Memo

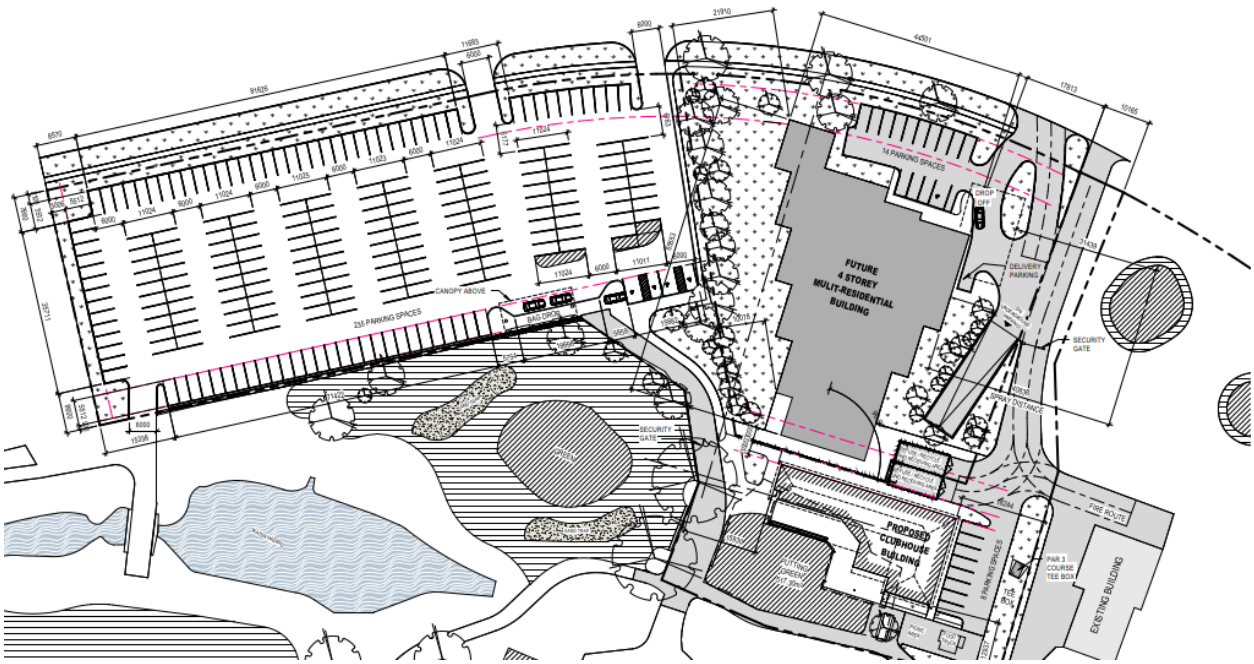
To: Joe Baker, The Corporation of the City of Windsor
From: Mike Walters, Dillon Consulting Limited (Dillon)
cc: Rukma Ramdenee (Dillon)
Date: March 20, 2026
Subject: Roseland Golf Club Residential Development - Traffic Brief
Our File: 26-XXXX

Introduction

Dillon Consulting Limited (Dillon) has been retained by The Corporation of the City of Windsor (the "City") to prepare a traffic brief in support of a proposed residential development on the grounds of the Roseland Golf Club in Windsor, Ontario. At present, the "northern part" of the site (fronting onto Kennedy Drive) contains a parking lot and a building which serves as the clubhouse and curling facilities for the Roseland Golf & Curling Club. That building will be demolished. In its place, the new development will feature a four-storey, 44-unit residential building. Additionally, a new clubhouse will be constructed to serve the golf club, which will continue operating.

Figure 1 illustrates the conceptual development plan.

Figure 1: Conceptual Development Plan



The full conceptual development plan is also provided in **Attachment 1**.

Scope

This traffic brief:

- identifies the expected traffic volumes that would be generated by the residential development and the golf course during peak times;
- estimates the distribution of traffic that would be generated by the residential development and the golf course, based on the configuration of the adjacent roadway; and
- summarizes the impact of the proposed development on the adjacent road network.

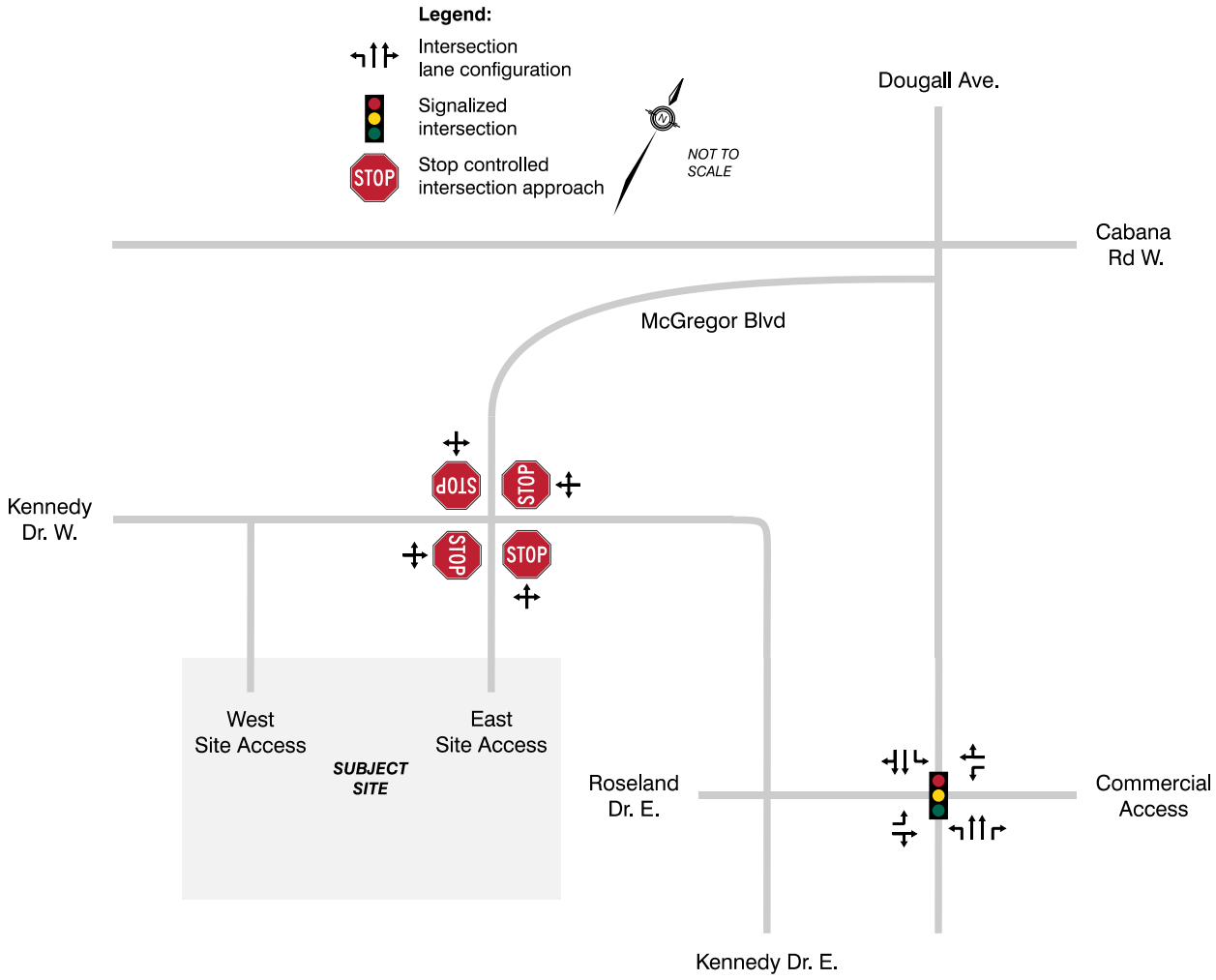
Existing and future traffic conditions were assessed at:

- Kennedy Drive and McGregor Boulevard / East Site Access; and
- Dougall Avenue and Roseland Drive East / Commercial Access.

Existing Development

As noted previously, the site is currently occupied by the Roseland Golf & Curling Club. Two accesses along Kennedy Drive West connect to a single, shared parking area. **Figure 2** illustrates the existing traffic control and lane configuration at the study area intersections.

Figure 2: Existing Control Geometry and Traffic Control



Existing Conditions

Existing Traffic Volumes

Weekday AM and PM peak hour intersection turning movement counts were undertaken on March 20, 2023 at the Dougall Avenue and Roseland Drive East / Commercial Access intersection. Traffic counts were completed by Ontario Traffic Inc. (OTI) on behalf of the City. Existing (2026) volumes were calculated by applying a background growth rate of 2% per year to the March 2023 volumes at the Dougall Avenue and Roseland Drive East / Commercial Access intersection. The growth rate was determined based on typical rates, as well as previous growth rates used in recent traffic impact studies in the Windsor-Essex area. The growth rate was applied to all movements, except for movements to/from the commercial plaza as this is not through roadway which would be subjected to increases in through traffic due to growth outside the study area. Growth applied to the west leg of the intersection represents a conservative approach.

Traffic volumes at the Kennedy Drive and McGregor Boulevard / East Site Access intersection were collected by Dillon on March 17, 2026. At the time of data collection, the south leg of the intersection was closed. Furthermore, as golf course activity typically peaks during the summer months, golf course related trips were estimated and added to the existing volumes to reflect peak seasonal conditions.

Golf Course Trip Generation and Assignment

The existing 18-hole golf course is accessed from Kennedy Drive via two driveways: an eastern driveway (which forms the south leg of the Kennedy Drive and McGregor Boulevard / East Site Access intersection) and a western driveway approximately 125 metres west of the Kennedy Drive and McGregor Boulevard / East Site Access intersection.

Trips generated by the golf course were estimated based on trip generation rates published by the Institute of Transportation Engineers (ITE) in their document *Trip Generation Manual*, 11th edition. The trips generated by the golf course were estimated using trip rates associated with ITE land use code 430 ("Golf Course"). Both the average rate and the fitted curve equation (where available) were considered. To provide a conservative assessment, the method resulting in the higher trip generation estimate was selected. The referenced ITE pages are provided in **Attachment 2**.

Table 1: Trip Generation

Land use / magnitude	AM peak hour					PM peak hour				
	Rate	% in/ out	Total trips	Trips in	Trips out	Rate	% in/ out	Total trips	Trips in	Trips out
Trip Generation										
Golf Course *(18-Holes)*	[1]	79 / 21	32	25	7	[1]	53 / 47	52	28	24

[1] AM: 1.76(X); PM: 2.91(X)

The golf course is anticipated to generate 32 vehicle trips (25 inbound, 7 outbound) during the weekday AM peak hour, and 52 vehicle trips (28 inbound, 24 outbound) during the weekday PM peak hour.

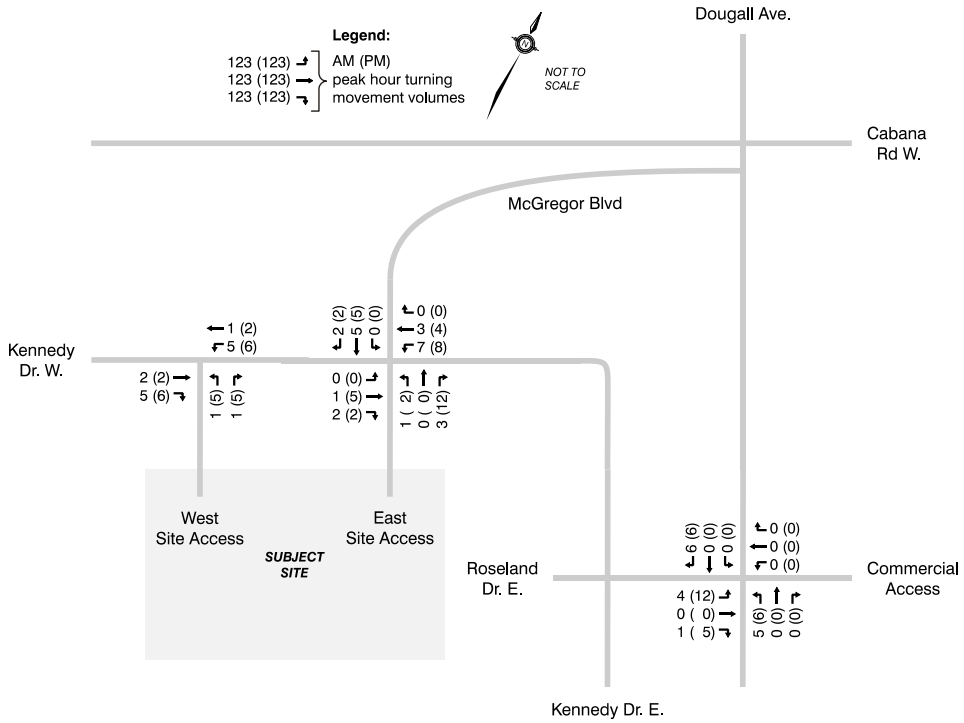
The vehicles generated by the golf course were distributed to the road network based on existing travel patterns and the attractiveness of various travel routes, as well as the site's anticipated catchment area.

The following trip distribution was used for both peak hours:

- 45% to/from the north via Dougall Avenue;
- 20% to/from the east via Cabana Road West;
- 15% to/from the west via Cabana Road West; and
- 20% to/from the south via Dougall Avenue.

The golf course trips were assigned to the two existing site driveways based on the direction of their approach. **Figure 3** illustrates how the vehicle trips generated by the golf course were distributed and assigned through the study area intersections. Some movements do not balance due to rounding.

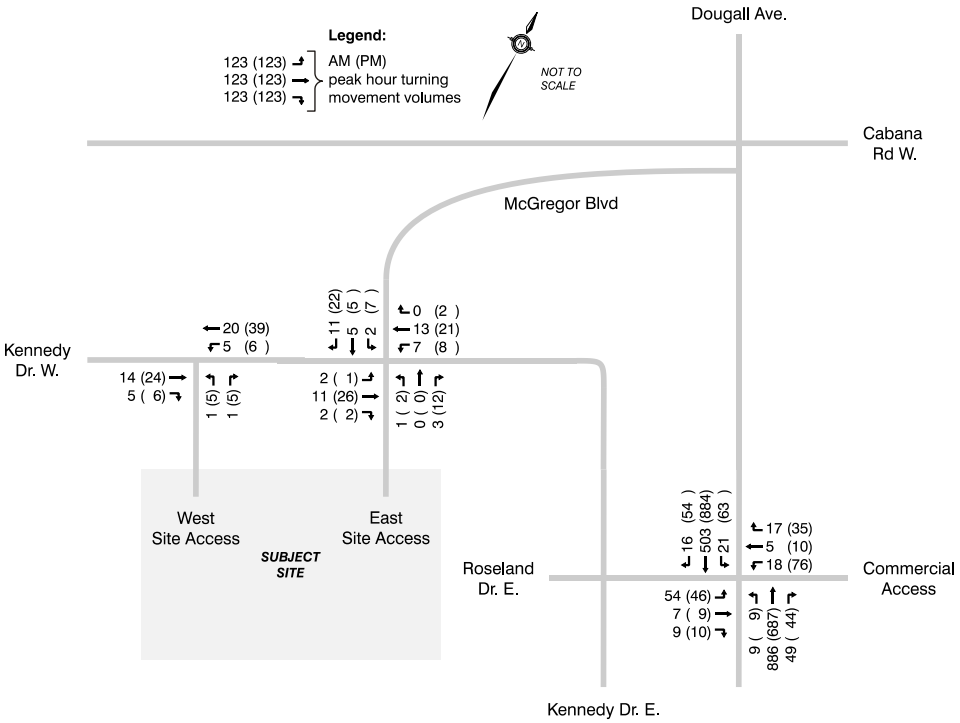
Figure 3: Site-Generated Trips (Golf Course)



Baseline Traffic Volumes

The baseline traffic volumes were calculated by adding the golf course trips to the existing traffic volumes. The baseline weekday AM and PM peak hour traffic volumes for the study area intersections are presented in **Figure 4**. The detailed turning movement count data are provided in **Attachment 3**.

Figure 4: Baseline Traffic Volumes (2026)



Baseline Intersection Operations

Intersection operational analyses were completed for the study area intersections using Trafficware's Synchro software (version 12). At the study area intersections, the volume-to-capacity (v/c) ratio, delay, level of service and 95th percentile queue was noted for any stop-controlled movements or for any movements where an exclusive left-turn lane is present. Level of service (LOS) definitions are provided in **Attachment 4**. The Synchro analysis worksheets reports are provided in **Attachment 5**.

At each intersection, critical movements were identified. Critical movements are defined by the City of Windsor as:

- Any individual movement at a signalized intersection operating at a v/c ratio of 0.85 or greater;
- An exclusive turning movement at a signalized intersection operating at a v/c ratio of 1.0 or greater;
- Any individual movement at a signalized intersection operating at LOS F;
- Any individual movement at an unsignalized intersection operating at LOS E or worse; and
- Any turning movement where the calculated 95th percentile queue exceeds the available storage length.

The analyses reflect the existing lane configurations and traffic signal timings (**Attachment 3**) obtained from the City of Windsor.

