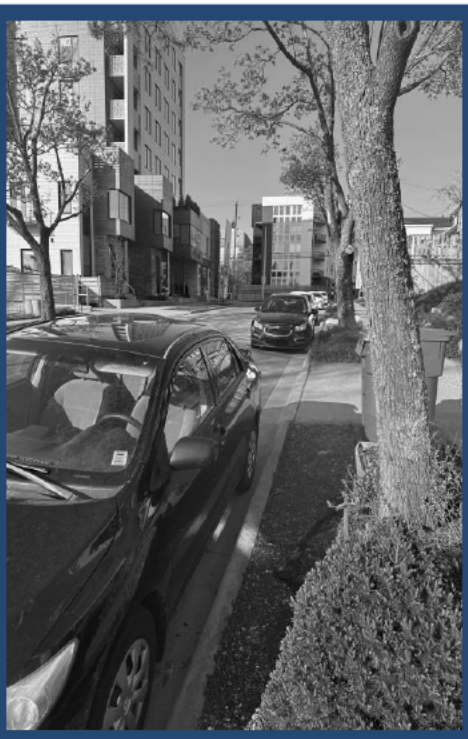

Traffic Impact Study

May 17, 2024

United Memorial Redevelopment

DP Project #24-264 - Engineering Services

SUBMITTED BY:

DesignPoint Engineering & Surveying Ltd.

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1.0 INTRODUCTION

1.1 PROJECT OVERVIEW

Design Point Engineering & Surveying Ltd. has been engaged to conduct a traffic impact study for the proposed redevelopment of United Memorial Church located at 5375 Kaye Street in Halifax, Nova Scotia. The first proposed option would retain the performance venue (Sanctuary) and add 60 dwelling units. The second option would replace the performance venue and add 78 dwelling units.

For the purpose of this traffic study, we are reviewing 2 scenarios with the greatest number of new residential units.

The site will have underground parking and a single driveway access off Young Street. For both options there will be a minimum of 13 parking spaces and a maximum of 26 parking spaces. The final number will depend on the geotechnical conditions at the site.

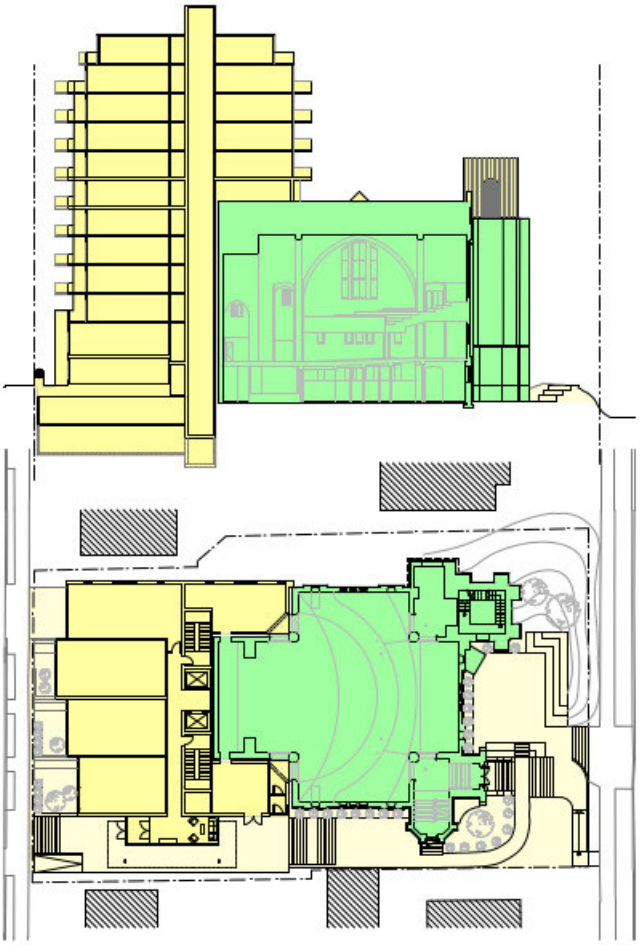


Figure 1:Proposed Design Strategy

1.2 STUDY AREA

The site is located mid-block, approximately 190 m to the east of Gottingen Street, and approximately 140 m to the west of Devonshire Avenue.

The site address has a walk score of 91 (Walkers Paradise), a transit score of 64 (Good Transit), and a bike score of 54 (Some bike infrastructure,)[1]

As per conversations with the HRM, the Young Street corridor, from Gottingen Street to Barrington Street, has been included in the traffic analysis.

[1] Source: Walkscore.com

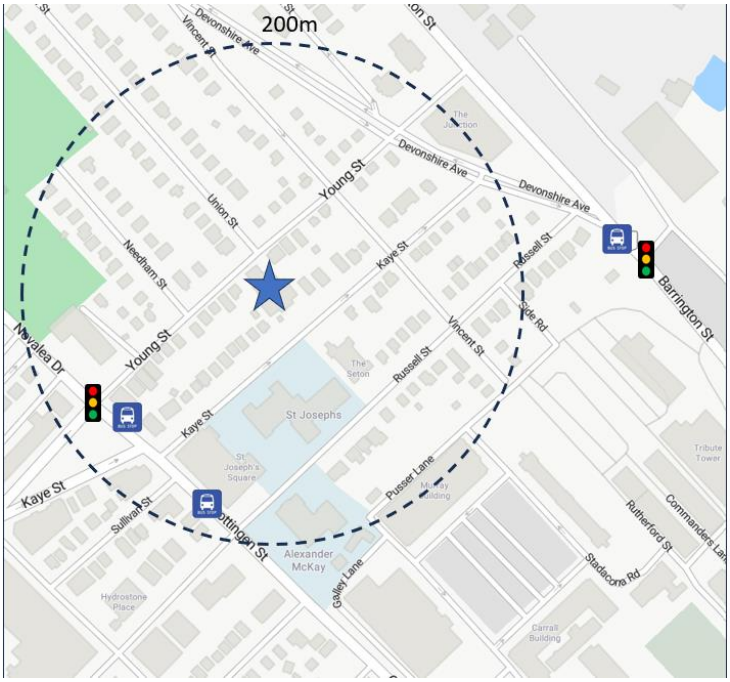


Figure 2 : Study Area

Young Street

The section of Young Street, from Gottingen Street to Barrington Street, is a two-lane minor collector street with a posted speed of 50 km/h. There are sidewalks on both sides of the street.

Figure 3 - Young Street looking towards Barrington Street

Devonshire Avenue

Devonshire Avenue is a two-lane divided minor collector. The street has sidewalks on both sides and on-street bike lanes in both directions. At the Young Street intersection, there is an RA-5 cross walk.

Figure 4: Devonshire Avenue looking towards Barrington Street

Intersection of Young Street at Devonshire Avenue

The intersection of Young Street and Devonshire Avenue is a four-leg unsignalized intersection with stop control on Young Street. There are no turning lanes, and there is a single zebra crosswalk crossing Devonshire Avenue.

