	1	**133**	3	109	0	**112**	**245**	0	0	1	**1**	8	1	1	**10**	**11**	**256**
12:45 13:00	1	107	6	**114**	4	138	2	**144**	**258**	0	3	0	**3**	8	1	1	**10**	**13**	**271**
13:00 13:15	0	93	7	**100**	1	100	1	**102**	**202**	1	1	0	**2**	1	1	2	**4**	**6**	**208**
13:15 13:30	2	93	6	**101**	0	117	1	**118**	**219**	0	1	1	**2**	5	1	0	**6**	**8**	**227**
15:00 15:15	0	126	6	**132**	3	185	3	**191**	**323**	0	2	1	**3**	7	2	2	**11**	**14**	**337**
15:15 15:30	0	158	9	**167**	1	206	5	**212**	**379**	0	1	1	**2**	11	9	6	**26**	**28**	**407**
15:30 15:45	2	171	11	**184**	3	202	3	**208**	**392**	0	1	2	**3**	4	2	4	**10**	**13**	**405**
15:45 16:00	0	138	2	**140**	1	192	3	**196**	**336**	0	0	1	**1**	13	15	7	**35**	**36**	**372**
16:00 16:15	2	166	4	**172**	2	223	0	**225**	**397**	0	2	3	**5**	11	7	16	**34**	**39**	**436**
16:15 16:30	1	141	7	**149**	5	205	4	**214**	**363**	0	0	1	**1**	15	13	12	**40**	**41**	**404**
16:30 16:45	1	134	6	**141**	1	234	8	**243**	**384**	1	0	2	**3**	19	7	11	**37**	**40**	**424**
16:45 17:00	2	116	5	**123**	4	209	4	**217**	**340**	0	0	1	**1**	15	10	17	**42**	**43**	**383**
17:00 17:15	1	155	2	**158**	3	205	6	**214**	**372**	0	1	1	**2**	18	11	10	**39**	**41**	**413**
17:15 17:30	1	125	6	**132**	3	205	2	**210**	**342**	0	1	2	**3**	10	13	11	**34**	**37**	**379**
17:30 17:45	1	115	1	**117**	4	185	4	**193**	**310**	0	1	0	**1**	14	6	8	**28**	**29**	**339**
17:45 18:00	1	145	4	**150**	2	175	5	**182**	**332**	1	0	0	**1**	3	6	5	**14**	**15**	**347**
TOTAL:	42	4534	252	**4828**	77	4834	82	**4993**	**9821**	8	31	46	**85**	218	139	143	**500**	**585**	**10406**

Note: U-Turns are included in Totals.

Comment:

Transportation Services - Traffic Services
Turning Movement Count - Cyclist Volume Report

Work Order
36540

FISHER AVE @ TUNIS AVE

Count Date: Thursday, November 24, 2016 **Start Time:** 07:00

	FISHER AVE			TUNIS AVE			
Time Period	Northbound	Southbound	**Street Total**	Eastbound	Westbound	**Street Total**	**Grand Total**
07:00 08:00	4	1	**5**	0	0	**0**	**5**
08:00 09:00	1	1	**2**	0	0	**0**	**2**
09:00 10:00	1	1	**2**	0	0	**0**	**2**
11:30 12:30	0	0	**0**	0	1	**1**	**1**
12:30 13:30	0	0	**0**	0	0	**0**	**0**
15:00 16:00	0	0	**0**	0	0	**0**	**0**
16:00 17:00	0	1	**1**	0	0	**0**	**1**
17:00 18:00	1	0	**1**	0	2	**2**	**3**
Total	7	4	**11**	0	3	**3**	**14**

Comment:

Note: These volumes consists of bicycles only (no mopeds or motorcycles) and ARE NOT included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