Table 2 summarizes the baseline intersection operations for the Dougall Avenue and Roseland Drive East / Commercial Access intersection.

Table 2: Baseline Intersection Operations — Dougall Avenue & Roseland Dr E/Commercial Access

Movement	AM peak hour				PM peak hour			
	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*
Existing								
EB left	0.33	D	43.8	20	0.35	D	50.9	22
EB through/right	0.08	C	23.8	7	0.11	C	28.6	9
WB left	0.11	D	37.6	9	0.51	E	56.3	32
WB through/right	0.10	B	18.9	7	0.22	B	20.0	13
NB left	0.02	A	4.1	2	0.03	A	3.1	2
NB through	0.33	A	4.1	50	0.25	A	3.0	28
NB right	0.04	A	1.4	4	0.04	A	1.0	2
SB left	0.06	A	4.4	4	0.13	A	3.6	7
SB through/right	0.20	A	3.5	27	0.35	A	3.4	42
Overall	**—**	**A**	**6.0**	**—**	**—**	**A**	**7.1**	**—**

The Dougall Avenue and Roseland Drive East / Commercial Access intersection is currently operating at a good overall level of service (LOS A) during both peak hours, with no critical movements. During the PM peak hour, the westbound left-turn movement operates at a poor level of service (LOS E) but remains well under capacity with a v/c ratio of 0.55. No delay or queuing issues are anticipated.

Table 3 summarizes the baseline intersection operations for the Kennedy Drive and McGregor Boulevard / East Site Access intersection.

Table 3: Baseline Intersection Operations — Kennedy Dr E & McGregor Blvd/East Site Access

Movement	AM peak hour				PM peak hour			
	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*
Existing								
EB approach	0.02	A	7.0	1	0.04	A	7.1	1
WB approach	0.03	A	7.2	1	0.04	A	7.2	1
NB approach	0.00	A	6.6	0	0.02	A	6.6	0
SB approach	0.02	A	6.8	1	0.04	A	6.9	1

The all-way stop-controlled Kennedy Drive and McGregor Boulevard / East Site Access intersection is currently operating at LOS A on each approach, with minimal vehicle delays.

Future Conditions

Proposed Development

Under the proposed development plan, the existing building on site will be demolished and a 4-storey, 44-unit multifamily residential building is proposed in its place. Additionally, a new clubhouse will be constructed to serve the golf course.

Per the development plan, three site accesses are envisioned. The existing east access will be repurposed as a dedicated driveway for the residential building. Two accesses (located to the west) will serve the golf course parking lot, as illustrated in the conceptual development plan (**Figure 1)**.

For the purposes of this analysis, the two proposed golf course accesses have been modelled as a single consolidated access point, since their traffic assignments and operations analyses are outside the scope of this assessment. This simplification does not impact the operational analysis of the residential development.

Residential Site Trip Generation

The residential development is proposed to have 44 dwelling units. The proposed access is the existing south leg of the Kennedy Drive and McGregor Boulevard intersection.

Trips generated by the proposed residential development were estimated based on trip generation rates contained within the *Trip Generation Manual*, 11th edition. The trips generated by the development were estimated using trip rates associated with ITE land use code 221 ("Multifamily Housing (Mid-Rise)"). Both the average rate and the fitted curve equation (where available) were considered; to provide a conservative assessment, the method resulting in the higher trip generation estimate was selected. The referenced ITE pages are provided in **Attachment 2**.

Table 4 summarizes the number of vehicle trips that are expected to be generated by the residential development.

Table 4: Residential Development Vehicle Trip Generation

Land use / magnitude	AM peak hour					PM peak hour				
	Rate	% in/ out	Total trips	Trips in	Trips out	Rate	% in/ out	Total trips	Trips in	Trips out
Multifamily Housing (Mid-Rise)										
44 Dwelling Units	[1]	23 / 77	16	4	12	[1]	61 / 39	18	11	7

[1] AM: 0.37(X); PM: 0.39(X) + 0.34

The proposed development is anticipated to generate 16 vehicle trips (4 inbound, 12 outbound) during the weekday AM peak hour, and 18 vehicle trips (11 inbound, 7 outbound) during the weekday PM peak hour.

Residential Site Trip Distribution

The vehicles generated by the proposed development were distributed to the road network based on existing travel patterns and the attractiveness of various travel routes.

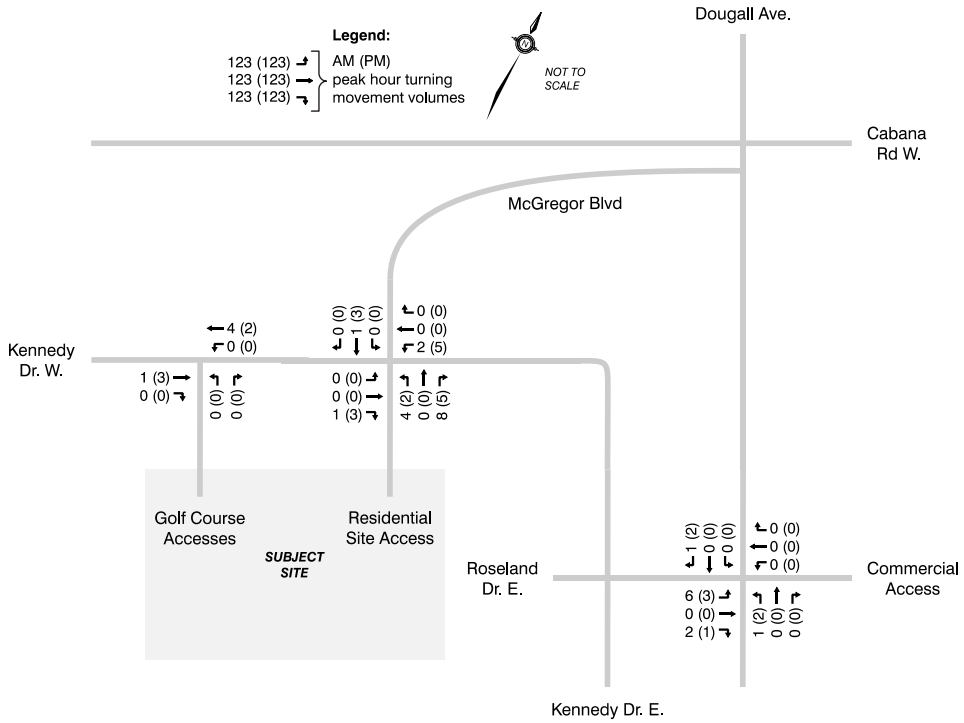
The following trip distribution was used for both peak hours:

- 35% to/from the north via Dougall Avenue;
- 25% to/from the east via Cabana Road West;
- 20% to/from the west via Cabana Road West; and
- 20% to/from the south via Dougall Avenue.

Residential Site Trip Assignment

Figure 5 illustrates how the vehicle trips generated by the residential development were distributed and assigned through the study area intersections. Some movements do not balance due to rounding.

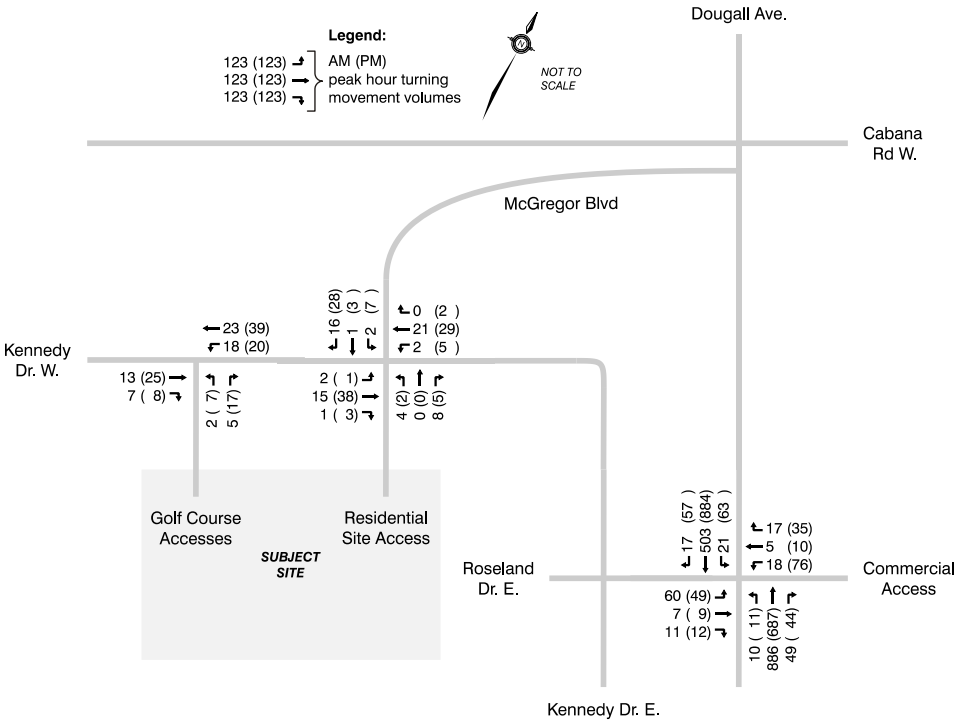
Figure 5: Site-Generated Trips (Residential Development)



Future Volumes

The total future traffic volumes were calculated by re-assigning all the golf course trips to the west driveway (the "Golf Course Access") and adding the residential site trips to the existing 2026 traffic volumes. The total future traffic volumes are presented in **Figure 6**.

Figure 6: Total Future Volumes



Future Intersection Operations

Consistent with the existing conditions analysis, future traffic volumes were evaluated using Synchro 12. The identification of critical movements and the calculation of operational metrics (LOS, delay, v/c, and queuing) adhere entirely to the City of Windsor parameters established in the *Baseline Intersection Operations* section. For the purposes of this analysis, the existing lane configurations and traffic signal timings were assumed to remain unchanged.

Table 5 summarizes the future intersection operations for the Dougall Avenue and Roseland Drive East / Commercial Access intersection.

Table 5: Future Intersection Operations — Dougall Avenue & Roseland Dr E/Commercial Access

Movement	AM peak hour				PM peak hour			
	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*
Future								
EB left	0.37	D	44.6	22	0.37	D	51.7	23
EB through/right	0.08	C	22.6	7	0.12	C	27.1	9
WB left	0.10	D	37.3	9	0.51	E	56.4	32
WB through/right	0.10	B	18.8	7	0.22	B	20.0	13
NB left	0.02	A	4.2	2	0.03	A	3.2	2
NB through	0.33	A	4.2	50	0.25	A	3.0	28
NB right	0.04	A	1.4	4	0.04	A	1.0	2
SB left	0.06	A	4.5	4	0.13	A	3.6	7
SB through/right	0.20	A	3.6	27	0.35	A	3.4	42
Overall	—	**A**	**6.2**	—	—	**A**	**7.2**	—

With the residential development in place, negligible changes to operations will occur. The Dougall Avenue and Roseland Drive East / Commercial Access intersection is projected to continue to operate at LOS A during both peak hours, without any critical movements. No delay or queuing issues are anticipated.

Table 6 summarizes the future intersection operations for the Kennedy Drive and McGregor Boulevard / Residential Site Access intersection.

Table 6: Future Intersection Operations — Kennedy Dr E & McGregor Blvd/Residential Site Access

Movement	AM peak hour				PM peak hour			
	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*	v/c	LOS	Delay *(s/veh)*	95th %ile queue *(m)*
Future								
EB approach	0.03	A	7.1	1	0.05	A	7.2	2
WB approach	0.04	A	7.2	1	0.04	A	7.2	1
NB approach	0.02	A	6.8	0	0.01	A	6.8	0
SB approach	0.02	A	6.6	1	0.04	A	6.8	1

With the residential development in place, negligible changes to operations will occur. The all-way stop-controlled Kennedy Drive and McGregor Boulevard / East Site Access intersection is anticipated to continue to operate at LOS A on each approach, with minimal delays. The increase in traffic from the residential development results in negligible changes to operations.

Anticipated Impacts

The proposed residential development is expected to have a negligible impact on the surrounding road network. As shown in **Table 1**, the 44-unit residential building is projected to generate 16 net vehicle trips (4 inbound, 12 outbound) during the AM peak hour and 18 trips (11 inbound, 7 outbound) during the PM peak hour.

The increase in traffic to Dougall Avenue and Roseland Drive East / Commercial Access intersection will be minimal, as seen in **Figure 5**. Site-generated traffic is anticipated to increase the volume of eastbound left-turns by six trips in the AM peak hour and three trips in the PM peak hour. Under existing conditions, the queue lengths for this movement are 20 metres and 22 metres in the AM and PM peak hours, respectively. With the addition of site-generated traffic, these queues are projected to reach 22 and 23 metres, representing a negligible increase that remains well within the available storage length.

The intersections of Dougall Avenue and Roseland Drive East / Commercial Access and Roseland Road East and Kennedy Road East are spaced approximately 70 metres apart. The future projected queues remain within the available throat length (i.e., distance between intersections) and should have no impact on downstream intersection operations.

In general, the volume of site-generated traffic added to the study area intersections is minimal. No operational impacts are anticipated from the addition of residential traffic, and the performance of surrounding intersections is expected to remain relatively unchanged.

Summary and Recommendations

Dillon Consulting Limited (Dillon) has been retained by The Corporation of the City of Windsor (the "City") to prepare a traffic brief in support of a proposed residential development on the grounds of the Roseland Golf Club in Windsor, Ontario.

At present, the "northern part" of the site (fronting onto Kennedy Drive) contains a parking lot and a building which serves as the clubhouse and curling facilities for the Roseland Golf & Curling Club. That building will be demolished. In its place, the new development will feature a four-storey, 44-unit residential building. Additionally, a new clubhouse will be constructed to serve the golf club, which will continue operating.

At present, two accesses along Kennedy Drive West connect to a single, shared parking area to access the site. With the redevelopment, three site accesses are proposed. The existing east access will be repurposed as the dedicated driveway for the residential building. Two accesses will exclusively serve the golf course parking lot.

Based on published ITE trip generation data, the proposed residential development is anticipated to generate 16 vehicle trips (4 inbound, 12 outbound) during the weekday AM peak hour, and 18 vehicle trips (11 inbound, 7 outbound) during the weekday PM peak hour.

The Dougall Avenue and Roseland Drive East / Commercial Access intersection is currently operating at a good overall level of service (LOS A) during both peak hours, with no critical movements. No delay or queuing issues are anticipated.

The all-way stop-controlled Kennedy Drive and McGregor Boulevard / East Site Access intersection is currently operating at LOS A on each approach, with minimal vehicle delays.

The proposed residential development is expected to have a negligible impact on the surrounding road network. The performance of the study area intersections is expected to remain relatively unchanged. No critical movements or operational issues arise from the proposed development.