Figure 5: Intersection of Young Street at Devonshire Avenue

1.3 TRANSIT

Halifax Transit provides service on Barrington Street and Gottingen Street. The figures below show the nearby transit routes in this area.

Figure 6: Transit Routes

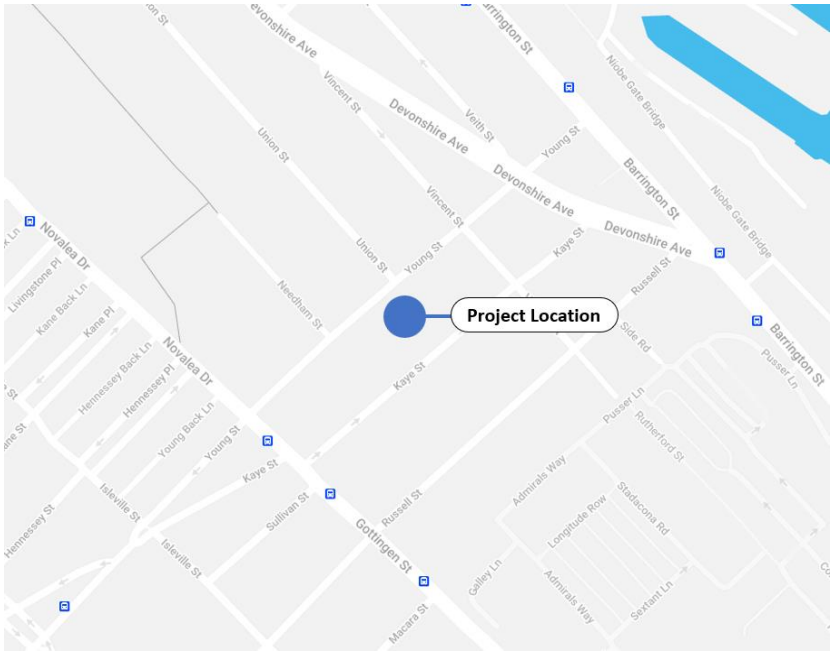


Figure 7: Transit Routes

2.0 2024 EXISTING CONDITIONS

2.1 EXISTING TRAFFIC VOLUMES

Traffic data for the Young Street at Barrington Street intersection was collected on Tuesday, May 7th using the Miovision hardware and software. Traffic volume data were collected for the AM and PM peak periods (7-9 AM, and 4-6 PM). Traffic volume data for the Young Street at Gottingen Street intersection was obtained from HRM. The traffic count was collected on Wednesday, November 23, 2022 and included the AM and PM peak hour periods.

The Barrington and Gottingen Street traffic volumes were adjusted using the Halifax Harbour Bridge factors obtained from HRM. The Gottingen Street traffic volumes were increased by a factor of 1.04 (2% per year) to align with the 2024 traffic count data. The intersection Peak Hour Factors (PHF) for the two intersections ranged from 0.908 to 0.959. The lower number represents a more conservative approach, and it was used in the analysis.

Traffic volume data for the Young Street at Devonshire intersection was also collected from HRM. The traffic count data was collected on Wednesday, August 30, 2017 and included AM and PM peak periods. These counts were adjusted using the Barrington and Gottingen count data.

A summary of the existing traffic volumes is shown in Figure 6

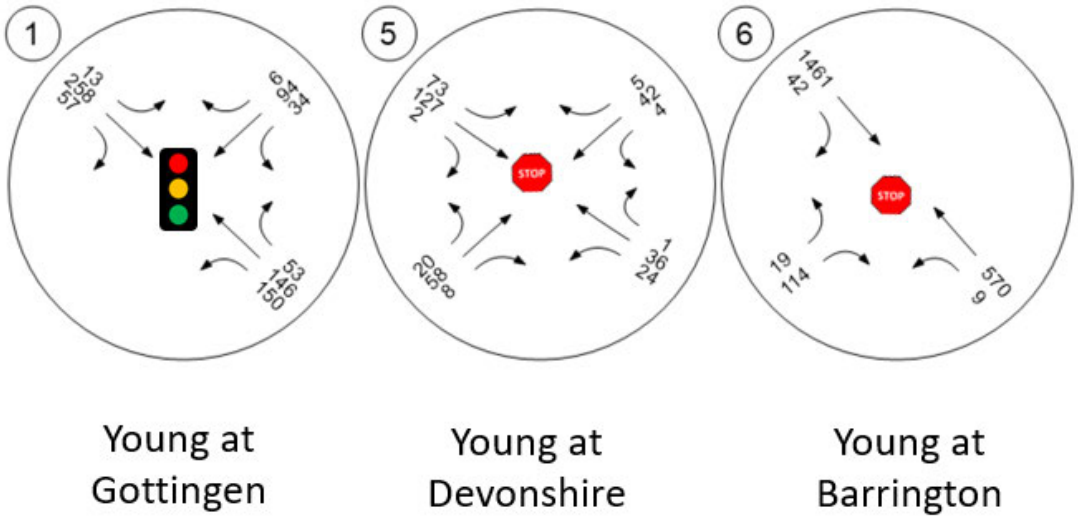


Figure 8:Existing AM Peak Traffic Volumes (adjusted)

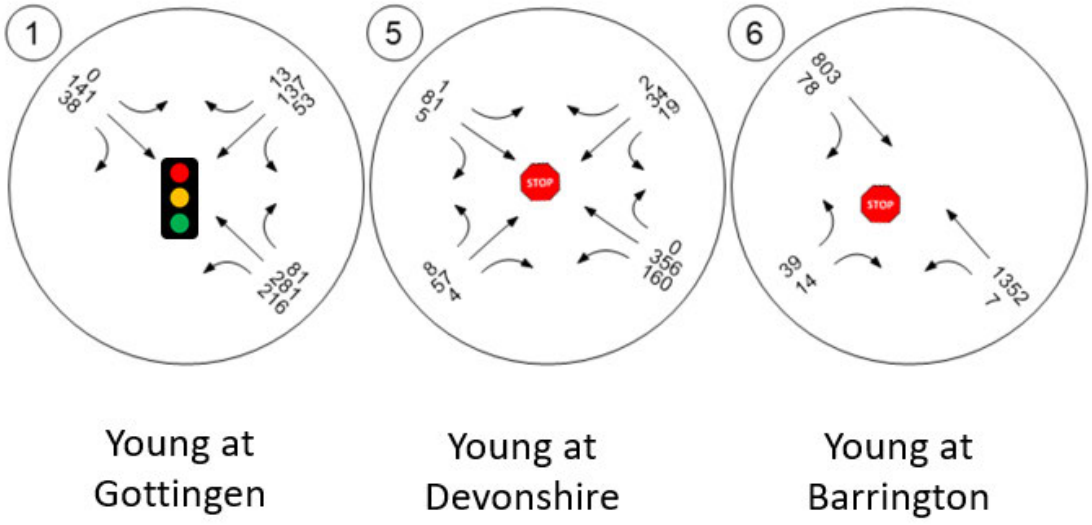


Figure 9: Existing PM Peak Hour Volumes (Adjusted)

2.2 EXISTING TRAFFIC OPERATIONS

Speed data on Kaye Street, collected by HRM in November 2021 indicates that the average travel speed just east of Gottingen was 50 km/h. The 85th percentile speed was estimated at 55 km/h[2]. It was assumed that the 85th percentile for Young Street was also 55 km/h.