W.O.
36540

Turning Movement Count - Heavy Vehicle Report

FISHER AVE @ TUNIS AVE

Survey Date: Thursday, November 24, 2016

	FISHER AVE									TUNIS AVE									
	Northbound				Southbound					Eastbound				Westbound					
Time Period	LT	ST	RT	**N TOT**	LT	ST	RT	**S TOT**	**STR TOT**	LT	ST	RT	**E TOT**	LT	ST	RT	**W TOT**	**STR TOT**	**Grand Total**
07:00 08:00	0	21	0	**21**	0	12	1	**13**	**34**	0	0	0	**0**	0	0	0	**0**	**0**	**34**
08:00 09:00	3	22	0	**25**	0	16	1	**17**	**42**	0	0	0	**0**	0	0	0	**0**	**0**	**42**
09:00 10:00	0	20	0	**20**	0	20	0	**20**	**40**	0	0	0	**0**	0	0	0	**0**	**0**	**40**
11:30 12:30	0	15	0	**15**	0	14	0	**14**	**29**	0	0	0	**0**	0	0	0	**0**	**0**	**29**
12:30 13:30	0	15	1	**16**	0	25	0	**25**	**41**	0	0	0	**0**	0	0	1	**1**	**1**	**42**
15:00 16:00	0	17	0	**17**	0	20	1	**21**	**38**	0	0	0	**0**	0	0	0	**0**	**0**	**38**
16:00 17:00	0	12	1	**13**	0	23	0	**23**	**36**	0	0	0	**0**	0	2	0	**2**	**2**	**38**
17:00 18:00	0	12	0	**12**	0	22	1	**23**	**35**	0	0	0	**0**	0	0	0	**0**	**0**	**35**
Sub Total	3	134	2	**139**	0	152	4	**156**	**295**	0	0	0	**0**	0	2	1	**3**	**3**	**298**
U-Turns (Heavy Vehicles)				**0**				**0**	**0**				**0**				**0**	**0**	**0**
Total	3	134	2	**0**	0	152	4	**156**	**295**	0	0	0	**0**	0	2	1	**3**	**3**	**298**

Heavy Vehicles include Buses, Single-Unit Trucks and Articulated Trucks. Further, they ARE included in the Turning Movement Count Summary.

Transportation Services - Traffic Services

Work Order 36540

Turning Movement Count - Pedestrian Volume Report

FISHER AVE @ TUNIS AVE

Count Date: Thursday, November 24, 2016 **Start Time:** 07:00

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	1	2	3	1	0	1	4
07:15 07:30	1	3	4	2	0	2	6
07:30 07:45	0	3	3	1	1	2	5
07:45 08:00	0	3	3	2	0	2	5
07:00 08:00	2	11	13	6	1	7	20
08:00 08:15	0	4	4	3	0	3	7
08:15 08:30	0	2	2	1	0	1	3
08:30 08:45	0	1	1	7	1	8	9
08:45 09:00	0	2	2	0	0	0	2
08:00 09:00	0	9	9	11	1	12	21
09:00 09:15	0	2	2	1	0	1	3
09:15 09:30	0	2	2	4	0	4	6
09:30 09:45	0	1	1	0	0	0	1
09:45 10:00	0	0	0	2	0	2	2
09:00 10:00	0	5	5	7	0	7	12
11:30 11:45	0	0	0	1	0	1	1
11:45 12:00	0	0	0	1	1	2	2
12:00 12:15	0	1	1	4	0	4	5
12:15 12:30	0	0	0	6	0	6	6
11:30 12:30	0	1	1	12	1	13	14
12:30 12:45	0	2	2	0	0	0	2
12:45 13:00	0	0	0	2	0	2	2
13:00 13:15	0	0	0	3	0	3	3
13:15 13:30	0	1	1	4	0	4	5
12:30 13:30	0	3	3	9	0	9	12
15:00 15:15	0	1	1	1	0	1	2
15:15 15:30	0	1	1	0	0	0	1
15:30 15:45	0	2	2	3	0	3	5
15:45 16:00	0	0	0	1	0	1	1
15:00 16:00	0	4	4	5	0	5	9
16:00 16:15	0	1	1	0	0	0	1
16:15 16:30	0	1	1	4	0	4	5
16:30 16:45	0	0	0	0	0	0	0
16:45 17:00	0	0	0	0	0	0	0
16:00 17:00	0	2	2	4	0	4	6
17:00 17:15	0	1	1	2	0	2	3
17:15 17:30	0	0	0	4	0	4	4
17:30 17:45	0	2	2	2	1	3	5
17:45 18:00	0	0	0	5	0	5	5
17:00 18:00	0	3	3	13	1	14	17
Total	2	38	40	67	4	71	111