Yours sincerely,
DILLON CONSULTING LIMITED

Mike Walters, P.Eng.
Transportation Engineer

Attachment 1:

Conceptual Development Plan

SITE LEGEND

- LANDSCAPING (SEE LANDSCAPE DRAWINGS)
- CONCRETE SURFACE
- BARRIER FREE BUILDING ENTRANCE
- ASPHALT SURFACE
- NEW BUILDING COVERAGE
- BUILDING ENTRANCE
- EXISTING BUILDING COVERAGE
- PROPERTY LINE
- PROPERTY LINE

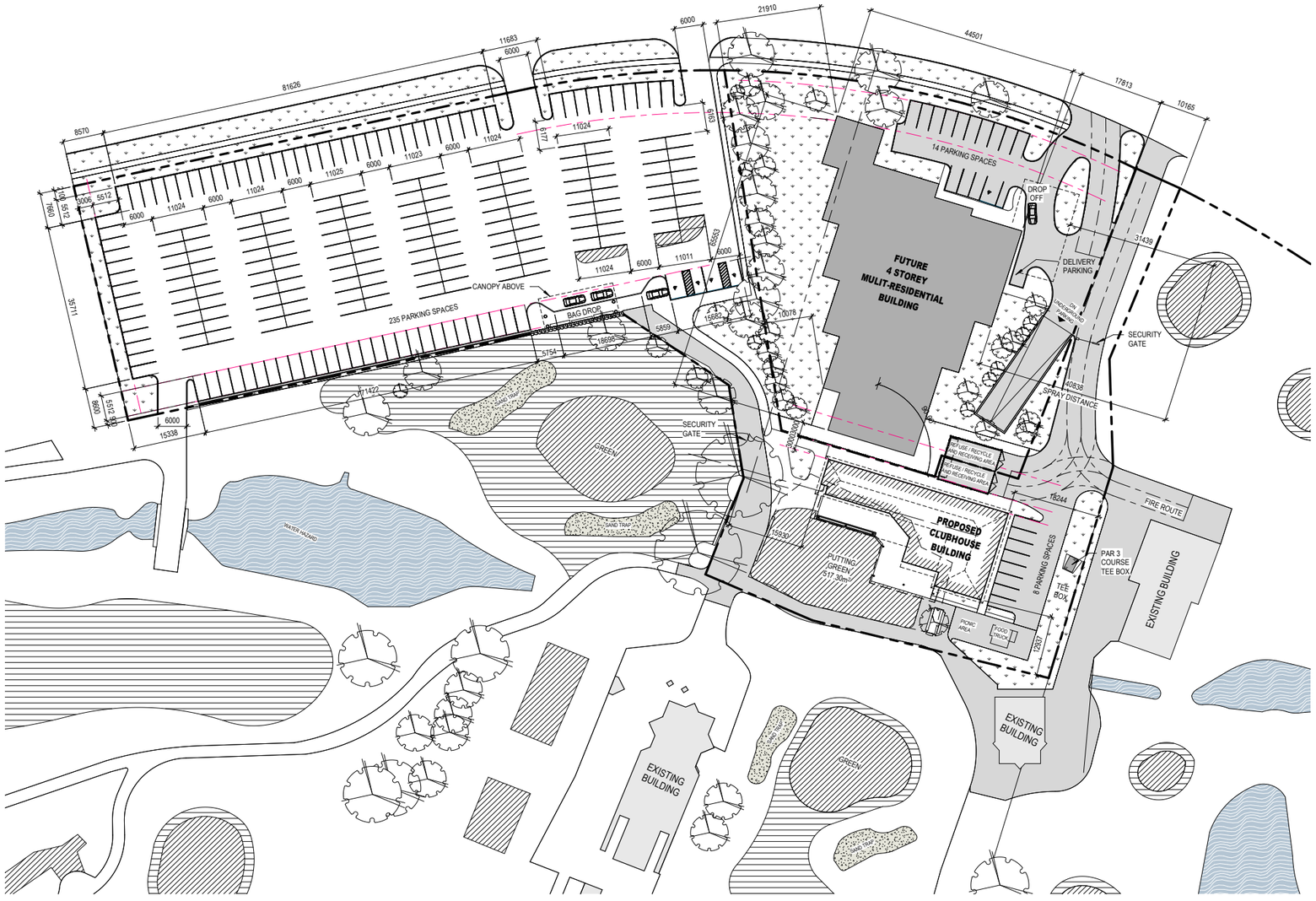
B.F. - "BARRIER FREE PARKING" SIGN
F.R. - "FIRE-ROUTE - NO PARKING" SIGN
B.D.O. - "BUS DROP OFF ZONE" SIGN
S.S. - "STOP" SIGN

REFER TO PLAN FOR LOCATION OF ALL SIGNAGE (REVIEW w/ ARCHITECT PRIOR TO FINAL PLACEMENT)

NOTES:
1. REFER TO CIVIL DRAWINGS FOR ALL PAVEMENT MATERIAL PROFILES AND BASE MATERIALS
2. REFER TO LANDSCAPE PLAN FOR LANDSCAPE INFORMATION.
3. REFER TO CIVIL DRAWINGS FOR ALL PROPOSED GRADES.
4. ALL CONCRETE APRONS AT EXTERIOR DOOR OPENINGS TO MEET FLUSH (BARRIER FREE).
5. PROVIDE BARRIER FREE CURB DROPS WHERE SIDEWALKS MEET ASPHALT PAVEMENT.

ZONING CHART - *INSERT ZONING / BY-LAW REFERENCE HERE*

DESCRIPTION	REQUIRED	PROVIDED	BY-LAW REF.	ADDITIONAL NOTES
ZONING REGULATION	GD1.2	RD3.2 *	12.2	-
PERMITTED USE	CLUB	MULTIPLE DWELLING	12.2.1	-
MINIMUM LOT AREA	3,190 m²	5,394.29 m2	12.2.5(d)(e)(f)	FOR ANY OTHER LOT: (d) FOR THE FIRST 4 DWELLING UNITS 540m² (e) FOR THE NEXT 15 DWELLING UNITS 85m² / UNIT (f) FOR EACH ADDITIONAL DWELLING UNIT 55m² / UNIT
MINIMUM LOT FRONTAGE	30.0m	89.91m	-	-
SETBACK - FRONT YARD	-	8.2m, SEE PLAN	-	LOT FRONTS KENNEDY DRIVE
SETBACK - INTERIOR SIDE YARD	-	17.51 & 21.9m, SEE PLAN	-	YARD ABUTS A RESIDENTIAL
SETBACK - REAR YARD	-	3.0m, SEE PLAN	-	YARD ABUTS A PARK
LOT COVERAGE	MAXIMUM 35%	33.54%	12.2.5.3	LOT AREA COVERED BY ALL BUILDINGS AT GROUND LEVEL: 1,809.46m²
LANDSCAPED AREA	MINIMUM 35%	33.54%	-	LANDSCAPED OPEN SPACE YARD
BUILDING HEIGHT	MAXIMUM OF 18.0 m	-	12.2.5.4	BUILDING HEIGHT - MAXIMUM CORNER LOT - 24.0m INTERIOR LOT- 18.0m
PARKING SPACE - SIZE	MIN. 2.5m x 5.5m	2.55m x 5.5m	24.20.10.1	-
PARKING SPACE - COUNT	1.5 x 44 UNITS = 66	71 SPACES + 14 VISITOR = 85 TOTAL SPACES SEE PLAN	-	
PARKING SPACE - ACCESSIBLE SIZE	TYPE A: 3.5m x 5.5m TYPE B: 2.5m x 5.5m ACCESS AISLE: 1.5m	TYPE A: 3.55m x 5.5m TYPE B: 2.55m x 5.5m ACCESS AISLE: 1.7m	24.24.10.1 24.24.10.2 24.24.15.2	-
PARKING SPACE - ACCESSIBLE COUNT	4 FOR 26 TO 100 SPACES	4, SEE PLAN	24.24.1.1	TYPE A: 2% OF PARKING SPACES TYPE B: 2% OF PARKING SPACES
PARKING AISLE - WIDTH	6.0m (90° SPACES, TWO-WAY)	6.0m OR GREATER, SEE PLAN	25.25.5.50.3	-
LOADING SPACE - SIZE	3.0m x 7.50m x 3.5m (HEIGHT)	3.0m x 7.50m x 3.5m (HEIGHT)	24.40.10.1	-
LOADING SPACE - COUNT	1	1	24.40.1.9	OVER 275m² TO 2,500m² = 1 LOADING SPACE
BICYCLE PARKING	5	5	24.30.1	20 OR MORE - 2 FOR THE FIRST 19 SPACES PLUS 1 FOR EACH ADDITIONAL 20 PARKING SPACES
BICYCLE PARKING - SIZE	0.6m x 2.5m	0.6m x 2.5m	24.30.10	-



1 **SITE PLAN - RESIDENCE**
SCALE: 1 : 500

architectura a+e
180 Eugenie Street West
Windsor, ON N9A 2N6
519.258.1390

Issued For (YYYY.MM.DD)

No.	Description	Date

SHEET NAME
ARCHITECTURAL SITE PLAN - RESIDENCE

City of Windsor
Roseland Clubhouse
455 Kennedy Dr. W., Windsor, ON N9G 1W9

Drawn By: Ai
Checked By: Ai
Project No: 2621-1
Sheet No: **A101B**

2026-03-09 2:28:42 PM C:\Users\jlanes\Documents\2621-1 SITE_jamesk32ZN.rvt

Attachment 2:
ITE Reference Pages

Land Use: 430
Golf Course

Description

A golf course is an expansive landscaped area that includes a series of golf holes, each consisting of a tee, fairway, and putting green. The site may have a driving range, clubhouse with a pro shop, restaurant, lounge, or banquet facility. Miniature golf course (Land Use 431), golf driving range (Land Use 432), and multipurpose recreational facility (Land Use 435) are related uses.

Additional Data

The golf courses in this land use are 9-, 18-, and 36-hole municipal courses.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), California, New Jersey, New York, Oregon, Pennsylvania, and Vermont.

Source Numbers

378, 407, 440, 629, 728, 925, 940, 970

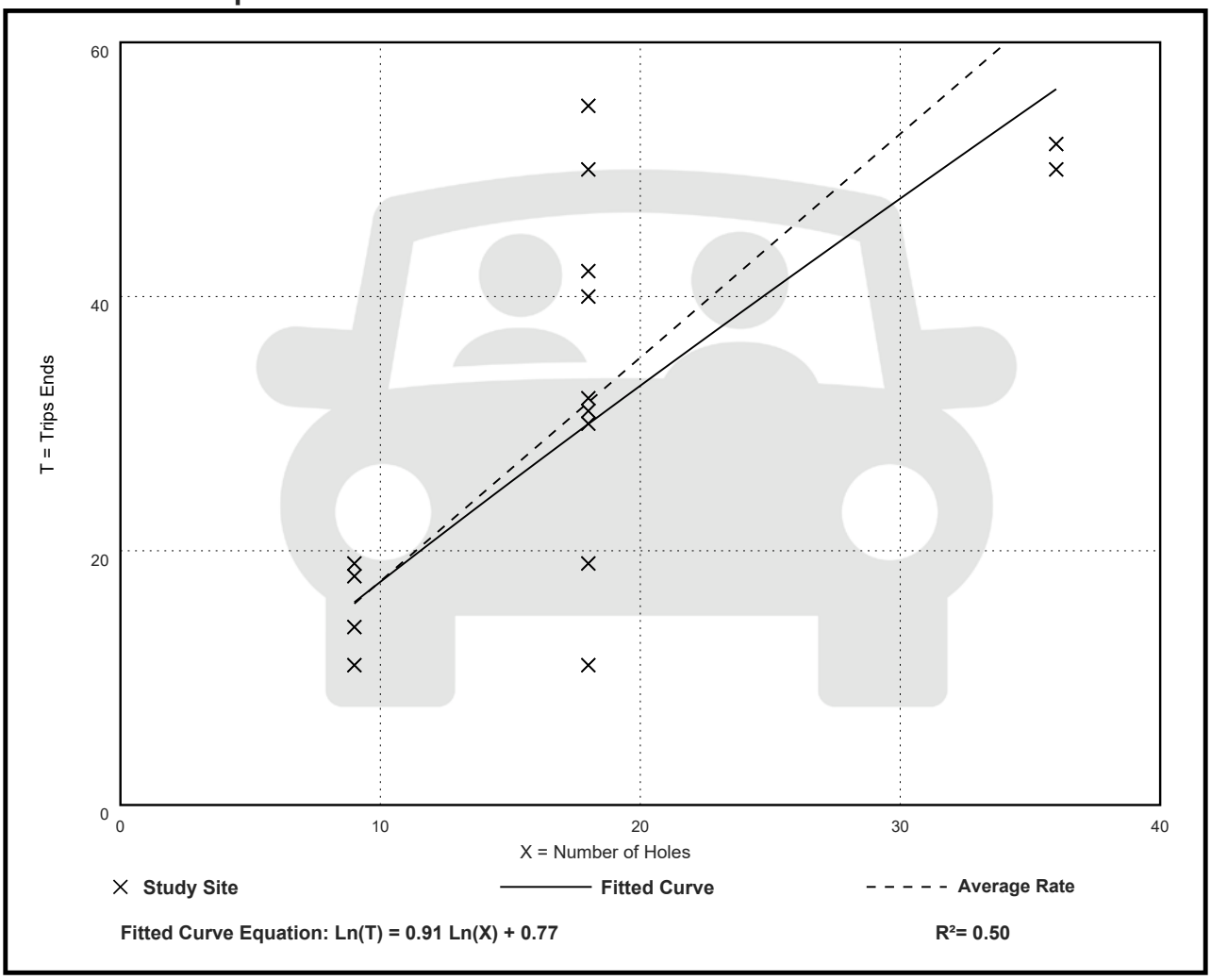
Golf Course
(430)

Vehicle Trip Ends vs: Holes
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 15
Avg. Num. of Holes: 18
Directional Distribution: 79% entering, 21% exiting

Vehicle Trip Generation per Hole

Average Rate	Range of Rates	Standard Deviation
1.76	0.61 - 3.06	0.64

Data Plot and Equation



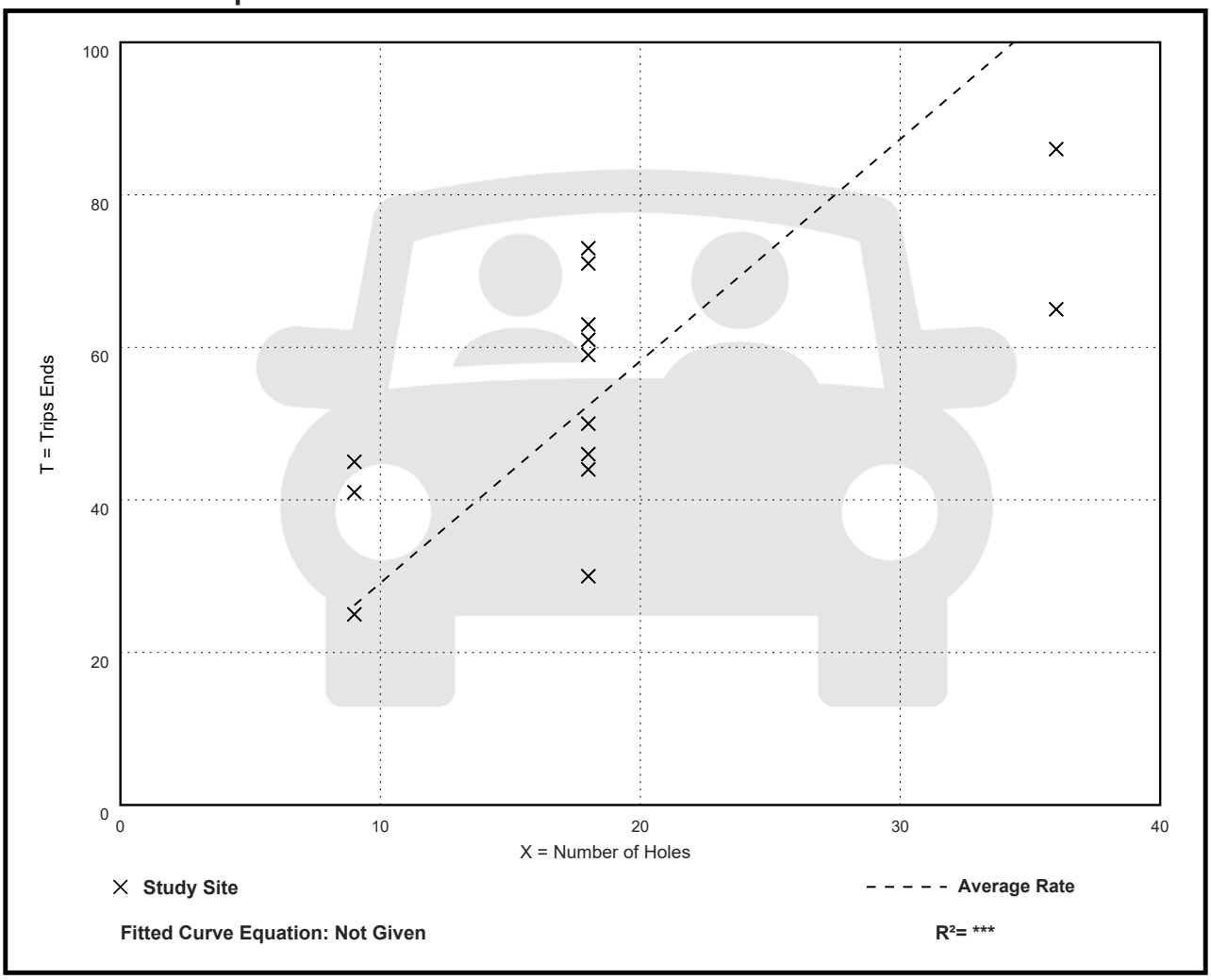
Golf Course
(430)

Vehicle Trip Ends vs: Holes
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 14
Avg. Num. of Holes: 19
Directional Distribution: 53% entering, 47% exiting

Vehicle Trip Generation per Hole

Average Rate	Range of Rates	Standard Deviation
2.91	1.67 - 5.00	0.93

Data Plot and Equation



Land Use: 221
Multifamily Housing (Mid-Rise)

Description

Mid-rise multifamily housing includes apartments and condominiums located in a building that has between four and 10 floors of living space. Access to individual dwelling units is through an outside building entrance, a lobby, elevator, and a set of hallways.

Multifamily housing (low-rise) (Land Use 220), multifamily housing (high-rise) (Land Use 222), off-campus student apartment (mid-rise) (Land Use 226), and mid-rise residential with ground-floor commercial (Land Use 231) are related land uses.

Land Use Subcategory

Data are presented for two subcategories for this land use: (1) not close to rail transit and (2) close to rail transit. A site is considered close to rail transit if the walking distance between the residential site entrance and the closest rail transit station entrance is ½ mile or less.

Additional Data

For the six sites for which both the number of residents and the number of occupied dwelling units were available, there were an average of 2.5 residents per occupied dwelling unit.

For the five sites for which the numbers of both total dwelling units and occupied dwelling units were available, an average of 96 percent of the total dwelling units were occupied.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (https://www.ite.org/technical-resources/topics/trip-and-parking-generation/).

It is expected that the number of bedrooms and number of residents are likely correlated to the trips generated by a residential site. To assist in future analysis, trip generation studies of all multifamily housing should attempt to obtain information on occupancy rate and on the mix of residential unit sizes (i.e., number of units by number of bedrooms at the site complex).