The level of service (LOS) analysis is a method to determine how well a transportation facility, typically an intersection, performs from a driver's perspective during a specified period (usually peak hours). The LOS is a measure of the average delay of each vehicle travelling through an intersection with grades ranging from 'A' to 'F'. 'A' is associated with minimal delay, and 'F' is associated with heavily congested conditions with unacceptable delays for drivers. The desired or acceptable level of service can vary depending on the location and context of individual streets. For this study, the LOS limit for an intersection is 'E' and individual movements 'F' and the volume-to-capacity ratio thresholds are 0.85 for shared movements and 1.0 for dedicated turn lanes. Table 1 provides the LOS criteria defined by the *Highway Capacity Manual* for signalized and stop controlled intersections.

[2] Source: 21SPD337

Table 1: LOS Analysis

Level of Service Thresholds for Signalized Intersection		
Level of Service	Average Control Delay (seconds per 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[3]	> 80	Forced flow (congested and queues fail to clear)

Table 2: LOS Analysis

Level of Service Thresholds for Stop Controlled Intersections	
Level of Service	Average Control Delay (seconds per vehicle
A	<10
B	>10-15
C	>15-25
D	>25-35
E	>35-50
F	>50

The traffic analysis was completed using PTV VISTRO traffic modelling software. A summary of the AM and PM peak hour level of service measures is provided in Table 2. The PTV VISTRO reports are provided in Appendix C. The analysis shows no existing operational concerns with the intersection's operation in isolation.

[3] If the volume-to-capacity ratio for a lane group exceeds 1.0, LOS 'F' is assigned to the individual lane group. LOS for an overall approach or an intersection is determined solely by the control delay.

Table 3: Existing Traffic LOS Analysis- Young at Gottingen/Novalea

AM Peak Hour - Existing Traffic Volumes											
LOS Criteria	Intersection Control	Young Street			Novalea			Gottingen Street			
		NBL	NBT	NBR	SBL	SBT	SBR	WBL	WBT	WBR	Intersection
Vehicle Count		175	171	64	15	302	66	46	113	7	
v/c		0.29	0.22		0.27		0.07	0.63			
Delay (s)		9.09	4.6		4.91		3.23	26.17			9.2
LOS		A	A		A		A	C			A
95th% Queue (m)		16.8	12.4		17.3		3.1	30.7			
PM Peak Hour - Existing Traffic Volumes											
LOS Criteria	Intersection Control	Young Street			Novalea			Gottingen Street			
		NBL	NBT	NBR	SBL	SBT	SBR	WBL	WBT	WBR	Intersection
Vehicle Count		252	328	97	0	164	44	68	163	15	
v/c		0.36	0.41		0.15		0.05	0.82			
Delay (s)		9.19	6.71		4.74		4.26	28.97			11.72
LOS		A	A		A		A	C			B
95th% Queue (m)		24.1	29.9		9.1		2.3	48.7			

Table 4:Existing LOS Analysis- Devonshire at Young

AM Peak Hour - Existing Traffic Volumes														
LOS Criteria	Intersection Control	Devonshire			Devonshire			Young Street			Young Street			
		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Intersection
Vehicle Count		29	40	1	80	140	2	23	65	15	4	46	6	
v/c		0.02			0.05			0.05	0.13	0.02	0.01	0.09	0.01	
Delay (s)		7.54			7.39			14.64	13.93	10.67	14.37	13.07	9.33	6.49
LOS		A			A			B	B	B	B	B	A	B
95th% Queue (m)		0.38			1.07			5.56			2.74			
PM Peak Hour - Existing Traffic Volumes														
LOS Criteria	Intersection Control	Devonshire			Devonshire			Young Street			Young Street			
		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Intersection
Vehicle Count		178	392	0	1	89	6	10	64	11	24	37	2	
v/c		0.12			0.00			0.05	0.25	0.01	0.12	0.15	0.00	
Delay (s)		1.16			8.09			28.57	24.99	14.60	31.44	25.02	16.32	6.2
LOS		A			A			D	C	B	D	D	C	D
95th% Queue (m)		2.50			0.01			9.81			8.00			

Table 5: Existing Traffic Volumes

AM Peak Hour - Existing Traffic Volumes											
LOS Criteria	Intersection Control	Barrington			Barrington			Young Street			
		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	Intersection
Vehicle Count	STOP	10	640			1641	47	22		128	
v/c		0.03				0.0		0.6		1.07	
Delay (s)		14.53				0		459		392	24.55
LOS		A	A			A	A	F		F	F
95th% Queue (m)		0.13	0.13			0.0	0.0	406.0		406.0	
PM Peak Hour - Existing Traffic Volumes											
LOS Criteria	Intersection Control	Barrington			Barrington			Young Street			
		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	Intersection
Vehicle Count	STOP	8	1489			884	86	39		15	
v/c		0.01				0.0		1.34		0.05	
Delay (s)		10.1				0		449		350	9.92
LOS		B	A			A	A	F		F	F
95th% Queue (m)		0.05	0.05			0.0	0.0	44.6		44.6	

2.3 ON STREET PARKING

Observations of on-Street parking usage for both Young Street and Kaye Street, from Gottingen Street to Devonshire Avenue was collected on Wednesday, May 1st & Monday May 13th, 2024. Samples were taken during the AM, lunch hour, PM peak hour periods and the evening period.

The proposed site is within Residential Parking Zone G.[4] Residents are eligible for an Annual Resident Parking Permit if they reside within the zone in a property with no more than four (4) dwelling units.

On Young Street, from Gottingen Street to Barrington Street, there is no parking permitted on the south side. Portions of the north side of the street permits 1 hr parking from 8am -6pm Monday to Friday.

On Kaye Street, there is no parking permitted, Monday to Friday, from 8am to 6pm on both sides of the street. There are pockets of 2-hour parking.

The following tables show the approximate parking utilization that was observed on both streets during site visits.