Comment:

Transportation Services - Traffic Services

Work Order 36540

Turning Movement Count - 15 Min U-Turn Total Report

FISHER AVE @ TUNIS AVE

Survey Date: Thursday, November 24, 2016

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	0	0	0	0	0
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	0	0
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	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
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		0	0	0	0	0

Appendix B

SYNCHRO Analysis: Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	5	8	17	8	12	10	747	77	15	546	6
Future Volume (Veh/h)	3	5	8	17	8	12	10	747	77	15	546	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	3	6	9	19	9	13	11	830	86	17	607	7
Pedestrians		9			1						7	
Lane Width (m)		3.7			3.7						3.7	
Walking Speed (m/s)		1.0			1.0						1.0	
Percent Blockage		1			0						1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								329				
pX, platoon unblocked	0.74	0.74		0.74	0.74	0.74				0.74		
vC, conflicting volume	1573	1592	620	1552	1553	881	623			917		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1599	1625	620	1571	1572	661	623			710		
tC, single (s)	*6.1	*5.5	*5.2	*6.1	*5.5	*5.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	95	98	80	93	97	99			97		
cM capacity (veh/h)	86	114	579	94	121	410	944			652		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	18	41	927	631
Volume Left	3	19	11	17
Volume Right	9	13	86	7
cSH	175	133	944	652
Volume to Capacity	0.10	0.31	0.01	0.03
Queue Length 95th (m)	2.6	9.2	0.3	0.6
Control Delay (s)	27.9	43.7	0.3	0.7
Lane LOS	D	E	A	A
Approach Delay (s)	27.9	43.7	0.3	0.7
Approach LOS	D	E		

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

* User Entered Value

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	52	28	25	746	471	17
Future Volume (vph)	52	28	25	746	471	17
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	33.0	0.0	37.5			25.0
Storage Lanes	1	1	1			1
Taper Length (m)	40.0		80.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	0.95	1.00			0.97
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1679	1502	1679	1732	1715	1488
Flt Permitted	0.950		0.455			
Satd. Flow (perm)	1645	1433	801	1732	1715	1444
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		31				18
Link Speed (k/h)	50			50	50	
Link Distance (m)	372.5			338.3	329.3	
Travel Time (s)	26.8			24.4	23.7	
Confl. Peds. (#/hr)	10	3	7			7
Confl. Bikes (#/hr)		14				
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	4%	4%
Bus Blockages (#/hr)	0	0	0	5	5	0
Adj. Flow (vph)	58	31	28	829	523	19
Shared Lane Traffic (%)						
Lane Group Flow (vph)	58	31	28	829	523	19
Turn Type	Perm	Perm	Perm	NA	NA	Perm
Protected Phases				2	6	
Permitted Phases	4	4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.0	26.0	54.0	54.0	54.0	54.0
Total Split (s)	26.0	26.0	54.0	54.0	54.0	54.0
Total Split (%)	32.5%	32.5%	67.5%	67.5%	67.5%	67.5%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	8.3	8.3	64.0	64.0	64.0	64.0
Actuated g/C Ratio	0.10	0.10	0.80	0.80	0.80	0.80
v/c Ratio	0.34	0.18	0.04	0.60	0.38	0.02
Control Delay	38.0	14.4	3.1	6.8	4.3	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	14.4	3.1	6.8	4.3	1.5

Lanes, Volumes, Timings
2: Fisher & Shillington

3/2/2017

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
LOS	D	B	A	A	A	A
Approach Delay	29.8			6.7	4.2	
Approach LOS	C			A	A	
Queue Length 50th (m)	8.4	0.0	0.8	44.4	21.0	0.0
Queue Length 95th (m)	18.4	7.2	2.9	87.9	40.6	1.5
Internal Link Dist (m)	348.5			314.3	305.3	
Turn Bay Length (m)	33.0		37.5			25.0
Base Capacity (vph)	421	390	640	1386	1372	1159
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.08	0.04	0.60	0.38	0.02