The sites were surveyed in the 1990s, the 2000s, the 2010s, and the 2020s in Alberta (CAN), California, District of Columbia, Florida, Georgia, Illinois, Maryland, Massachusetts, Minnesota, Montana, New Jersey, New York, Ontario (CAN), Oregon, Utah, and Virginia.

Source Numbers

168, 188, 204, 305, 306, 321, 818, 857, 862, 866, 901, 904, 910, 949, 951, 959, 963, 964, 966, 967, 969, 970, 1004, 1014, 1022, 1023, 1025, 1031, 1032, 1035, 1047, 1056, 1057, 1058, 1071, 1076

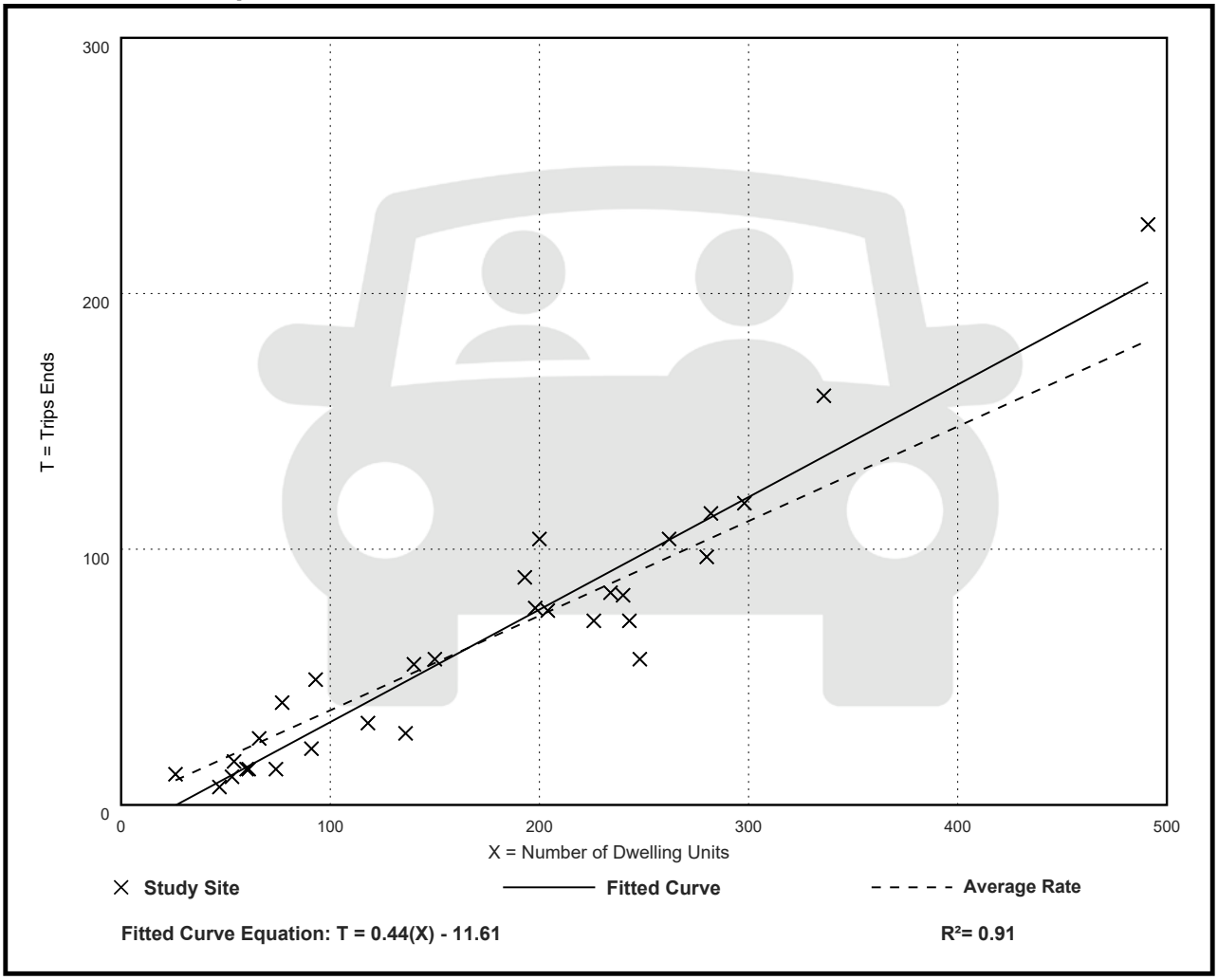
Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 30
Avg. Num. of Dwelling Units: 173
Directional Distribution: 23% entering, 77% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.37	0.15 - 0.53	0.09

Data Plot and Equation



Fitted Curve Equation: T = 0.44(X) - 11.61

R^2= 0.91

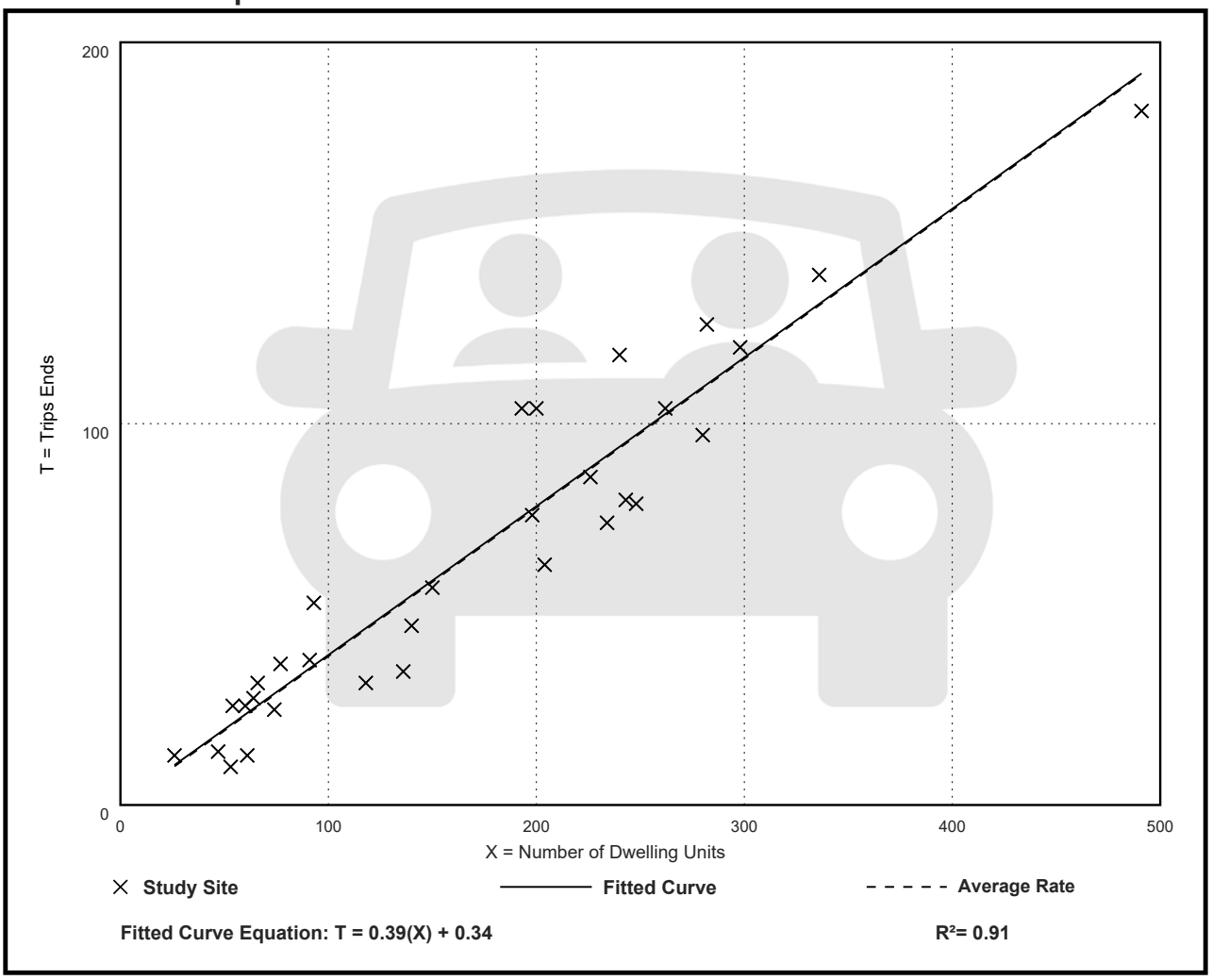
Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 31
Avg. Num. of Dwelling Units: 169
Directional Distribution: 61% entering, 39% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.39	0.19 - 0.57	0.08

Data Plot and Equation



Attachment 3:

Traffic Data and Signal Timing Plans

Ontario Traffic Inc.
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Project #23-048 - City of Windsor

Intersection Count Report

Intersection:	DOUGALL AVE & ROSELAND DR E - COMERCIAL DRIWAY
Municipality:	Windsor
Count Date:	Monday, Mar 20, 2023
Site Code:	2304800081
Count Categories:	Cars, Medium Trucks, Heavy Trucks, Peds, Bicycles
Count Period:	07:00-10:00, 11:00-14:00, 15:00-18:00
Weather:	Clear
Comments:	

Ontario Traffic Inc.
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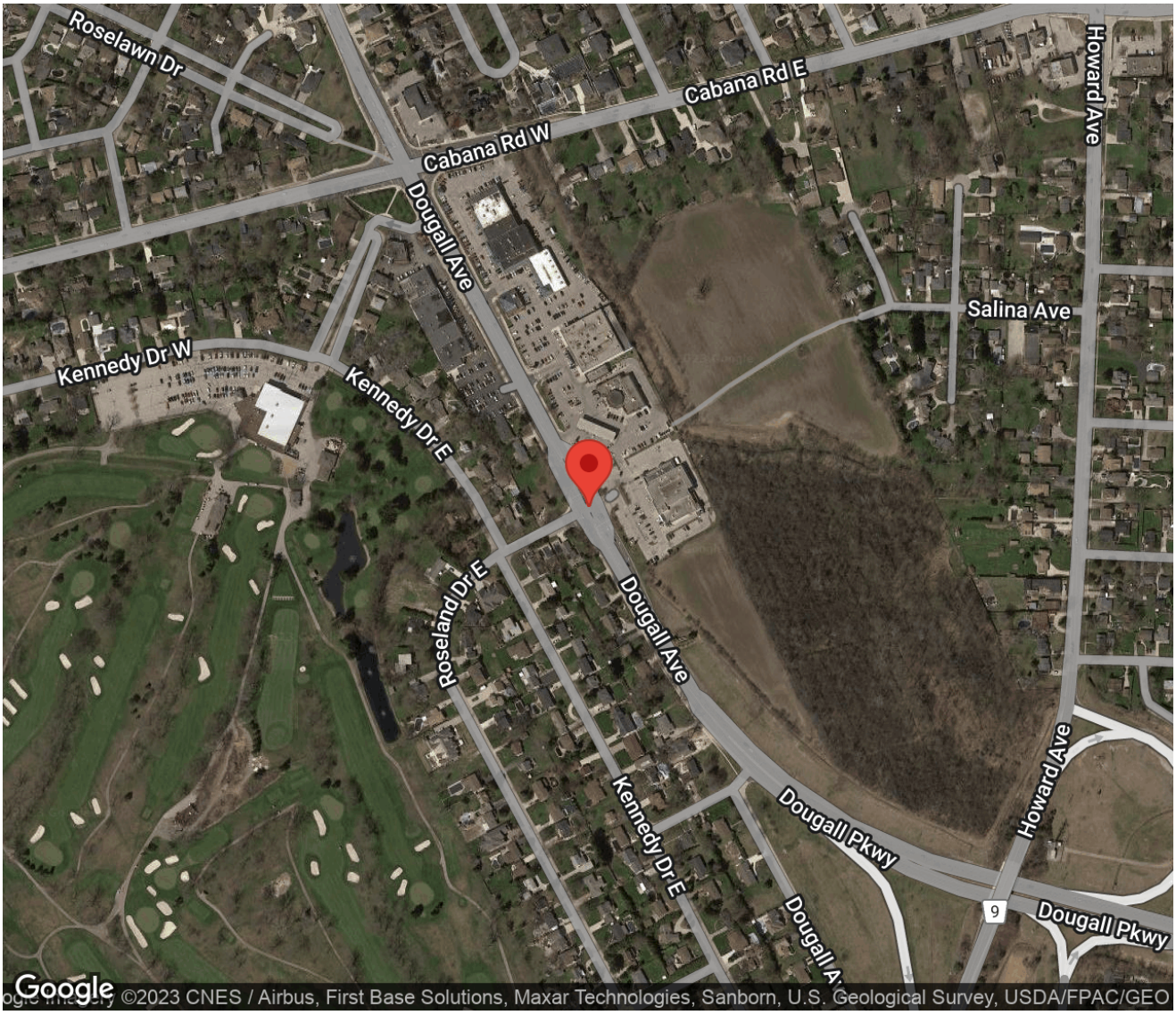
Traffic Count Map

Intersection:	DOUGALL AVE & ROSELAND DR E - COMERCIAL DRIWAY
Site Code:	2304800081
Municipality:	Windsor
Count Date:	Mar 20, 2023



Ontario Traffic Inc.
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Traffic Count Summary

Intersection:	DOUGALL AVE & ROSELAND DR E - COMERCIAL DRIWAY
Site Code:	2304800081
Municipality:	Windsor
Count Date:	Mar 20, 2023

DOUGALL AVE - Traffic Summary

	North Approach Totals						South Approach Totals						
	Includes Cars, Medium Trucks, Heavy Trucks, Bicycles						Includes Cars, Medium Trucks, Heavy Trucks, Bicycles						
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
07:00 - 08:00	13	396	10	1	420	2	2	613	32	0	647	0	1067
08:00 - 09:00	24	459	15	0	498	2	6	804	47	0	857	0	1355
09:00 - 10:00	27	391	24	0	442	4	8	528	43	0	579	0	1021
BREAK													
11:00 - 12:00	40	400	31	0	471	3	8	395	28	0	431	1	902
12:00 - 13:00	50	475	23	0	548	2	3	445	47	0	495	0	1043
13:00 - 14:00	46	498	26	0	570	0	5	433	36	0	474	0	1044
BREAK													
15:00 - 16:00	60	791	49	0	900	3	7	624	44	0	675	1	1575
16:00 - 17:00	67	823	51	0	941	0	9	618	45	0	672	0	1613
17:00 - 18:00	52	710	32	0	794	6	3	598	49	0	650	0	1444
GRAND TOTAL	**379**	**4943**	**261**	**1**	**5584**	**22**	**51**	**5058**	**371**	**0**	**5480**	**2**	**11064**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection:	DOUGALL AVE & ROSELAND DR E - COMERCIAL DRIWAY
Site Code:	2304800081
Municipality:	Windsor
Count Date:	Mar 20, 2023

Commerical Entrance - Traffic Summary

	East Approach Totals						West Approach Totals						
	Includes Cars, Medium Trucks, Heavy Trucks, Bicycles						Includes Cars, Medium Trucks, Heavy Trucks, Bicycles						
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
07:00 - 08:00	11	0	4	0	15	0	36	7	3	0	46	0	61
08:00 - 09:00	21	7	18	0	46	0	46	9	7	0	62	2	108
09:00 - 10:00	30	4	24	0	58	3	39	13	5	0	57	0	115
BREAK													
11:00 - 12:00	44	11	36	0	91	0	31	8	8	0	47	0	138
12:00 - 13:00	47	10	40	0	97	0	49	10	4	0	63	0	160
13:00 - 14:00	27	9	50	0	86	0	41	9	4	0	54	1	140
BREAK													
15:00 - 16:00	51	13	39	0	103	0	39	9	10	0	58	0	161
16:00 - 17:00	67	8	48	0	123	0	39	7	3	0	49	0	172
17:00 - 18:00	59	12	41	0	112	2	28	16	6	0	50	1	162
GRAND TOTAL	**357**	**74**	**300**	**0**	**731**	**5**	**348**	**88**	**50**	**0**	**486**	**4**	**1217**

Ontario Traffic Inc.
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Traffic Count Data

Intersection: DOUGALL AVE & ROSELAND DR E - COMERCIAL DRIWAY
Site Code: 2304800081
Municipality: Windsor
Count Date: Mar 20, 2023

North Approach - DOUGALL AVE

Start Time	Cars					Medium Trucks					Heavy Trucks					Bicycles					Total Peds
					Total					Total					Total					Total	
07:00	2	72	1	1	76	0	2	0	0	2	0	2	1	0	3	0	0	0	0	0	0
07:15	1	92	3	0	96	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	1
07:30	2	108	3	0	113	1	2	1	0	4	0	1	0	0	1	0	0	0	0	0	0
07:45	7	110	1	0	118	0	3	0	0	3	0	2	0	0	2	0	0	0	0	0	1
08:00	8	112	6	0	126	1	1	0	0	2	0	4	0	0	4	0	0	0	0	0	1
08:15	4	115	2	0	121	0	4	0	0	4	0	3	0	0	3	0	0	0	0	0	0
08:30	1	116	1	0	118	0	1	0	0	1	0	3	0	0	3	0	0	0	0	0	0
08:45	10	98	5	0	113	0	1	0	0	1	0	1	1	0	2	0	0	0	0	0	1
09:00	7	111	6	0	124	0	4	0	0	4	0	2	0	0	2	0	0	0	0	0	0
09:15	8	88	7	0	103	1	0	0	0	1	0	2	0	0	2	0	0	0	0	0	4
09:30	5	92	5	0	102	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
09:45	6	90	6	0	102	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
SUBTOTAL	61	1204	46	1	1312	3	19	1	0	23	0	23	2	0	25	0	0	0	0	0	8