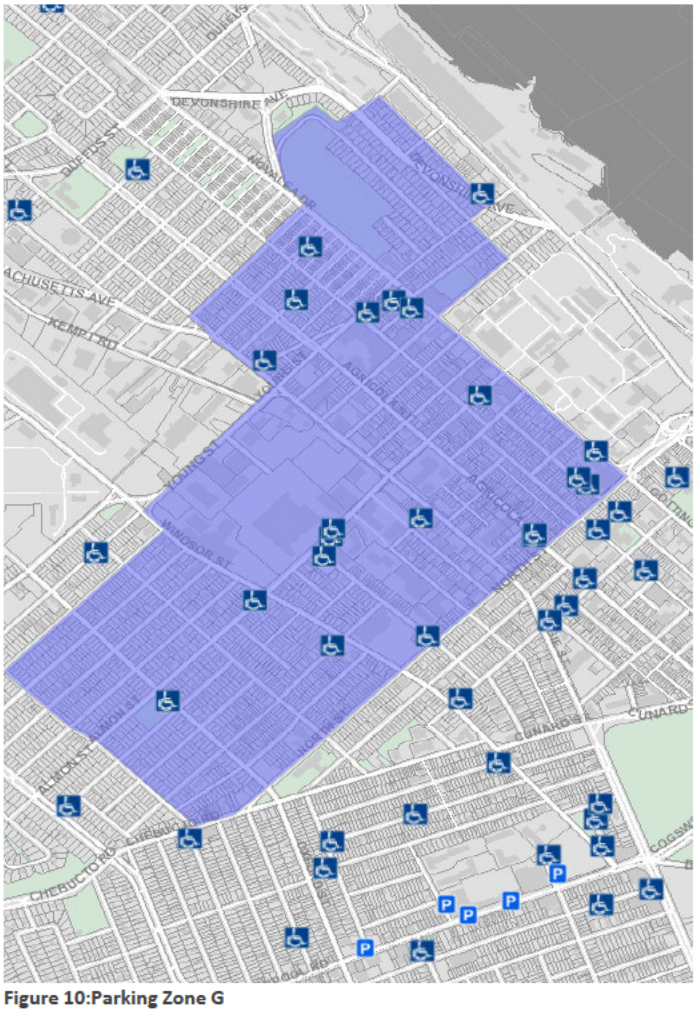


Figure 10:Parking Zone G

[4] Source: hrmmaps.arcgis.com

Table 6: Utilization percentages on Kaye Street (between Gottingen and Devonshire)

Study times	7-9am	11am-1pm	4-6pm	6pm+
Number of vehicles observed	20	18	15	5
Estimated total on-street parking spaces	23		46	
Utilization (%)	87	78	33	10

Table 7: Utilization percentages on Young Street (between Gottingen and Devonshire)

Study times	7-9am	11am-1pm	4-6pm	6pm+
Number of vehicles observed	8	5	10	3
Estimated total on-street parking spaces	16		34	
Utilization (%)	50	31	29	8

These observations indicate a high level of parking utilization on Kaye Street during the morning and afternoon and readily available parking supply during the evenings. Young Street's observations indicate parking availability throughout the day.

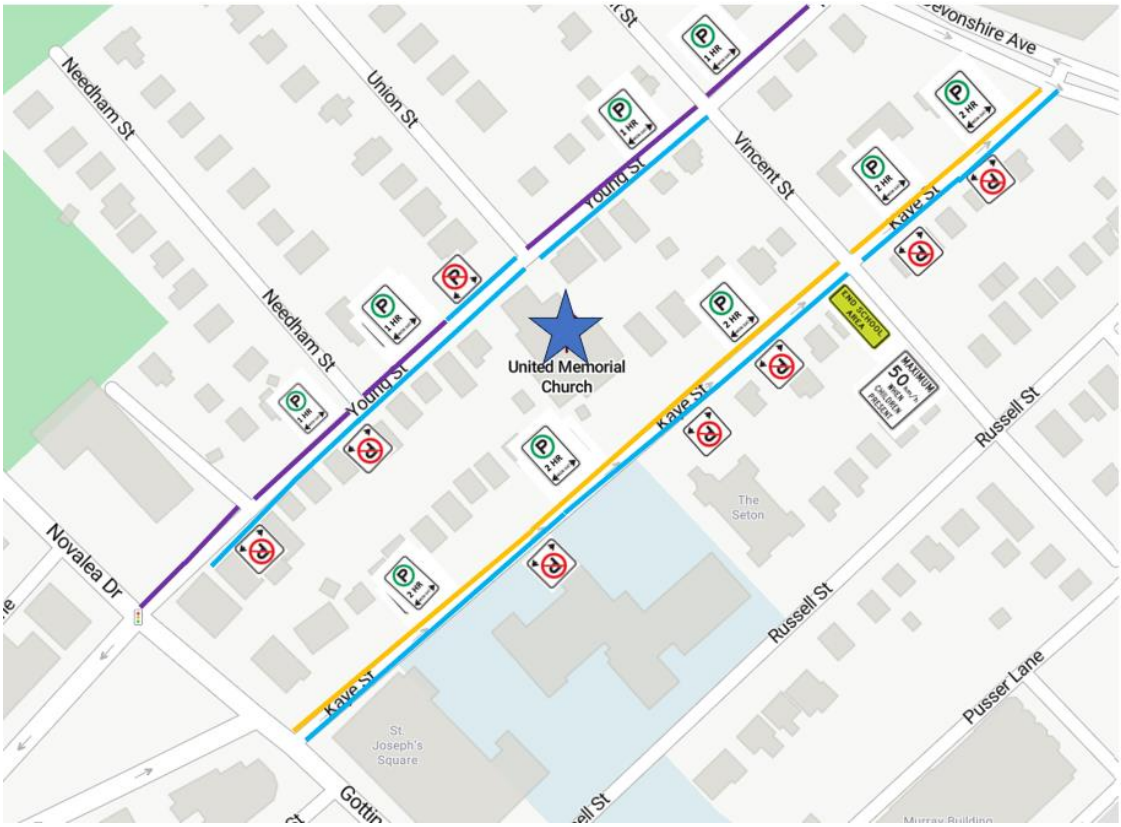


Figure 11: Illustrating Parking restrictions on Kaye and Young Street

Legend

No Parking 8am -6pm Monday-Friday

1 hour parking 8am-6pm Mon-Fri

2-hour parking 8am-6pm Mon-Fri

Area of interest for the study

1-hour parking time block

2-hour parking time block

No Parking time block

3.0 DEVELOPMENT TRAFFIC

3.1 ACCESS REVIEW

The proposed site plan has one driveway on Young Street.