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 33 (41%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 7.2 — Intersection LOS: A
Intersection Capacity Utilization 56.0% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 2: Fisher & Shillington

HCM Unsignalized Intersection Capacity Analysis
1: Fisher & Tunis

3/2/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	2	7	61	37	57	6	568	22	12	888	16
Future Volume (Veh/h)	1	2	7	61	37	57	6	568	22	12	888	16
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	2	8	68	41	63	7	631	24	13	987	18
Pedestrians		4									2	
Lane Width (m)		4.8									3.3	
Walking Speed (m/s)		1.0									1.0	
Percent Blockage		1									0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)								329				
pX, platoon unblocked	0.91	0.91		0.91	0.91	0.91				0.91		
vC, conflicting volume	1768	1695	1000	1688	1692	645	1009			655		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1795	1715	1000	1707	1711	559	1009			570		
tC, single (s)	*6.1	*5.5	*5.2	*6.1	*5.5	*5.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	98	98	32	68	89	99			99		
cM capacity (veh/h)	61	129	391	100	130	562	683			911		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	11	172	662	1018
Volume Left	1	68	7	13
Volume Right	8	63	24	18
cSH	211	156	683	911
Volume to Capacity	0.05	1.11	0.01	0.01
Queue Length 95th (m)	1.2	69.4	0.2	0.3
Control Delay (s)	23.0	161.9	0.3	0.4
Lane LOS	C	F	A	A
Approach Delay (s)	23.0	161.9	0.3	0.4
Approach LOS	C	F		

Intersection Summary

Average Delay: 15.4
Intersection Capacity Utilization: 80.9% — ICU Level of Service: D
Analysis Period (min): 15

* User Entered Value

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	36	42	46	559	751	75
Future Volume (vph)	36	42	46	559	751	75
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.97	0.95	1.00			0.96
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1637	1464	1605	1656	1656	1436
Flt Permitted	0.950		0.301			
Satd. Flow (perm)	1584	1395	507	1656	1656	1377
Satd. Flow (RTOR)		47				49
Confl. Peds. (#/hr)	15	11	9			9
Confl. Bikes (#/hr)		3				15
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	1%	1%	3%	3%	3%	3%
Bus Blockages (#/hr)	0	0	0	5	5	0
Adj. Flow (vph)	40	47	51	621	834	83
Shared Lane Traffic (%)						
Lane Group Flow (vph)	40	47	51	621	834	83
Turn Type	Perm	Perm	Perm	NA	NA	Perm
Protected Phases				2	6	
Permitted Phases	4	4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.0	26.0	59.0	59.0	59.0	59.0
Total Split (s)	26.0	26.0	59.0	59.0	59.0	59.0
Total Split (%)	30.6%	30.6%	69.4%	69.4%	69.4%	69.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	7.7	7.7	69.6	69.6	69.6	69.6
Actuated g/C Ratio	0.09	0.09	0.82	0.82	0.82	0.82
v/c Ratio	0.28	0.28	0.12	0.46	0.62	0.07
Control Delay	40.4	15.3	3.4	4.5	6.6	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.4	15.3	3.4	4.5	6.6	1.5
LOS	D	B	A	A	A	A
Approach Delay	26.8			4.5	6.1	
Approach LOS	C			A	A	
Queue Length 50th (m)	6.2	0.0	1.5	26.3	44.5	0.9
Queue Length 95th (m)	15.0	9.3	4.8	50.0	87.9	4.0
Internal Link Dist (m)	348.5			314.3	305.3	
Turn Bay Length (m)	33.0		37.5			25.0
Base Capacity (vph)	382	372	415	1356	1356	1136

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.13	0.12	0.46	0.62	0.07

Intersection Summary

Cycle Length: 85
Actuated Cycle Length: 85
Offset: 15 (18%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.62
Intersection Signal Delay: 6.5 Intersection LOS: A
Intersection Capacity Utilization 58.9% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 2: Fisher & Shillington