Ontario Traffic Inc.
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Traffic Count Data

Intersection: DOUGALL AVE & ROSELAND DR E - COMERCIAL DRIWAY
Site Code: 2304800081
Municipality: Windsor
Count Date: Mar 20, 2023

North Approach - DOUGALL AVE

Start Time	Cars					Medium Trucks					Heavy Trucks					Bicycles					Total Peds
					Total					Total					Total					Total	
11:00	12	94	5	0	111	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0
11:15	10	100	8	0	118	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
11:30	7	96	10	0	113	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	1
11:45	11	102	8	0	121	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	2
12:00	11	124	6	0	141	2	1	0	0	3	0	0	0	0	0	0	0	0	0	0	1
12:15	14	109	6	0	129	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0
12:30	10	111	5	0	126	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
12:45	13	122	5	0	140	0	2	1	0	3	0	0	0	0	0	0	0	0	0	0	1
13:00	10	135	6	0	151	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0
13:15	13	112	8	0	133	0	2	0	0	2	0	1	0	0	1	0	0	1	0	1	0
13:30	12	110	7	0	129	0	3	0	0	3	0	1	0	0	1	0	0	0	0	0	0
13:45	10	124	4	0	138	1	5	0	0	6	0	3	0	0	3	0	0	0	0	0	0
SUBTOTAL	133	1339	78	0	1550	3	24	1	0	28	0	10	0	0	10	0	0	1	0	1	5

Ontario Traffic Inc.
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Traffic Count Data

Intersection: DOUGALL AVE & ROSELAND DR E - COMERCIAL DRIWAY
Site Code: 2304800081
Municipality: Windsor
Count Date: Mar 20, 2023

North Approach - DOUGALL AVE

Start Time	Cars					Medium Trucks					Heavy Trucks					Bicycles					Total Peds
					Total					Total					Total					Total	
15:00	16	190	10	0	216	0	5	0	0	5	0	2	0	0	2	0	0	0	0	0	0
15:15	15	220	9	0	244	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
15:30	13	185	14	0	212	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	1
15:45	15	180	16	0	211	1	5	0	0	6	0	0	0	0	0	0	0	0	0	0	0
16:00	17	187	13	0	217	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0
16:15	13	198	14	0	225	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
16:30	18	217	9	0	244	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0
16:45	19	213	15	0	247	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0
17:00	13	199	7	0	219	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	14	178	7	0	199	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	4
17:30	16	189	10	0	215	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	1
17:45	9	139	8	0	156	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
SUBTOTAL	178	2295	132	0	2605	1	18	0	0	19	0	11	0	0	11	0	0	0	0	0	9
GRAND TOTAL	372	4838	256	1	5467	7	61	2	0	70	0	44	2	0	46	0	0	1	0	1	22

Ontario Traffic Inc.
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Traffic Count Data

Intersection: DOUGALL AVE & ROSELAND DR E - COMERCIAL DRIWAY
Site Code: 2304800081
Municipality: Windsor
Count Date: Mar 20, 2023

South Approach - DOUGALL AVE

Start Time	Cars					Medium Trucks					Heavy Trucks					Bicycles					Total Peds
					Total					Total					Total					Total	
07:00	0	106	5	0	111	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0
07:15	0	119	9	0	128	0	1	1	0	2	0	1	0	0	1	0	0	0	0	0	0
07:30	1	149	8	0	158	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0
07:45	1	225	9	0	235	0	5	0	0	5	0	3	0	0	3	0	0	0	0	0	0
08:00	0	189	13	0	202	0	6	0	0	6	0	3	0	0	3	0	0	0	0	0	0
08:15	2	165	10	0	177	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0
08:30	1	236	16	0	253	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0
08:45	3	200	7	0	210	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0
09:00	1	138	9	0	148	0	3	0	0	3	0	5	0	0	5	0	0	0	0	0	0
09:15	4	116	9	0	129	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0
09:30	3	133	12	0	148	0	3	0	0	3	0	2	0	0	2	0	0	0	0	0	0
09:45	0	120	13	0	133	0	4	0	0	4	0	1	0	0	1	0	0	0	0	0	0
SUBTOTAL	16	1896	120	0	2032	0	31	2	0	33	0	18	0	0	18	0	0	0	0	0	0

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Traffic Count Data

Intersection: DOUGALL AVE & ROSELAND DR E - COMERCIAL DRIWAY
Site Code: 2304800081
Municipality: Windsor
Count Date: Mar 20, 2023

South Approach - DOUGALL AVE

Start Time	Cars					Medium Trucks					Heavy Trucks					Bicycles					Total Peds
					Total					Total					Total					Total	
11:00	2	82	8	0	92	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0
11:15	2	100	5	0	107	1	2	0	0	3	0	0	0	0	0	0	0	0	0	0	1
11:30	1	106	8	0	115	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0
11:45	2	95	7	0	104	0	4	0	0	4	0	2	0	0	2	0	0	0	0	0	0
12:00	2	112	11	0	125	0	1	0	0	1	0	4	0	0	4	0	0	0	0	0	0
12:15	0	101	9	0	110	0	3	0	0	3	0	1	0	0	1	0	0	0	0	0	0
12:30	0	121	12	0	133	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0
12:45	1	99	14	0	114	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	0
13:00	2	105	8	0	115	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0
13:15	0	102	10	0	112	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0
13:30	2	115	9	0	126	1	1	0	0	2	0	1	0	0	1	0	0	0	0	0	0
13:45	0	103	9	0	112	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	14	1241	110	0	1365	2	22	1	0	25	0	10	0	0	10	0	0	0	0	0	1

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Traffic Count Data

Intersection: DOUGALL AVE & ROSELAND DR E - COMERCIAL DRIWAY
Site Code: 2304800081
Municipality: Windsor
Count Date: Mar 20, 2023

South Approach - DOUGALL AVE

Start Time	Cars					Medium Trucks					Heavy Trucks					Bicycles					Total Peds
					Total					Total					Total					Total	
15:00	4	127	12	0	143	0	2	0	0	2	0	3	0	0	3	0	0	0	0	0	0
15:15	1	135	5	0	141	0	1	0	0	1	0	2	0	0	2	0	0	0	0	0	0
15:30	1	168	12	0	181	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0
15:45	1	181	15	0	197	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	1
16:00	6	133	13	0	152	0	1	0	0	1	0	2	0	0	2	0	0	0	0	0	0
16:15	2	134	14	0	150	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
16:30	1	198	10	0	209	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	147	8	0	155	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0
17:00	0	164	12	0	176	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
17:15	1	141	15	0	157	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
17:30	0	133	5	0	138	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
17:45	2	156	17	0	175	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
SUBTOTAL	19	1817	138	0	1974	0	8	0	0	8	0	15	0	0	15	0	0	0	0	0	1
GRAND TOTAL	49	4954	368	0	5371	2	61	3	0	66	0	43	0	0	43	0	0	0	0	0	2

Ontario Traffic Inc.
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Traffic Count Data

Intersection: DOUGALL AVE & ROSELAND DR E - COMERCIAL DRIWAY
Site Code: 2304800081
Municipality: Windsor
Count Date: Mar 20, 2023

East Approach - Commerical Entrance

Start Time	Cars					Medium Trucks					Heavy Trucks					Bicycles					Total Peds
					Total					Total					Total					Total	
07:00	3	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	3	0	2	0	5	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
07:45	1	0	1	0	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
08:00	6	3	5	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	6	0	5	0	11	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
08:30	4	2	5	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	5	2	2	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	6	1	3	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	4	1	5	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30	9	1	7	0	17	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
09:45	11	1	8	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
SUBTOTAL	60	11	44	0	115	2	0	1	0	3	0	0	1	0	1	0	0	0	0	0	3

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: DOUGALL AVE & ROSELAND DR E - COMERCIAL DRIWAY
Site Code: 2304800081
Municipality: Windsor
Count Date: Mar 20, 2023

East Approach - Commerical Entrance

Start Time	Cars					Medium Trucks					Heavy Trucks					Bicycles					Total Peds
					Total					Total					Total					Total	
11:00	10	3	9	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	12	3	12	0	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	12	2	6	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	10	3	9	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	10	1	7	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	11	2	13	0	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	12	2	8	0	22	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
12:45	14	4	12	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00	13	2	11	0	26	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
13:15	7	3	11	0	21	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
13:30	7	2	16	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	2	9	0	11	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	118	29	123	0	270	0	1	3	0	4	0	0	0	0	0	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: DOUGALL AVE & ROSELAND DR E - COMERCIAL DRIWAY
Site Code: 2304800081
Municipality: Windsor
Count Date: Mar 20, 2023

East Approach - Commerical Entrance

Start Time	Cars					Medium Trucks					Heavy Trucks					Bicycles					Total Peds
					Total					Total					Total					Total	
15:00	13	4	15	0	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15	10	2	11	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	11	4	5	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45	17	3	8	0	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	15	2	19	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	17	2	12	0	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	17	2	13	0	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	18	2	4	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	24	4	6	0	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	18	2	12	0	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
17:30	10	4	9	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	7	2	14	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	177	33	128	0	338	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
GRAND TOTAL	**355**	**73**	**295**	**0**	**723**	**2**	**1**	**4**	**0**	**7**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**5**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: DOUGALL AVE & ROSELAND DR E - COMERCIAL DRIWAY
Site Code: 2304800081
Municipality: Windsor
Count Date: Mar 20, 2023

West Approach - ROSELAND DR E

Start Time	Cars					Medium Trucks					Heavy Trucks					Bicycles					Total Peds
					Total					Total					Total					Total	
07:00	6	2	1	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	9	3	1	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	7	1	0	0	8	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
07:45	13	1	1	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	14	0	3	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:15	8	4	2	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:30	13	2	1	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	11	3	1	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	11	3	1	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	4	6	3	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30	14	3	1	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45	10	1	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	120	29	15	0	164	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: DOUGALL AVE & ROSELAND DR E - COMERCIAL DRIWAY
Site Code: 2304800081
Municipality: Windsor
Count Date: Mar 20, 2023

West Approach - ROSELAND DR E

Start Time	Cars					Medium Trucks					Heavy Trucks					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
11:00	8	4	3	0	15	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
11:15	3	2	1	0	6	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
11:30	8	1	1	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	12	1	1	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	10	2	1	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	14	1	2	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	14	1	1	0	16	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
12:45	10	6	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00	8	2	1	0	11	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
13:15	10	3	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	14	2	2	0	18	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
13:45	7	2	1	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	118	27	14	0	159	3	0	2	0	5	0	0	0	0	0	0	0	0	0	0	1

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: DOUGALL AVE & ROSELAND DR E - COMERCIAL DRIWAY
Site Code: 2304800081
Municipality: Windsor
Count Date: Mar 20, 2023

West Approach - ROSELAND DR E

Start Time	Cars					Medium Trucks					Heavy Trucks					Bicycles					Total Peds
					Total					Total					Total					Total	
15:00	7	4	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15	7	2	4	0	13	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
15:30	18	2	2	0	22	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
15:45	5	1	4	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	13	1	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	10	3	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	7	2	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	8	1	2	0	11	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0
17:00	6	3	2	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	7	5	1	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	4	4	2	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	10	4	1	0	15	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
SUBTOTAL	102	32	18	0	152	3	0	1	0	4	1	0	0	0	1	0	0	0	0	0	1
GRAND TOTAL	340	88	47	0	475	6	0	3	0	9	2	0	0	0	2	0	0	0	0	0	4

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	07:00:00	From:	07:45:00
To:	10:00:00	To:	08:45:00

Intersection: DOUGALL AVE & ROSELAND DR E - COMERCIAL DRIWAY
Site Code: 2304800081
Count Date: Mar 20, 2023

Weather conditions: Clear

**** Signalized Intersection ****

Major Road: DOUGALL AVE runs N/S

North Approach

	Out	In	Total
Cars	483	879	1362
MT	10	14	24
HT	12	7	19
Bicycles	0	0	0
	505	**900**	**1405**

DOUGALL AVE

Bicycles	0	0	0	0
HT	0	12	0	0
MT	0	9	1	0
Cars	10	453	20	0
Totals	**10**	**474**	**21**	**0**

East Approach

	Out	In	Total
Cars	38	75	113
MT	2	2	4
HT	0	0	0
Bicycles	0	0	0
	40	**77**	**117**

ROSELAND DR E

Bicycles	HT	MT	Cars	Totals
0	0	0	0	**0**
0	0	0	48	**48**
0	0	0	7	**7**
0	0	0	7	**7**

Peds: 2

Peds: 2

Peds: 0

Peds: 0

Commerical Entrance

Totals	Cars	MT	HT	Bicycles
0	0	0	0	0
17	16	1	0	0
5	5	0	0	0
18	17	1	0	0

West Approach

	Out	In	Total
Cars	62	19	81
MT	0	0	0
HT	0	0	0
Bicycles	0	0	0
	62	**19**	**81**

DOUGALL AVE

Totals	4	835	49	0
Cars	4	815	48	0
MT	0	13	1	0
HT	0	7	0	0
Bicycles	0	0	0	0

South Approach

	Out	In	Total
Cars	867	477	1344
MT	14	10	24
HT	7	12	19
Bicycles	0	0	0
	888	**499**	**1387**

Cars - Cars MT - Medium Trucks HT - Heavy Trucks Bicycles - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection: DOUGALL AVE & ROSELAND DR E - COMERCIAL DRIWAY
Site Code: 2304800081
Count Date: Mar 20, 2023
Period: 07:00 - 10:00

Peak Hour Data (07:45 - 08:45)

Start Time	North Approach DOUGALL AVE						South Approach DOUGALL AVE						East Approach Commerical Entrance						West Approach ROSELAND DR E						Total Vehicles
					Peds	Total					Peds	Total					Peds	Total					Peds	Total	
07:45	7	115	1	0	1	123	1	233	9	0	0	243	2	0	1	0	0	3	13	1	1	0	0	15	384
08:00	9	117	6	0	1	132	0	198	13	0	0	211	6	3	5	0	0	14	14	0	3	0	1	17	374
08:15	4	122	2	0	0	128	2	167	10	0	0	179	6	0	6	0	0	12	8	4	2	0	1	14	333
08:30	1	120	1	0	0	122	1	237	17	0	0	255	4	2	5	0	0	11	13	2	1	0	0	16	404
Grand Total	**21**	**474**	**10**	**0**	**2**	**505**	**4**	**835**	**49**	**0**	**0**	**888**	**18**	**5**	**17**	**0**	**0**	**40**	**48**	**7**	**7**	**0**	**2**	**62**	**1495**
Approach %	4.2	93.9	2	0		-	0.5	94	5.5	0		-	45	12.5	42.5	0		-	77.4	11.3	11.3	0		-	
Totals %	1.4	31.7	0.7	0		33.8	0.3	55.9	3.3	0		59.4	1.2	0.3	1.1	0		2.7	3.2	0.5	0.5	0		4.1	
PHF	**0.58**	**0.97**	**0.42**	**0**		**0.96**	**0.5**	**0.88**	**0.72**	**0**		**0.87**	**0.75**	**0.42**	**0.71**	**0**		**0.71**	**0.86**	**0.44**	**0.58**	**0**		**0.91**	**0.93**
Cars	20	453	10	0		483	4	815	48	0		867	17	5	16	0		38	48	7	7	0		62	1450
% Cars	95.2	95.6	100	0		95.6	100	97.6	98	0		97.6	94.4	100	94.1	0		95	100	100	100	0		100	97
Medium Trucks	1	9	0	0		10	0	13	1	0		14	1	0	1	0		2	0	0	0	0		0	26
% Medium Trucks	4.8	1.9	0	0		2	0	1.6	2	0		1.6	5.6	0	5.9	0		5	0	0	0	0		0	1.7
Heavy Trucks	0	12	0	0		12	0	7	0	0		7	0	0	0	0		0	0	0	0	0		0	19
% Heavy Trucks	0	2.5	0	0		2.4	0	0.8	0	0		0.8	0	0	0	0		0	0	0	0	0		0	1.3
Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
% Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
Peds					2	-					0	-					0	-					2	-	4
% Peds					50	-					0	-					0	-					50	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	11:00:00	From:	12:15:00
To:	14:00:00	To:	13:15:00

Intersection: DOUGALL AVE & ROSELAND DR E - COMERCIAL DRIWAY
Site Code: 2304800081
Count Date: Mar 20, 2023