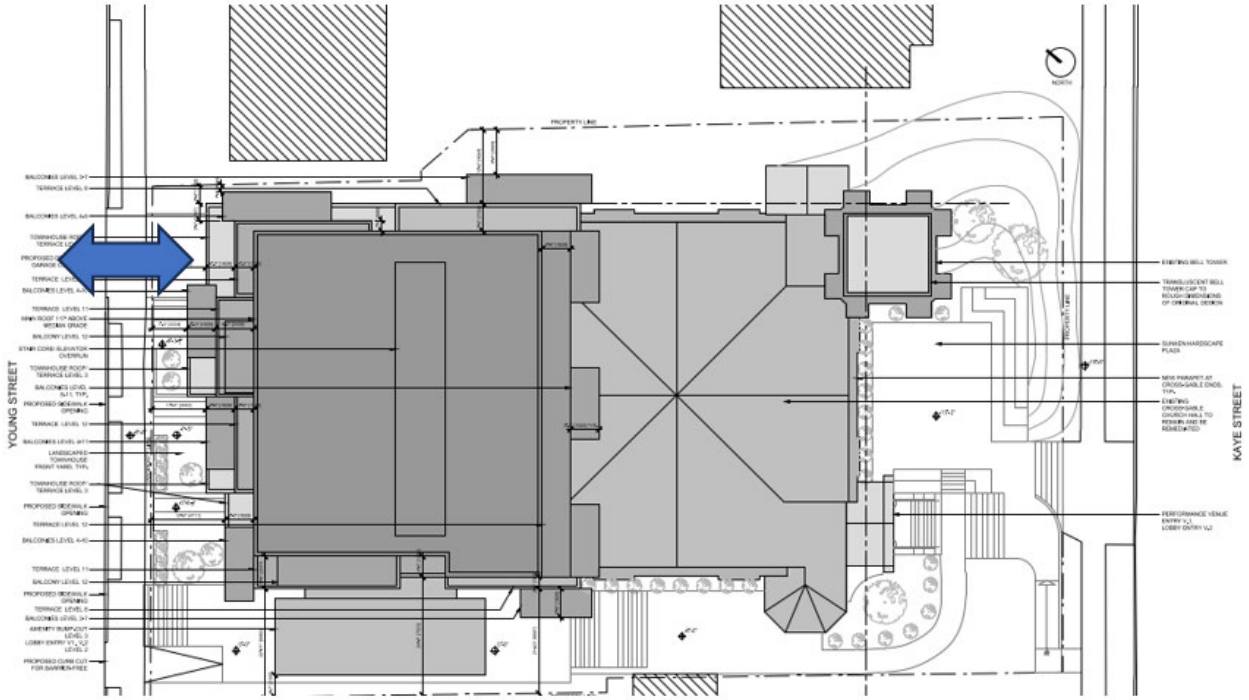


Figure 12: Proposed Site Plan

Stopping Sight Distance

Stopping sight distance is the minimum requirement for sight distances at driveways and intersections. Stopping sight distance is the distance a vehicle takes to avoid encountering an obstacle at the relative speed. It is the combination of the distance travelled during the perception and reaction time, the time it takes a driver to determine the need to stop, and the braking distance, which is the distance travelled once the brakes are applied to when the vehicle comes to a stop.

The *HRM Municipal Design Guidelines* (2021) requires local roads (and driveways) to have a stopping sight distance (SSD) of 65 metres. This is consistent with the Transportation Association of Canada Design Guidelines for a 50 km/h design speed. When adjusted for grade (6-9%) and the 85th percentile speed of 55 km/h, the minimum required stopping sight distance is approximately 85 metres. The SSD criteria is meet for the proposed driveway location.

Figure 13: Stopping Sight distance looking West

Figure 14: Stopping sight distance looking East

3.2 ALIGNMENT WITH HRM'S PRIORITIES

The proposed development creates much needed housing to assist with the Municipality's current housing shortage, and it situates this housing to be close to an array of employment and near Barrington Street and Youn Street transit corridors. The design and location of this development promotes the choice of alternate modes of traffic. This reduces the number of vehicles on the roads, mitigating the congestion and emissions created by each potential vehicle.

3.3 SITE GENERATED TRAFFIC

Site generated traffic was calculated using the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 11th Edition. Using dwelling units as the independent variable, the number of person trips were estimated using the fitted curve equation for both the AM and PM peak hour period. While there are two development options proposed, only the worst-case scenario (78 dwelling units and 26 parking spaces) was analyzed for this study.

The development is expected to generate **36 person trips** during both the AM and PM peak hours. Based on the location of the development and proximity to alternate mode choices, we have assumed a 60% non-auto mode choice in line with HRM Integrated Mobility Plan to target for the Regional Centre.

Table 8: LOS Analysis

Land Use	Code	Units	Variable	Trip Generation Rates[1]						Trips Generated			
				AM Peak			PM Peak			AM Peak		PM Peak	
				Rate	In	Out	Rate	In	Out	In	Out	In	Out
Multifamily Housing (Mid-Rise)	221	78	Dwellings	0.46	23%	77%	0.46	61%	39%	8	28	22	14
									Minus 60% Mode Choice	5	17	13	8
Total Estimated Site Generated Person Trips										3	11	9	6
Total Estimated Site Generated Vehicle Trips (1.2 occupancy)										**3**	**9**	**7**	**5**

1. Trip generation rates calculated using ITE Trip Generation Manual, 11th Edition fitted curve equation.

3.4 TRIP DISTRIBUTION

Trip distribution was estimated from the existing turning movement counts. A summary is shown in the figure below:

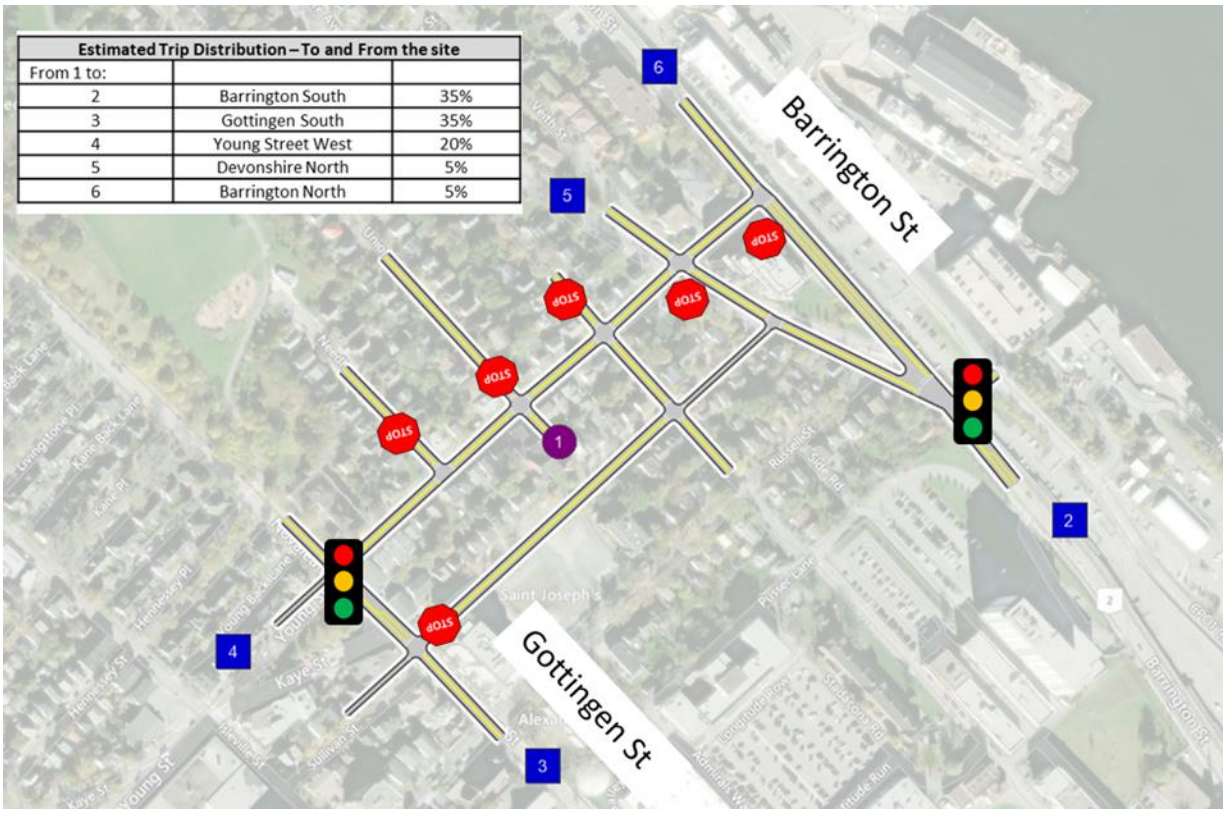


Figure 15- Estimated trip distribution

4.0 FUTURE CONDITIONS

4.1 2029 BACKGROUND TRAFFIC VOLUMES

Background traffic is the traffic added by general annual traffic growth. The development is expected to be completed in 2029, which has been used as the horizon year. A **2.0%** annual growth rate has been applied to existing traffic volumes to determine background traffic volumes. Background volumes for the Young Street intersections are shown below:

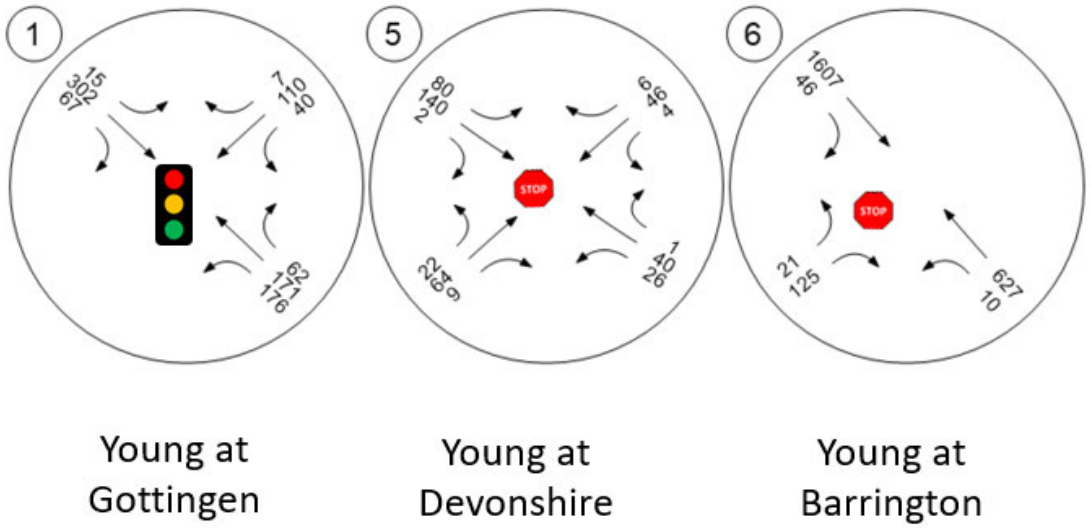


Figure 16- AM Peak Background Volumes

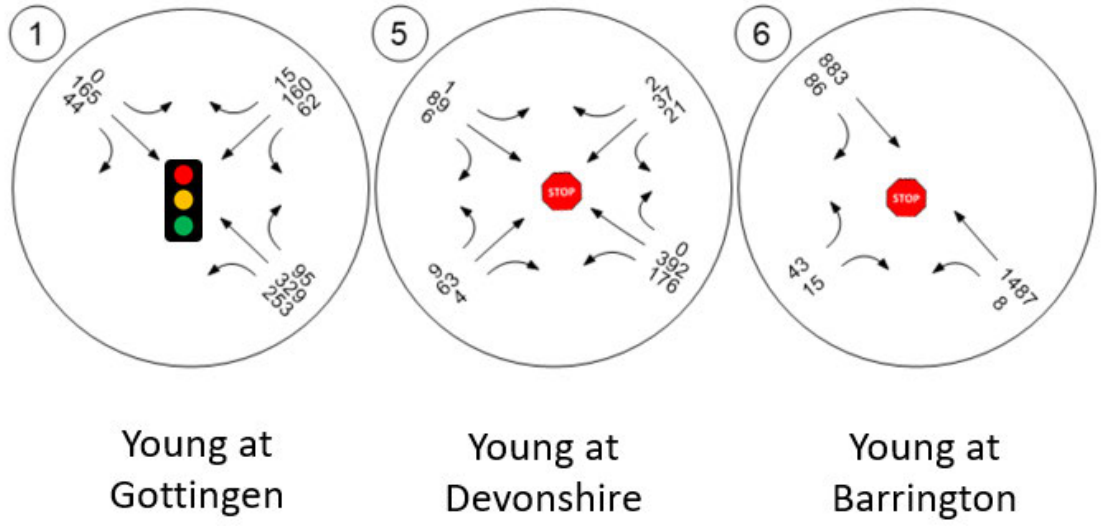


Figure 17- PM Peak Background Volumes

A level of service (LOS) analysis was completed for 2029 background traffic volumes to determine how the Young Street at Gottingen, and the Young Street at Devonshire Avenue intersections would operate without the addition of site generated traffic. Since the Barrington Street intersection currently fails, it was not included in this LOS analysis, a summary of the results is shown in Table 3. All level of service measures for the remaining intersections meet the minimum requirements, and there are no concerns with traffic operations at these locations.

Table 9: Background LOS

AM Peak Hour - 2029 Background Traffic Volumes											
LOS Criteria	Intersection Control	Young Street			Novalea			Gottingen Street			
		NBL	NBT	NBR	SBL	SBT	SBR	WBL	WBT	WBR	Intersection
Vehicle Count		194	188	70	17	333	74	51	124	8	
v/c		0.33	0.25		0.30		0.08	0.69			
Delay (s)		10.24	4.8		5.18		3.92	26.93			9.69
LOS		B	A		A		A	C			3.31
95th% Queue (m)		20.4	14.0		19.9		3.6	34.5			
PM Peak Hour - 2029 Background Traffic Volumes											
LOS Criteria	Intersection Control	Young Street			Novalea			Gottingen Street			
		NBL	NBT	NBR	SBL	SBT	SBR	WBL	WBT	WBR	Intersection
Vehicle Count		279	362	107	0	182	48	75	180	17	
v/c		0.42	0.47		0.17		0.05	0.83			
Delay (s)		10.86	7.79		5.26		4.68	28.41			12.4
LOS		B	A		A		A	C			B
95th% Queue (m)		30.2	37.2		11.0		2.7	53.3			

Table 10: Background LOS

AM Peak Hour - 2029 Background Traffic Volumes														
LOS Criteria	Intersection Control	Devonshire			Devonshire			Young Street			Young Street			
		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Intersection
Vehicle Count		31	44	1	88	154	2	25	72	17	4	42	5	
v/c		0.02			0.06			0.06	0.15	0.02	0.01	0.11	0.01	
Delay (s)		7.56			7.41			15.88	14.87	11.25	15.5	13.71	9.56	6.8
LOS		A	A	A	A	A	A	C	B	B	C	B	A	C
95th% Queue (m)		0.4			1.2			6.8			3.3			
PM Peak Hour - 2029 Background Traffic volumes														
LOS Criteria	Intersection Control	Devonshire			Devonshire			Young Street			Young Street			
		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Intersection
Vehicle Count		196	432	0	1	98	7	11	70	11	23	41	2	
v/c		0.13			0.00			0.07	0.32	0.01	0.17	0.19	0	
Delay (s)		7.67			8.19			30.93	30.93	18.44	41.5	31.71	21.15	7.37
LOS		A	A	A	A	A	A	E	D	C	E	D	C	E
95th% Queue (m)		2.79			0.0			13.5			11.5			

4.2 2029 TOTAL TRAFFIC VOLUMES

The 2029 total traffic volumes are the results of 2029 background volumes plus site generated traffic added by the completed development. Total traffic volumes for the intersections are provided in Figures 13 and 14.