Weather conditions: Clear

**** Signalized Intersection ****

Major Road: DOUGALL AVE runs N/S

North Approach

	Out	In	Total
Cars	546	516	1062
MT	9	9	18
HT	2	3	5
Bicycles	0	0	0
	557	**528**	**1085**

DOUGALL AVE

Bicycles	0	0	0	0
HT	0	2	0	0
MT	1	8	0	0
Cars	22	477	47	0
Totals	**23**	**487**	**47**	**0**

East Approach

	Out	In	Total
Cars	104	100	204
MT	2	1	3
HT	0	0	0
Bicycles	0	0	0
	106	**101**	**207**

ROSELAND DR E

Bicycles	HT	MT	Cars	Totals
0	0	0	0	**0**
0	0	2	46	**48**
0	0	0	10	**10**
0	0	0	4	**4**

Peds: 1

Peds: 0

Peds: 0

Commerical Entrance

Totals	Cars	MT	HT	Bicycles
0	0	0	0	0
45	44	1	0	0
11	10	1	0	0
50	50	0	0	0

West Approach

	Out	In	Total
Cars	60	35	95
MT	2	2	4
HT	0	0	0
Bicycles	0	0	0
	62	**37**	**99**

DOUGALL AVE

Totals	3	435	44	0
Cars	3	426	43	0
MT	0	6	1	0
HT	0	3	0	0
Bicycles	0	0	0	0

South Approach

	Out	In	Total
Cars	472	531	1003
MT	7	8	15
HT	3	2	5
Bicycles	0	0	0
	482	**541**	**1023**

Cars - Cars MT - Medium Trucks HT - Heavy Trucks Bicycles - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection: DOUGALL AVE & ROSELAND DR E - COMERCIAL DRIWAY
Site Code: 2304800081
Count Date: Mar 20, 2023
Period: 11:00 - 14:00

Peak Hour Data (12:15 - 13:15)

Start Time	North Approach DOUGALL AVE						South Approach DOUGALL AVE						East Approach Commerical Entrance						West Approach ROSELAND DR E						Total Vehicles
					Peds	Total					Peds	Total					Peds	Total					Peds	Total	
12:15	14	114	6	0	0	134	0	105	9	0	0	114	11	2	13	0	0	26	14	1	2	0	0	17	291
12:30	10	112	5	0	0	127	0	123	12	0	0	135	12	3	8	0	0	23	15	1	1	0	0	17	302
12:45	13	124	6	0	1	143	1	100	15	0	0	116	14	4	12	0	0	30	10	6	0	0	0	16	305
13:00	10	137	6	0	0	153	2	107	8	0	0	117	13	2	12	0	0	27	9	2	1	0	0	12	309
Grand Total	**47**	**487**	**23**	**0**	**1**	**557**	**3**	**435**	**44**	**0**	**0**	**482**	**50**	**11**	**45**	**0**	**0**	**106**	**48**	**10**	**4**	**0**	**0**	**62**	**1207**
Approach %	8.4	87.4	4.1	0		-	0.6	90.2	9.1	0		-	47.2	10.4	42.5	0		-	77.4	16.1	6.5	0		-	
Totals %	3.9	40.3	1.9	0		46.1	0.2	36	3.6	0		39.9	4.1	0.9	3.7	0		8.8	4	0.8	0.3	0		5.1	
PHF	**0.84**	**0.89**	**0.96**	**0**		**0.91**	**0.38**	**0.88**	**0.73**	**0**		**0.89**	**0.89**	**0.69**	**0.87**	**0**		**0.88**	**0.8**	**0.42**	**0.5**	**0**		**0.91**	**0.98**
Cars	47	477	22	0		546	3	426	43	0		472	50	10	44	0		104	46	10	4	0		60	1182
% Cars	100	97.9	95.7	0		98	100	97.9	97.7	0		97.9	100	90.9	97.8	0		98.1	95.8	100	100	0		96.8	97.9
Medium Trucks	0	8	1	0		9	0	6	1	0		7	0	1	1	0		2	2	0	0	0		2	20
% Medium Trucks	0	1.6	4.3	0		1.6	0	1.4	2.3	0		1.5	0	9.1	2.2	0		1.9	4.2	0	0	0		3.2	1.7
Heavy Trucks	0	2	0	0		2	0	3	0	0		3	0	0	0	0		0	0	0	0	0		0	5
% Heavy Trucks	0	0.4	0	0		0.4	0	0.7	0	0		0.6	0	0	0	0		0	0	0	0	0		0	0.4
Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
% Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
Peds					1	-					0	-					0	-					0	-	1
% Peds					100	-					0	-					0	-					0	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	15:00:00	From:	16:15:00
To:	18:00:00	To:	17:15:00

Intersection: DOUGALL AVE & ROSELAND DR E - COMERCIAL DRIWAY
Site Code: 2304800081
Count Date: Mar 20, 2023

Weather conditions: Clear

**** Signalized Intersection ****

Major Road: DOUGALL AVE runs N/S

North Approach

	Out	In	Total
Cars	935	709	1644
MT	1	5	6
HT	5	0	5
Bicycles	0	0	0
	941	**714**	**1655**

DOUGALL AVE

Bicycles	0	0	0	0
HT	0	5	0	0
MT	0	1	0	0
Cars	45	827	63	0
Totals	**45**	**833**	**63**	**0**

East Approach

	Out	In	Total
Cars	121	116	237
MT	0	0	0
HT	0	0	0
Bicycles	0	0	0
	121	**116**	**237**

Peds: 0

ROSELAND DR E

Bicycles	HT	MT	Cars	Totals
0	0	0	0	**0**
0	0	1	31	**32**
0	0	0	9	**9**
0	0	1	4	**5**

Peds: 0

Peds: 0

Commerical Entrance

Totals	Cars	MT	HT	Bicycles
0	0	0	0	0
35	35	0	0	0
10	10	0	0	0
76	76	0	0	0

Peds: 0

West Approach

	Out	In	Total
Cars	44	58	102
MT	2	0	2
HT	0	0	0
Bicycles	0	0	0
	46	**58**	**104**

Totals	3	647	44	0
Cars	3	643	44	0
MT	0	4	0	0
HT	0	0	0	0
Bicycles	0	0	0	0

DOUGALL AVE

South Approach

	Out	In	Total
Cars	690	907	1597
MT	4	2	6
HT	0	5	5
Bicycles	0	0	0
	694	**914**	**1608**

Cars - Cars MT - Medium Trucks HT - Heavy Trucks Bicycles - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection: DOUGALL AVE & ROSELAND DR E - COMERCIAL DRIWAY
Site Code: 2304800081
Count Date: Mar 20, 2023
Period: 15:00 - 18:00

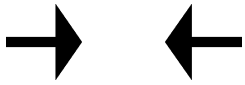
Peak Hour Data (16:15 - 17:15)

Start Time	North Approach DOUGALL AVE						South Approach DOUGALL AVE						East Approach Commerical Entrance						West Approach ROSELAND DR E						Total Vehicles
					Peds	Total					Peds	Total					Peds	Total					Peds	Total	
16:15	13	199	14	0	0	226	2	135	14	0	0	151	17	2	12	0	0	31	10	3	0	0	0	13	421
16:30	18	219	9	0	0	246	1	198	10	0	0	209	17	2	13	0	0	32	7	2	0	0	0	9	496
16:45	19	216	15	0	0	250	0	149	8	0	0	157	18	2	4	0	0	24	9	1	3	0	0	13	444
17:00	13	199	7	0	0	219	0	165	12	0	0	177	24	4	6	0	0	34	6	3	2	0	0	11	441
Grand Total	**63**	**833**	**45**	**0**	**0**	**941**	**3**	**647**	**44**	**0**	**0**	**694**	**76**	**10**	**35**	**0**	**0**	**121**	**32**	**9**	**5**	**0**	**0**	**46**	**1802**
Approach %	6.7	88.5	4.8	0		-	0.4	93.2	6.3	0		-	62.8	8.3	28.9	0		-	69.6	19.6	10.9	0		-	
Totals %	3.5	46.2	2.5	0		52.2	0.2	35.9	2.4	0		38.5	4.2	0.6	1.9	0		6.7	1.8	0.5	0.3	0		2.6	
PHF	**0.83**	**0.95**	**0.75**	**0**		**0.94**	**0.38**	**0.82**	**0.79**	**0**		**0.83**	**0.79**	**0.63**	**0.67**	**0**		**0.89**	**0.8**	**0.75**	**0.42**	**0**		**0.88**	**0.91**
Cars	63	827	45	0		935	3	643	44	0		690	76	10	35	0		121	31	9	4	0		44	1790
% Cars	100	99.3	100	0		99.4	100	99.4	100	0		99.4	100	100	100	0		100	96.9	100	80	0		95.7	99.3
Medium Trucks	0	1	0	0		1	0	4	0	0		4	0	0	0	0		0	1	0	1	0		2	7
% Medium Trucks	0	0.1	0	0		0.1	0	0.6	0	0		0.6	0	0	0	0		0	3.1	0	20	0		4.3	0.4
Heavy Trucks	0	5	0	0		5	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	5
% Heavy Trucks	0	0.6	0	0		0.5	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0.3
Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
% Bicycles	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

City of Windsor Advanced Traffic Management System
Historical Snapshot Report Report

D4-DOUGALL and ROSELAND
Intersection Asset Num: 1630: D4-DOUGALL-ROSELAND-
2026-03-04 From 12:00 AM , To 11:59 PM

Phase Diagram

1	2 	3	4 
5	6 	7	8

Report generated on: 2026-03-04 8:34:15 AM

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Pattern Summary: 1630: D4-DOUGALL-ROSELAND-

Pattern Summary

Pattern	Cycle	Offset	1	2-SBT	3	4-EBT	5	6-NBT	7	8	9	10	11	12	13	14	15	16
1	102	23	0	69	0	33	0	69	0	0	0	0	0	0	0	0	0	0
2	108	17	0	77	0	31	0	77	0	0	0	0	0	0	0	0	0	0
3	110	92	0	77	0	33	0	77	0	0	0	0	0	0	0	0	0	0
5	86	66	0	54	0	32	0	54	0	0	0	0	0	0	0	0	0	0
6	86	13	0	58	0	28	0	58	0	0	0	0	0	0	0	0	0	0
10	86	6	0	54	0	32	0	54	0	0	0	0	0	0	0	0	0	0
11	100	46	0	68	0	32	0	68	0	0	0	0	0	0	0	0	0	0
12	106	55	0	74	0	32	0	74	0	0	0	0	0	0	0	0	0	0
13	106	92	0	72	0	34	0	72	0	0	0	0	0	0	0	0	0	0
15	86	66	0	54	0	32	0	54	0	0	0	0	0	0	0	0	0	0
21	102	23	0	69	0	33	0	69	0	0	0	0	0	0	0	0	0	0
22	108	17	0	77	0	31	0	77	0	0	0	0	0	0	0	0	0	0
23	110	92	0	77	0	33	0	77	0	0	0	0	0	0	0	0	0	0
25	86	66	0	54	0	32	0	54	0	0	0	0	0	0	0	0	0	0
30	110	24	0	77	0	33	0	77	0	0	0	0	0	0	0	0	0	0

Pattern Green Summary

Pattern	Cycle	Offset	1	2-SBT	3	4-EBT	5	6-NBT	7	8	9	10	11	12	13	14	15	16
1	102	23	0	64	0	28	0	64	0	0	0	0	0	0	0	0	0	0
2	108	17	0	72	0	26	0	72	0	0	0	0	0	0	0	0	0	0
3	110	92	0	72	0	28	0	72	0	0	0	0	0	0	0	0	0	0
5	86	66	0	49	0	27	0	49	0	0	0	0	0	0	0	0	0	0
6	86	13	0	53	0	23	0	53	0	0	0	0	0	0	0	0	0	0
10	86	6	0	49	0	27	0	49	0	0	0	0	0	0	0	0	0	0
11	100	46	0	63	0	27	0	63	0	0	0	0	0	0	0	0	0	0
12	106	55	0	69	0	27	0	69	0	0	0	0	0	0	0	0	0	0
13	106	92	0	67	0	29	0	67	0	0	0	0	0	0	0	0	0	0
15	86	66	0	49	0	27	0	49	0	0	0	0	0	0	0	0	0	0
21	102	23	0	64	0	28	0	64	0	0	0	0	0	0	0	0	0	0
22	108	17	0	72	0	26	0	72	0	0	0	0	0	0	0	0	0	0
23	110	92	0	72	0	28	0	72	0	0	0	0	0	0	0	0	0	0
25	86	66	0	49	0	27	0	49	0	0	0	0	0	0	0	0	0	0
30	110	24	0	72	0	28	0	72	0	0	0	0	0	0	0	0	0	0

Controller Database Configuration: 1630: D4-DOUGALL-ROSELAND-
2026-03-04 from 12:00 AM to 11:59 PM

Phase Timing

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Min Green	0	10	0	10	0	10	0	0	0	0	0	0	0	0	0	0
Vehicle Extension	0	4	0	4	0	4	0	0	0	0	0	0	0	0	0	0
Max Green 1	0	80	0	80	0	80	0	0	0	0	0	0	0	0	0	0
Max Green 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Green 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Extension	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yellow Change	0	4	0	4	0	4	0	0	0	0	0	0	0	0	0	0
Red Clear	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0
Advanced Flasher Time	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bike Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	7	0	7	0	7	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	15	0	16	0	15	0	0	0	0	0	0	0	0	0	0
Walk 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solid Don't Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Early Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Added Initial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Initial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Reduce After	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time To Reduce	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Conditional Service Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Conditional Service Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red Revert	0	2.5	0	2.5	0	2.5	0	0	0	0	0	0	0	0	0	0
Negative Overlap Ped Hold Off	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Audible Pedestrian Disconnect	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Preempt Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Preempt Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Preempt Pedestrian Clear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Preempt Return Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DW Hold	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red Hold	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Controller Database Configuration: 1630: D4-DOUGALL-ROSELAND-
2026-03-04 from 12:00 AM to 11:59 PM

TOD Pattern Events

			Days of Week							Holidays										
Event	Hour	Minute	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	Mode	Pattern	Offset
1	0	0	X	X	X	X	X	X	X									Scheduler	5	1
2	1	0	X	X	X	X	X	X	X									Scheduler	5	1
3	6	0	X	X	X	X	X	X	X									Scheduler	1	1
4	9	30	X	X	X	X	X	X	X									Scheduler	2	1
5	15	0	X	X	X	X	X	X	X									Scheduler	2	1
6	16	0	X	X	X	X	X	X	X									Scheduler	3	1
7	18	30	X	X	X	X	X	X	X									Scheduler	2	1
8	21	30	X	X	X	X	X	X	X									Scheduler	2	1
26	22	15													X			Scheduler	30	1

Coordination Pattern

Coordination Pattern 1

Pattern	1	Description													
Cycle Length	102														
Ring Group 1 Offset 1		23	Ring Group 1 Offset 2	0	Ring Group 1 Offset 3	0									
Ring Group 2 Offset 1		0	Ring Group 2 Offset 2	0	Ring Group 2 Offset 3	0									
Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Split	0	69	0	33	0	69	0	0	0	0	0	0	0	0	0	0
Split Extension	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Floating Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Permissive Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Trans Split	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Trans Split	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Split 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Per Adjust Before	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Per Adjust After	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Coordination Pattern 2

Pattern	2	Description													
Cycle Length	108														
Ring Group 1 Offset 1		17	Ring Group 1 Offset 2	0	Ring Group 1 Offset 3	0									
Ring Group 2 Offset 1		0	Ring Group 2 Offset 2	0	Ring Group 2 Offset 3	0									
Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Split	0	77	0	31	0	77	0	0	0	0	0	0	0	0	0	0
Split Extension	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Floating Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Permissive Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Trans Split	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Trans Split	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Split 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Per Adjust Before	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Per Adjust After	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Coordination Pattern 3

Pattern	3	Description													
Cycle Length	110														
Ring Group 1 Offset 1		92	Ring Group 1 Offset 2	0	Ring Group 1 Offset 3	0									
Ring Group 2 Offset 1		0	Ring Group 2 Offset 2	0	Ring Group 2 Offset 3	0									
Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Split	0	77	0	33	0	77	0	0	0	0	0	0	0	0	0	0
Split Extension	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Floating Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Permissive Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Trans Split	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Trans Split	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Split 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Per Adjust Before	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Per Adjust After	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Coordination Pattern 5

Pattern	5	Description													
Cycle Length	86														
Ring Group 1 Offset 1		66	Ring Group 1 Offset 2		0	Ring Group 1 Offset 3		0							
Ring Group 2 Offset 1		0	Ring Group 2 Offset 2		0	Ring Group 2 Offset 3		0							
Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Split	0	54	0	32	0	54	0	0	0	0	0	0	0	0	0	0
Split Extension	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Floating Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Permissive Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Trans Split	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Trans Split	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Split 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Per Adjust Before	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Per Adjust After	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Coordination Pattern 30