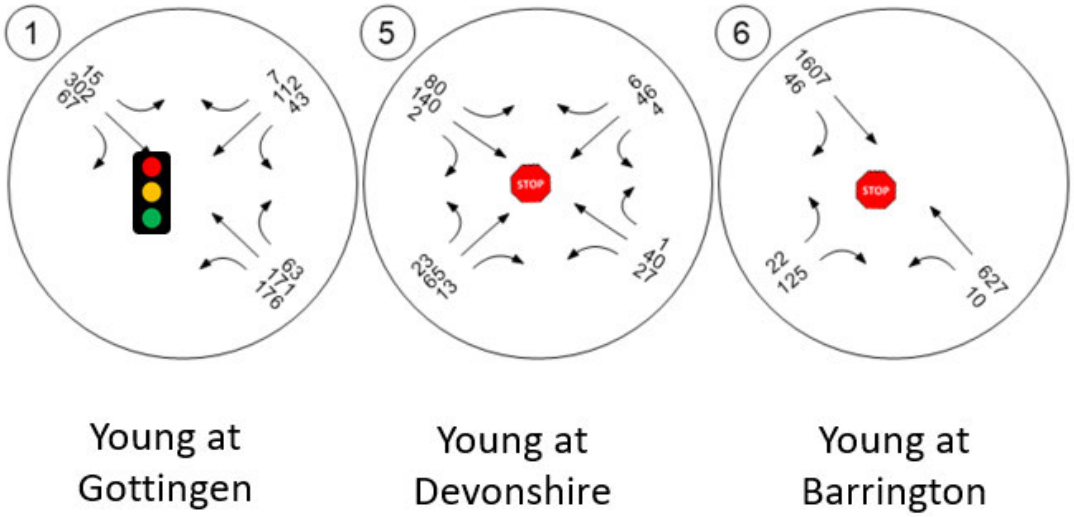


Figure 18: Total AM Peak Hour Volumes

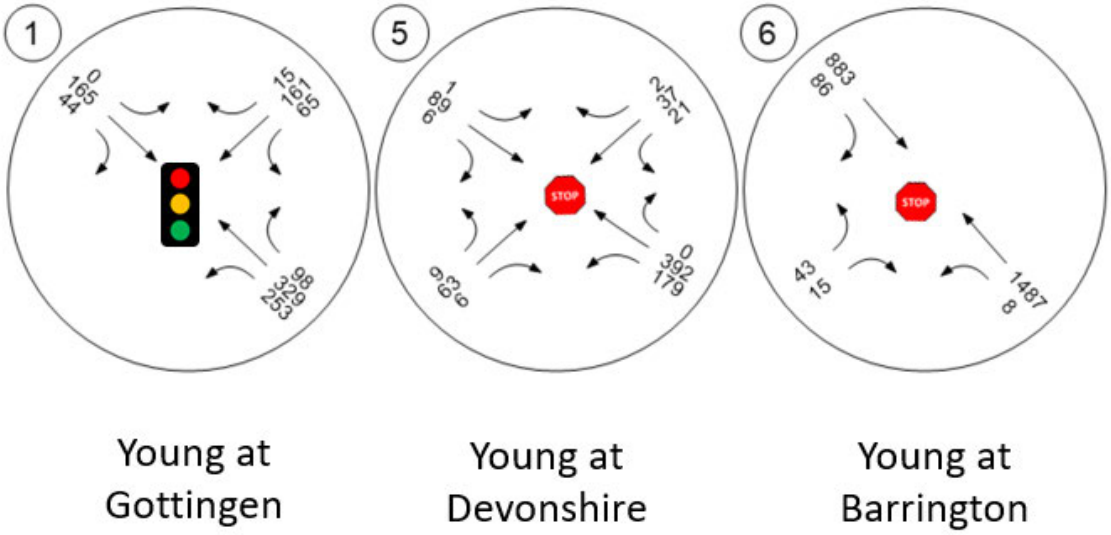


Figure 19: Total PM Peak Hour Volumes

A level of service analysis has been completed for AM & PM peak hours using total traffic volumes. A summary of the VISTRO results is provided in Table 4. There are no operational concerns with the Devonshire and Gottingen Street intersections.

Table 11: 2029 Total Traffic Volumes

AM Peak Hour - 2029 Total Traffic Volumes											
LOS Criteria	Intersection Control	Young Street			Novalea			Gottingen Street			
		NBL	NBT	NBR	SBL	SBT	SBR	WBL	WBT	WBR	Intersection
Vehicle Count		194	188	69	17	333	74	34	94	6	
v/c		0.33	0.24		0.30		0.08	0.67			
Delay (s)		10.21	4.78		5.16		3.91	26.67			9.55
LOS		B	A		A		A	C			A
95th% Queue (m)		20.4	13.9		19.8		3.6	33.3			
PM Peak Hour - Total Traffic Volumes											
LOS Criteria	Intersection Control	Young Street			Novalea			Gottingen Street			
		NBL	NBT	NBR	SBL	SBT	SBR	WBL	WBT	WBR	Intersection
Vehicle Count		279	362	108	0	185	48	72	177	17	
v/c		0.41	0.47		0.11		0.05	0.83			
Delay (s)		10.67	7.66		5.16		4.58	28.54			12.31
LOS		B	A		A		A	C			B
95th% Queue (m)		29.8	36.7		10.8		2.7	52.2			

Table 12: 2029 Total Traffic Volumes

AM Peak Hour - Total Traffic														
LOS Criteria	Intersection Control	Devonshire			Devonshire			Young Street			Young Street			
		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Intersection
Vehicle Count		30	36	1	88	154	2	25	72	14	4	51	7	
v/c			0.02			0.06		0.06	0.15	0.02	0.01	0.11	0.01	
Delay (s)			7.56			7.41		15.82	14.81	11.22	15.38	13.68	9.55	6.76
LOS		A	A	A	A	A	A	C	B	B	C	B	A	C
95th% Queue (m)														
PM Peak Hour - Total Traffic														
LOS Criteria	Intersection Control	Devonshire			Devonshire			Young Street			Young Street			
		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Intersection
Vehicle Count		197	432	0	1	98	7	10	69	7	23	41	1	
v/c			0.13			0.00		0.06	0.31	0.01	0.17	0.19	0	
Delay (s)			7.67			8.19		36.2	30.79	18.24	41.23	31.763	21.1	7.24
LOS		A	A	A	A	A	A	EBL	D	C	E	D	C	E
95th% Queue (m)		2.8	2.8		0.0			12.8			11.5			

4.3 SIGNAL WARRANTS

For the total 2029 traffic volumes, a signal warrant analysis was completed out for the Young Street at Devonshire Avenue intersection. The off-peak hour volumes (11am -1 pm) were assumed to be 80% of the PM peak hour volumes. Pedestrian volumes were assumed to be 40 passengers per hour for all six analysis periods. Using the above assumptions, the warrant score was 64 which indicates that signals are not warranted at this location. A copy of the signal warrant has been included in the Appendix B.