Pattern	30	Description													
Cycle Length	110														
Ring Group 1 Offset 1		24	Ring Group 1 Offset 2		0	Ring Group 1 Offset 3		0							
Ring Group 2 Offset 1		0	Ring Group 2 Offset 2		0	Ring Group 2 Offset 3		0							
Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Split	0	77	0	33	0	77	0	0	0	0	0	0	0	0	0	0
Split Extension	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Floating Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Permissive Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Trans Split	0	70	0	30	0	40	0	0	0	0	0	0	0	0	0	0
Max Trans Split	0	84	0	36	0	84	0	0	0	0	0	0	0	0	0	0
Split 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Per Adjust Before	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Per Adjust After	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Coordination Pattern Option

Coordination Pattern Option 1

Permanent Mode	Sing Band		**Ped Permanent Mode**			Partial		**Max Green Mode**			Max Inh		**Walk Rest Mode**		Yield	
Permanent Limit	2		**Permanent 2 Start**			0		**Permanent 2 End**			0					
Alternate Sequence	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**								
									TOD Link		0					
Trans Mode	Default		**Offset Refresh**			Default		**Adapt Mode**			Disable					
Phase	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Coord Phases		X				X										
No Extend																
Float Enable		X		X		X										
Veh=Ped Permissive		X		X		X										
Walk Rest		X				X										
Ped Recall																
Cond Ped Call																
Olap Ped Recall																
Ped Recycle																
Min Recall																
Max Recall																
Cond Service																
Reservice																
Veh Omit																
Ped Omit																
Olap Omit																
Perm Reserve																
Perm1 Phases																
Max Inhibit																
FYA Omit																
Adapt Phs																
FYA Adapt																
FYA Red Rest																

Coordination Pattern Option 2

Permanent Mode	Sing Band		**Ped Permanent Mode**			Partial		**Max Green Mode**			Max Inh		**Walk Rest Mode**		Yield	
Permanent Limit	2		**Permanent 2 Start**			0		**Permanent 2 End**			0					
Alternate Sequence	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**								
									TOD Link		0					
Trans Mode	Default		**Offset Refresh**			Default		**Adapt Mode**			Disable					
Phase	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Coord Phases		X				X										
No Extend																
Float Enable		X		X		X										
Veh=Ped Permissive		X		X		X										
Walk Rest		X				X										
Ped Recall																
Cond Ped Call																
Olap Ped Recall																
Ped Recycle																
Min Recall																
Max Recall																
Cond Service																
Reservice																
Veh Omit																
Ped Omit																
Olap Omit																
Perm Reserve																
Perm1 Phases																
Max Inhibit																
FYA Omit																
Adapt Phs																
FYA Adapt																
FYA Red Rest																

Coordination Pattern Option 3

Permanent Mode	Sing Band		**Ped Permanent Mode**			Partial		**Max Green Mode**			Max Inh		**Walk Rest Mode**		Yield	
Permanent Limit	2		**Permanent 2 Start**			0		**Permanent 2 End**			0					
Alternate Sequence	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**								
									TOD Link		0					
Trans Mode	Default		**Offset Refresh**			Default		**Adapt Mode**			Disable					
Phase	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Coord Phases		X				X										
No Extend																
Float Enable		X		X		X										
Veh=Ped Permissive		X		X		X										
Walk Rest		X				X										
Ped Recall																
Cond Ped Call																
Olap Ped Recall																
Ped Recycle																
Min Recall																
Max Recall																
Cond Service																
Reservice																
Veh Omit																
Ped Omit																
Olap Omit																
Perm Reserve																
Perm1 Phases																
Max Inhibit																
FYA Omit																
Adapt Phs																
FYA Adapt																
FYA Red Rest																

Coordination Pattern Option 5

Permanent Mode	Sing Band		**Ped Permanent Mode**			Partial		**Max Green Mode**			Max Inh		**Walk Rest Mode**		Yield	
Permanent Limit	2		**Permanent 2 Start**			0		**Permanent 2 End**			0					
Alternate Sequence	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**								
									TOD Link		0					
Trans Mode	Default		**Offset Refresh**			Default		**Adapt Mode**			Disable					
Phase	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Coord Phases		X				X										
No Extend																
Float Enable		X		X		X										
Veh=Ped Permissive		X		X		X										
Walk Rest		X				X										
Ped Recall																
Cond Ped Call																
Olap Ped Recall																
Ped Recycle																
Min Recall																
Max Recall																
Cond Service																
Reservice																
Veh Omit																
Ped Omit																
Olap Omit																
Perm Reserve																
Perm1 Phases																
Max Inhibit																
FYA Omit																
Adapt Phs																
FYA Adapt																
FYA Red Rest																

Coordination Pattern Option 30

Permanent Mode	Sing Band		**Ped Permanent Mode**			Partial		**Max Green Mode**			Max Inh		**Walk Rest Mode**		Yield	
Permanent Limit	2		**Permanent 2 Start**			0		**Permanent 2 End**			0					
Alternate Sequence	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**								
									TOD Link		0					
Trans Mode	Default		**Offset Refresh**			Default		**Adapt Mode**			Disable					
Phase	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Coord Phases		X				X										
No Extend																
Float Enable		X		X		X										
Veh=Ped Permissive		X		X		X										
Walk Rest		X				X										
Ped Recall																
Cond Ped Call																
Olap Ped Recall																
Ped Recycle																
Min Recall																
Max Recall																
Cond Service																
Reservice																
Veh Omit																
Ped Omit																
Olap Omit																
Perm Reserve																
Perm1 Phases																
Max Inhibit																
FYA Omit																
Adapt Phs																
FYA Adapt																
FYA Red Rest																

Controller Database Configuration: 1630: D4-DOUGALL-ROSELAND-
2026-03-04 from 12:00 AM to 11:59 PM

Control Configuration

Pattern Mode	Central															
Man Pattern	0		**Man Offset**		0											
Stop Time	Enable															
Aux Switch	StopTm		**Aux Switch Index**		5											
DLS Mode	D4		**GPS Thresh**		0											
Password Timeout	5															
Phase	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Main Phs Recall																
Main Ped Recall																

File Name: Kennedy Drive and McGregor Boulevard & Roseland Golf Club
Start Date : 2026-03-17
Page No : 1

		Roseland Golf Club Driveway From South					Kennedy Drive E From East					McGregor Boulevard From North					Kennedy Drive W From West					
Start Time	End Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
7:30 AM	7:45 AM	0	0	0	0	0	0	3	0	0	3	0	0	2	0	2	0	3	0	0	3	8
7:45 AM	8:00 AM	0	0	0	0	0	0	5	0	0	5	0	0	3	0	3	0	2	0	0	2	10
8:00 AM	8:15 AM	0	0	0	0	0	0	3	0	0	3	0	0	2	1	3	0	1	0	1	2	8
8:15 AM	8:30 AM	0	0	0	0	0	0	3	0	0	3	0	0	1	1	2	0	1	0	0	1	6
8:30 AM	8:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	1	0	0	1	3
8:45 AM	9:00 AM	0	0	0	0	0	0	3	0	0	3	1	0	3	1	5	1	3	0	0	4	12
9:00 AM	9:15 AM	0	0	0	0	0	0	5	0	0	5	1	0	1	0	2	1	2	0	0	3	10
9:15 AM	9:30 AM	0	0	0	1	1	0	0	0	0	0	0	0	4	2	6	0	4	0	0	4	11
	Grand Total	0	0	0	1	1	0	23	0	0	23	2	0	17	5	24	2	17	0	1	20	68
	Apprch %	0.0	0.0	0.0	100.0		0.0	100.0	0.0	0.0		8.3	0.0	70.8	20.8		10.0	85.0	0.0	5.0		
	Total %	0.0	0.0	0.0	1.5	1.5	0.0	33.8	0.0	0.0	33.8	2.9	0.0	25.0	7.4	35.3	2.9	25.0	0.0	1.5	29.4	
	Peak Hour Total	0	0	0	1	1	0	9	0	0	9	2	0	9	3	14	2	10	0	0	12	36
	Heavys	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
	% Heavys	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	#DIV/0!	4.35	#DIV/0!	#DIV/0!	4.35	0.00	#DIV/0!	0.00	0.00	0.00	0.00	0.00	#DIV/0!	0.00	0.00	1.47

File Name: Kennedy Drive and McGregor Boulevard & Roseland Golf Club
Start Date : 2026-03-17
Page No : 2

		Roseland Golf Club Driveway From South					Kennedy Drive E From East					McGregor Boulevard From North					Kennedy Drive W From West					
Start Time	End Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
3:30 PM	3:45 PM	0	0	0	0	0	0	3	0	0	3	2	0	7	1	10	0	5	0	0	5	18
3:45 PM	4:00 PM	0	0	0	0	0	0	2	1	0	3	4	0	4	0	8	1	6	0	0	7	18
4:00 PM	4:15 PM	0	0	0	0	0	0	6	1	0	7	0	0	3	0	3	0	6	0	0	6	16
4:15 PM	4:30 PM	0	0	0	0	0	0	6	0	0	6	1	0	6	0	7	0	3	0	0	3	16
4:30 PM	4:45 PM	0	0	0	1	1	0	3	0	0	3	2	0	1	0	3	1	5	0	0	6	13
4:45 PM	5:00 PM	0	0	0	0	0	0	3	1	0	4	1	0	1	0	2	1	4	0	0	5	11
5:00 PM	5:15 PM	0	0	0	0	0	0	7	0	0	7	0	0	3	0	3	1	2	0	0	3	13
5:15 PM	5:30 PM	0	0	0	0	0	0	2	0	0	2	1	0	3	0	4	0	5	0	0	5	11
	Grand Total	0	0	0	1	1	0	32	3	0	35	11	0	28	1	40	4	36	0	0	40	116
	Apprch %	0.0	0.0	0.0	100.0		0.0	91.4	8.6	0.0		27.5	0.0	70.0	2.5		10.0	90.0	0.0	0.0		
	Total %	0.0	0.0	0.0	0.9	0.9	0.0	27.6	2.6	0.0	30.2	9.5	0.0	24.1	0.9	34.5	3.4	31.0	0.0	0.0	34.5	
	Peak Hour Total	0	0	0	0	0	0	17	2	0	19	7	0	20	1	28	1	20	0	0	21	68
	Heavys	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
	% Heavys	#DIV/0!	#DIV/0!	#DIV/0!	0.00	0.00	#DIV/0!	0.00	0.00	#DIV/0!	0.00	0.00	#DIV/0!	0.00	0.00	0.00	0.00	2.78	#DIV/0!	#DIV/0!	2.50	0.86

Attachment 4:
Level of Service (LOS) Definitions

Highway Capacity Manual 2010

Signalized intersection level of service (LOS) is defined in terms of a weighted average control delay for the entire intersection. Control delay quantifies the increase in travel time that a vehicle experiences due to the traffic signal control as well as provides a surrogate measure for driver discomfort and fuel consumption. Signalized intersection LOS is stated in terms of average control delay per vehicle (in seconds) during a specified time period (e.g., weekday PM peak hour). Control delay is a complex measure based on many variables, including signal phasing and coordination (i.e., progression of movements through the intersection and along the corridor), signal cycle length, and traffic volumes with respect to intersection capacity and resulting queues. Table 1 summarizes the LOS criteria for signalized intersections, as described in the *Highway Capacity Manual 2010* (Transportation Research Board, 2010).

Table 1. Level of Service Criteria for Signalized Intersections

Level of Service	Average Control Delay (seconds/vehicle)	General Description
A	≤10	Free Flow
B	>10 – 20	Stable Flow (slight delays)
C	>20 – 35	Stable flow (acceptable delays)
D	>35 – 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	>55 – 80	Unstable flow (intolerable delay)
F[1]	>80	Forced flow (congested and queues fail to clear)

Source: *Highway Capacity Manual 2010*, Transportation Research Board, 2010.

1. If the volume-to-capacity (v/c) ratio for a lane group exceeds 1.0 LOS F is assigned to the individual lane group. LOS for overall approach or intersection is determined solely by the control delay.

Unsignalized intersection LOS criteria can be further reduced into three intersection types: all-way stop, two-way stop, and roundabout control. All-way stop and roundabout control intersection LOS is expressed in terms of the weighted average control delay of the overall intersection or by approach. Two-way stop-controlled intersection LOS is defined in terms of the average control delay for each minor-street movement (or shared movement) as well as major-street left-turns. This approach is because major-street through vehicles are assumed to experience zero delay, a weighted average of all movements results in very low overall average delay, and this calculated low delay could mask deficiencies of minor movements. Table 2 shows LOS criteria for unsignalized intersections.

Table 2. Level of Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay (seconds/vehicle)
A	0 – 10
B	>10 – 15
C	>15 – 25
D	>25 – 35
E	>35 – 50
F[1]	>50

Source: *Highway Capacity Manual 2010*, Transportation Research Board, 2010.

1. If the volume-to-capacity (v/c) ratio exceeds 1.0, LOS F is assigned an individual lane group for all unsignalized intersections, or minor street approach at two-way stop-controlled intersections. Overall intersection LOS is determined solely by control delay.

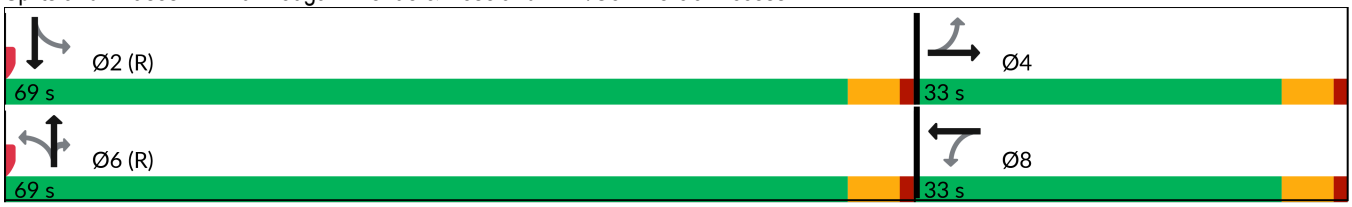
Attachment 5:
Synchro Analysis Worksheets

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	7	9	18	5	17	9	886	49	21	503	16
Future Volume (vph)	54	7	9	18	5	17	9	886	49	21	503	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.2	3.8	3.8	3.9	3.8	3.8	3.0	3.6	3.7	2.9	3.6	3.7
Storage Length (m)	30.0		0.0	0.0		0.0	60.0		80.0	47.0		0.0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00				0.99		1.00				1.00	
Frt		0.917			0.883				0.850		0.995	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1725	1781	0	1760	1619	0	1685	3539	1601	1585	3455	0
Flt Permitted	0.742			0.746			0.443			0.288		
Satd. Flow (perm)	1344	1781	0	1382	1619	0	784	3539	1601	481	3455	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			18				53		6	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		104.2			47.1			90.5			375.1	
Travel Time (s)		9.4			4.2			6.5			27.0	
Confl. Peds. (#/hr)	2					2	2					2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	6%	0%	6%	0%	2%	2%	5%	4%	0%
Adj. Flow (vph)	58	8	10	19	5	18	10	953	53	23	541	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	58	18	0	19	23	0	10	953	53	23	558	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6		6	2		
Detector Phase	4	4		8	8		6	6	6	2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	28.0	28.0		28.0	28.0		27.0	27.0	27.0	27.0	27.0	
Total Split (s)	33.0	33.0		33.0	33.0		69.0	69.0	69.0	69.0	69.0	
Total Split (%)	32.4%	32.4%		32.4%	32.4%		67.6%	67.6%	67.6%	67.6%	67.6%	
Maximum Green (s)	28.0	28.0		28.0	28.0		64.0	64.0	64.0	64.0	64.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	
Flash Don't Walk (s)	16.0	16.0		16.0	16.0		15.0	15.0	15.0	15.0	15.0	
Pedestrian Calls (#/hr)	0	0		2	2		0	0	0	2	2	
Act Effct Green (s)	13.2	13.2		13.2	13.2		82.8	82.8	82.8	82.8	82.8	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.81	0.81	0.81	0.81	0.81	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.33	0.08		0.11	0.10		0.02	0.33	0.04	0.06	0.20	
Control Delay (s/veh)	43.8	23.8		37.6	18.9		4.1	4.1	1.4	4.4	3.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay (s/veh)	43.8	23.8		37.6	18.9		4.1	4.1	1.4	4.4	3.5	
LOS	D	C		D	B		A	A	A	A	A	
Approach Delay (s/veh)		39.1			27.4			4.0			3.5	
Approach LOS		D			C			A			A	
Queue Length 50th (m)	10.9	1.5		3.6	0.9		0.3	21.6	0.0	0.8	11.1	
Queue Length 95th (m)	20.1	6.8		9.4	7.1		2.2	50.5	3.6	4.3	27.4	
Internal Link Dist (m)		80.2			23.1			66.5			351.1	
Turn Bay Length (m)	30.0						60.0		80.0	47.0		
Base Capacity (vph)	368	496		379	457		636	2871	1309	390	2804	
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	0.16	0.04		0.05	0.05		0.02	0.33	0.04	0.06	0.20	

Intersection Summary			
Area Type:	Other		
Cycle Length: 102			
Actuated Cycle Length: 102			
Offset: 23 (23%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.33			
Intersection Signal Delay (s/veh): 6.0		Intersection LOS: A	
Intersection Capacity Utilization 42.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 110: Dougall Avenue & Roseland Dr E/Commercial Access

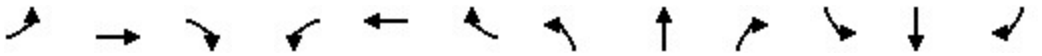


Intersection	
Intersection Delay, s/veh	7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	11	2	7	13	0	1	0	3	2	5	11
Future Vol, veh/h	2	11	2	7	13	0	1	0	3	2	5	11
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Heavy Vehicles, %	0	0	0	0	8	0	0	0	0	0	0	0
Mvmt Flow	3	15	3	9	17	0	1	0	4	3	7	15
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	7	7.2	6.6	6.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	25%	13%	35%	11%
Vol Thru, %	0%	73%	65%	28%
Vol Right, %	75%	13%	0%	61%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	15	20	18
LT Vol	1	2	7	2
Through Vol	0	11	13	5
RT Vol	3	2	0	11
Lane Flow Rate	5	20	27	24
Geometry Grp	1	1	1	1
Degree of Util (X)	0.005	0.022	0.03	0.024
Departure Headway (Hd)	3.6	3.918	4.036	3.642
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	994	917	890	984
Service Time	1.622	1.929	2.045	1.661
HCM Lane V/C Ratio	0.005	0.022	0.03	0.024
HCM Control Delay, s/veh	6.6	7	7.2	6.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.1	0.1	0.1



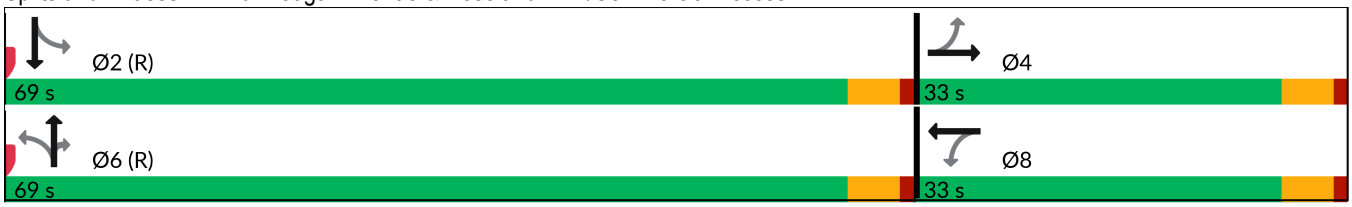
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	7	11	18	5	17	10	886	49	21	503	17
Future Volume (vph)	60	7	11	18	5	17	10	886	49	21	503	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.2	3.8	3.8	3.9	3.8	3.8	3.0	3.6	3.7	2.9	3.6	3.7
Storage Length (m)	30.0		0.0	0.0		0.0	60.0		80.0	47.0		0.0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	1.00				0.99		1.00				1.00	
Frt		0.910			0.883				0.850		0.995	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1725	1767	0	1760	1619	0	1685	3539	1601	1585	3455	0
Flt Permitted	0.742			0.744			0.442			0.288		
Satd. Flow (perm)	1344	1767	0	1378	1619	0	782	3539	1601	481	3455	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			18				53		6	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		104.2			47.1			90.5			375.1	
Travel Time (s)		9.4			4.2			6.5			27.0	
Confl. Peds. (#/hr)	2					2	2					2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	6%	0%	6%	0%	2%	2%	5%	4%	0%
Adj. Flow (vph)	65	8	12	19	5	18	11	953	53	23	541	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	65	20	0	19	23	0	11	953	53	23	559	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6		6	2		
Detector Phase	4	4		8	8		6	6	6	2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	28.0	28.0		28.0	28.0		27.0	27.0	27.0	27.0	27.0	
Total Split (s)	33.0	33.0		33.0	33.0		69.0	69.0	69.0	69.0	69.0	
Total Split (%)	32.4%	32.4%		32.4%	32.4%		67.6%	67.6%	67.6%	67.6%	67.6%	
Maximum Green (s)	28.0	28.0		28.0	28.0		64.0	64.0	64.0	64.0	64.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	
Flash Don't Walk (s)	16.0	16.0		16.0	16.0		15.0	15.0	15.0	15.0	15.0	
Pedestrian Calls (#/hr)	0	0		2	2		0	0	0	2	2	
Act Effct Green (s)	13.5	13.5		13.5	13.5		82.5	82.5	82.5	82.5	82.5	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.81	0.81	0.81	0.81	0.81	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.37	0.08		0.10	0.10		0.02	0.33	0.04	0.06	0.20	
Control Delay (s/veh)	44.6	22.6		37.3	18.8		4.2	4.2	1.4	4.5	3.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay (s/veh)	44.6	22.6		37.3	18.8		4.2	4.2	1.4	4.5	3.6	
LOS	D	C		D	B		A	A	A	A	A	
Approach Delay (s/veh)		39.5			27.2			4.1			3.6	
Approach LOS		D			C			A			A	
Queue Length 50th (m)	12.2	1.4		3.6	0.9		0.4	22.4	0.0	0.8	11.5	
Queue Length 95th (m)	22.2	7.3		9.4	7.1		2.3	50.5	3.6	4.3	27.4	
Internal Link Dist (m)		80.2			23.1			66.5			351.1	
Turn Bay Length (m)	30.0						60.0		80.0	47.0		
Base Capacity (vph)	368	493		378	457		632	2864	1305	389	2797	
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	0.18	0.04		0.05	0.05		0.02	0.33	0.04	0.06	0.20	

Intersection Summary

Area Type: Other
Cycle Length: 102
Actuated Cycle Length: 102
Offset: 23 (23%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.37
Intersection Signal Delay (s/veh): 6.2 Intersection LOS: A
Intersection Capacity Utilization 42.8% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 110: Dougall Avenue & Roseland Dr E/Commercial Access

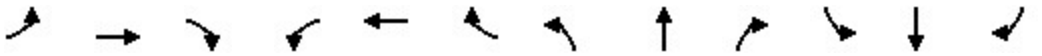


Intersection	
Intersection Delay, s/veh	7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	15	1	2	21	0	4	0	8	2	1	16
Future Vol, veh/h	2	15	1	2	21	0	4	0	8	2	1	16
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Heavy Vehicles, %	0	0	0	0	8	0	0	0	0	0	0	0
Mvmt Flow	3	20	1	3	28	0	5	0	11	3	1	21
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	7.1	7.2	6.8	6.6
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	33%	11%	9%	11%
Vol Thru, %	0%	83%	91%	5%
Vol Right, %	67%	6%	0%	84%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	12	18	23	19
LT Vol	4	2	2	2
Through Vol	0	15	21	1
RT Vol	8	1	0	16
Lane Flow Rate	16	24	31	25
Geometry Grp	1	1	1	1
Degree of Util (X)	0.016	0.027	0.034	0.025
Departure Headway (Hd)	3.68	3.984	4.008	3.521
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	971	901	896	1015
Service Time	1.707	1.998	2.02	1.548
HCM Lane V/C Ratio	0.016	0.027	0.035	0.025
HCM Control Delay, s/veh	6.8	7.1	7.2	6.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.1	0.1	0.1

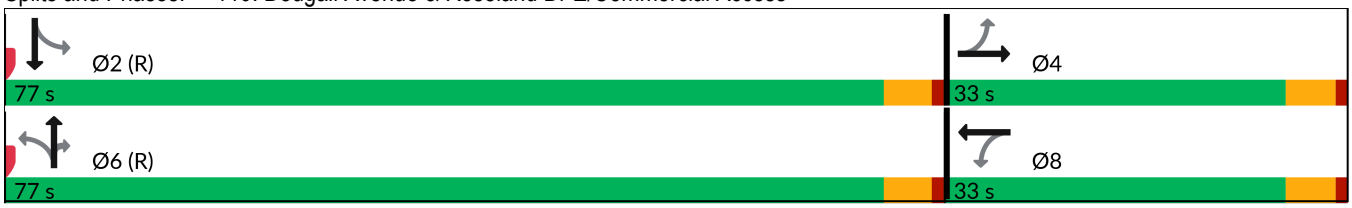


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	9	10	76	10	35	9	687	44	63	884	54
Future Volume (vph)	46	9	10	76	10	35	9	687	44	63	884	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.2	3.8	3.8	3.9	3.8	3.8	3.0	3.6	3.7	2.9	3.6	3.7
Storage Length (m)	30.0		0.0	0.0		0.0	60.0		80.0	47.0		0.0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt		0.921			0.884				0.850		0.991	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1691	1691	0	1865	1717	0	1685	3574	1633	1665	3544	0
Flt Permitted	0.725			0.744			0.266			0.362		
Satd. Flow (perm)	1290	1691	0	1461	1717	0	472	3574	1633	634	3544	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			38				48		12	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		104.2			47.1			90.5			375.1	
Travel Time (s)		9.4			4.2			6.5			27.0	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	0%	11%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Adj. Flow (vph)	51	10	11	84	11	38	10	755	48	69	971	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	51	21	0	84	49	0	10	755	48	69	1030	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6		6	2		
Detector Phase	4	4		8	8		6	6	6	2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	28.0	28.0		28.0	28.0		27.0	27.0	27.0	27.0	27.0	
Total Split (s)	33.0	33.0		33.0	33.0		77.0	77.0	77.0	77.0	77.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%		70.0%	70.0%	70.0%	70.0%	70.0%	
Maximum Green (s)	28.0	28.0		28.0	28.0		72.0	72.0	72.0	72.0	72.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	
Flash Don't Walk (s)	16.0	16.0		16.0	16.0		15.0	15.0	15.0	15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	
Act Effct Green (s)	12.4	12.4		12.4	12.4		91.6	91.6	91.6	91.6	91.6	
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.83	0.83	0.83	0.83	0.83	
v/c Ratio	0.35	0.11		0.51	0.22		0.03	0.25	0.04	0.13	0.35	
Control Delay (s/veh)	50.9	28.6		56.3	20.0		3.1	3.0	1.0	3.6	3.4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay (s/veh)	50.9	28.6		56.3	20.0		3.1	3.0	1.0	3.6	3.4	
LOS	D	C		E	B		A	A	A	A	A	
Approach Delay (s/veh)		44.4			42.9			2.9			3.4	
Approach LOS		D			D			A			A	
Queue Length 50th (m)	10.5	2.0		17.4	2.2		0.3	16.8	0.0	2.6	25.1	
Queue Length 95th (m)	21.6	8.9		31.5	12.7		1.7	28.4	2.5	7.3	41.6	
Internal Link Dist (m)		80.2			23.1			66.5			351.1	
Turn Bay Length (m)	30.0						60.0		80.0	47.0		
Base Capacity (vph)	328	438		371	465		392	2974	1367	527	2951	
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	0.16	0.05		0.23	0.11		0.03	0.25	0.04	0.13	0.35	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 92 (84%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.51			
Intersection Signal Delay (s/veh): 7.1		Intersection LOS: A	
Intersection Capacity Utilization 57.9%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 110: Dougall Avenue & Roseland Dr E/Commercial Access

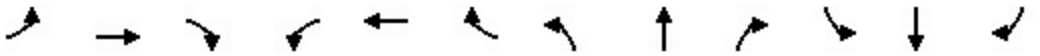


Intersection	
Intersection Delay, s/veh	7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	26	2	8	21	2	2	0	12	7	5	22
Future Vol, veh/h	1	26	2	8	21	2	2	0	12	7	5	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	4	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	1	28	2	9	23	2	2	0	13	8	5	24
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	7.1	7.2	6.6	6.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	14%	3%	26%	21%
Vol Thru, %	0%	90%	68%	15%
Vol Right, %	86%	7%	6%	65%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	14	29	31	34
LT Vol	2	1	8	7
Through Vol	0	26	21	5
RT Vol	12	2	2	22
Lane Flow Rate	15	32	34	37
Geometry Grp	1	1	1	1
Degree of Util (X)	0.015	0.035	0.038	0.038
Departure Headway (Hd)	3.555	3.983	4.029	3.678
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	1003	900	890	972
Service Time	1.589	2.001	2.046	1.708
HCM Lane V/C Ratio	0.015	0.036	0.038	0.038
HCM Control Delay, s/veh	6.6	7.1	7.2	6.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.1	0.1	0.1

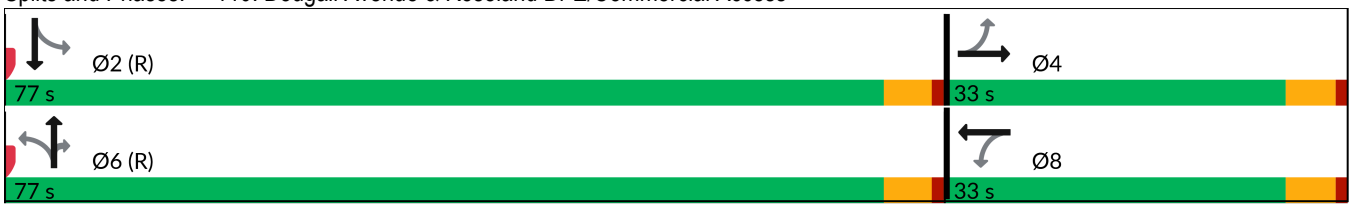


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	9	12	76	10	35	11	687	44	63	884	57
Future Volume (vph)	49	9	12	76	10	35	11	687	44	63	884	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.2	3.8	3.8	3.9	3.8	3.8	3.0	3.6	3.7	2.9	3.6	3.7
Storage Length (m)	30.0		0.0	0.0		0.0	60.0		80.0	47.0		0.0
Storage Lanes	1		0	1		0	1		1	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt		0.915			0.884				0.850		0.991	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1691	1673	0	1865	1717	0	1685	3574	1633	1665	3544	0
Flt Permitted	0.725			0.742			0.265			0.362		
Satd. Flow (perm)	1290	1673	0	1457	1717	0	470	3574	1633	634	3544	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			38				48		12	
Link Speed (k/h)		40			40			50			50	
Link Distance (m)		104.2			47.1			90.5			375.1	
Travel Time (s)		9.4			4.2			6.5			27.0	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	2%	0%	11%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Adj. Flow (vph)	54	10	13	84	11	38	12	755	48	69	971	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	54	23	0	84	49	0	12	755	48	69	1034	0
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6		6	2		
Detector Phase	4	4		8	8		6	6	6	2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	28.0	28.0		28.0	28.0		27.0	27.0	27.0	27.0	27.0	
Total Split (s)	33.0	33.0		33.0	33.0		77.0	77.0	77.0	77.0	77.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%		70.0%	70.0%	70.0%	70.0%	70.0%	
Maximum Green (s)	28.0	28.0		28.0	28.0		72.0	72.0	72.0	72.0	72.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	
Flash Don't Walk (s)	16.0	16.0		16.0	16.0		15.0	15.0	15.0	15.0	15.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	
Act Effct Green (s)	12.4	12.4		12.4	12.4		91.6	91.6	91.6	91.6	91.6	
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.83	0.83	0.83	0.83	0.83	
v/c Ratio	0.37	0.12		0.51	0.22		0.03	0.25	0.04	0.13	0.35	
Control Delay (s/veh)	51.7	27.1		56.4	20.0		3.2	3.0	1.0	3.6	3.4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay (s/veh)	51.7	27.1		56.4	20.0		3.2	3.0	1.0	3.6	3.4	
LOS	D	C		E	B		A	A	A	A	A	
Approach Delay (s/veh)		44.3			43.0			2.9			3.4	
Approach LOS		D			D			A			A	
Queue Length 50th (m)	11.2	2.0		17.4	2.2		0.4	16.8	0.0	2.6	25.3	
Queue Length 95th (m)	22.7	9.1		31.5	12.7		2.0	28.4	2.5	7.3	41.7	
Internal Link Dist (m)		80.2			23.1			66.5			351.1	
Turn Bay Length (m)	30.0						60.0		80.0	47.0		
Base Capacity (vph)	328	435		370	465		391	2974	1367	527	2951	
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	0.16	0.05		0.23	0.11		0.03	0.25	0.04	0.13	0.35	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 92 (84%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.51			
Intersection Signal Delay (s/veh): 7.2		Intersection LOS: A	
Intersection Capacity Utilization 58.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 110: Dougall Avenue & Roseland Dr E/Commercial Access



Intersection	
Intersection Delay, s/veh	7.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	38	3	5	29	2	2	0	5	7	3	28
Future Vol, veh/h	1	38	3	5	29	2	2	0	5	7	3	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	4	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	1	41	3	5	32	2	2	0	5	8	3	30
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	7.2	7.2	6.8	6.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	29%	2%	14%	18%
Vol Thru, %	0%	90%	81%	8%
Vol Right, %	71%	7%	6%	74%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	7	42	36	38
LT Vol	2	1	5	7
Through Vol	0	38	29	3
RT Vol	5	3	2	28
Lane Flow Rate	8	46	39	41
Geometry Grp	1	1	1	1
Degree of Util (X)	0.008	0.05	0.044	0.042
Departure Headway (Hd)	3.708	3.978	4.015	3.648
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	961	901	893	978
Service Time	1.747	1.997	2.035	1.684
HCM Lane V/C Ratio	0.008	0.051	0.044	0.042
HCM Control Delay, s/veh	6.8	7.2	7.2	6.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.2	0.1	0.1