5.0 SUMMARY

The proposed development replaces an existing United Church with up to 78 dwelling units. A total of 13 to 26 underground parking spaces will be provided. There is one driveway off Young Street There are two major transit corridors within a 200 metre walk of the site.

The stop-controlled intersection at the Young Street at Barrington currently fails during the AM and PM peak hour periods with long queues and delays for the Young Street approach. The proposed development is estimated to generate 14 vehicle trips and 15 vehicle trips during the AM and PM peak hours respectively.

The stop-controlled intersection at the Young Street at Devonshire Avenue intersection operates within the accepted operating criteria for the Existing, Background, and Total traffic volume time periods.

The traffic signals at Young Street at Gottingen intersection operates within the accepted operating criteria for the Existing, Background, and Total traffic volume time periods. Signals are not warranted at the Young Street at Devonshire Avenue intersection.

6.0 CONCLUSIONS

The existing street network can accommodate the traffic generated by the development without upgrades. The location of this development, within walking distance of two transit corridors, promotes the choice of alternative modes of traffic.

APPENDIX A – VISTRO REPORTS

Vistro File: C:\...\United Memorial Base Plan.vistro
Report File: C:\...\AM Background LOS.pdf

Scenario 3 AM Background
5/13/2024

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Young at Gottingen	Signalized	HCM 7th Edition	WB Thru	0.325	9.4	A
5	Young at Devonshire	Two-way stop	HCM 7th Edition	EB Left	0.057	15.7	C
6	Young at Barrington	Two-way stop	HCM 7th Edition	EB Left	0.776	726.1	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Young at Gottingen

Control Type:	Signalized	Delay (sec / veh):	9.4
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.325

Intersection Setup

Name	Novalea			Gottingen			Young Street			Young Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66
No. of Lanes in Entry Pocket	1	0	0	0	0	1	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			48.28			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Novalea			Gottingen			Young Street			Young Street		
Base Volume Input [veh/h]	150	146	53	13	258	57	0	0	0	34	94	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.1700	1.1700	1.1700	1.1700	1.1700	1.1700	1.0000	1.0000	1.0000	1.1700	1.1700	1.1700
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	176	171	62	15	302	67	0	0	0	40	110	7
Peak Hour Factor	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	1.0000	1.0000	1.0000	0.9080	0.9080	0.9080
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	48	47	17	4	83	18	0	0	0	11	30	2
Total Analysis Volume [veh/h]	194	188	68	17	333	74	0	0	0	44	121	8
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	60
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	10	0	0	10	0	0	10	0	0	10	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	43	0	0	43	0	0	66	0	0	17	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	6	0	0	6	0	0	6	0	0	6	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No						No	
Maximum Recall		No			No						No	
Pedestrian Recall		No			No						No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R		C
C, Cycle Length [s]	60	60	60	60		60
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00		6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00		0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00		4.00
g_i, Effective Green Time [s]	40	40	40	40		10
g / C, Green / Cycle	0.66	0.66	0.66	0.66		0.16
(v / s)_i Volume / Saturation Flow Rate	0.22	0.16	0.21	0.05		0.10
s, saturation flow rate [veh/h]	880	1608	1663	1431		1649
c, Capacity [veh/h]	583	1056	1155	940		264
d1, Uniform Delay [s]	8.64	4.21	4.46	3.73		23.68
k, delay calibration	0.50	0.50	0.50	0.50		0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00
d2, Incremental Delay [s]	1.53	0.54	0.68	0.16		2.76
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00

Lane Group Results

X, volume / capacity	0.33	0.24	0.30	0.08		0.66
d, Delay for Lane Group [s/veh]	10.17	4.75	5.14	3.89		26.44
Lane Group LOS	B	A	A	A		C
Critical Lane Group	Yes	No	No	No		Yes
50th-Percentile Queue Length [veh/ln]	1.48	1.00	1.44	0.26		2.35
50th-Percentile Queue Length [m/ln]	11.27	7.64	10.98	1.97		17.89
95th-Percentile Queue Length [veh/ln]	2.66	1.81	2.59	0.47		4.23
95th-Percentile Queue Length [m/ln]	20.29	13.76	19.76	3.55		32.20

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	10.17	4.75	4.75	5.14	5.14	3.89	0.00	0.00	0.00	26.44	26.44	26.44
Movement LOS	B	A	A	A	A	A				C	C	C
d_A, Approach Delay [s/veh]	7.09			4.92			0.00			26.44		
Approach LOS	A			A			A			C		
d_I, Intersection Delay [s/veh]	9.41											
Intersection LOS	A											
Intersection V/C	0.325											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	21.70	21.70	21.70	21.70
l_p,int, Pedestrian LOS Score for Intersectio	2.369	2.257	2.290	1.929
Crosswalk LOS	B	B	B	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1266	1266	0	366
d_b, Bicycle Delay [s]	4.05	4.05	30.02	20.03
l_b,int, Bicycle LOS Score for Intersection	2.302	2.259	4.132	1.845
Bicycle LOS	B	B	D	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: Young at Devonshire

Control Type:	Two-way stop	Delay (sec / veh):	15.7
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.057

Intersection Setup

Name	Devonshire			Devonshire			Young Street			Young Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Devonshire			Devonshire			Young Street			Young Street		
Base Volume Input [veh/h]	24	36	1	73	127	2	20	58	8	4	42	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	40	1	80	140	2	22	64	9	4	46	6
Peak Hour Factor	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	11	0	22	39	1	6	18	2	1	13	2
Total Analysis Volume [veh/h]	29	44	1	88	154	2	24	70	10	4	51	7
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			Yes	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.06	0.00	0.00	0.06	0.15	0.01	0.01	0.11	0.01
d_M, Delay for Movement [s/veh]	7.56	0.00	0.00	7.41	0.00	0.00	15.66	14.67	11.10	15.20	13.64	9.54
Movement LOS	A	A	A	A	A	A	C	B	B	C	B	A
95th-Percentile Queue Length [veh/ln]	0.05	0.05	0.05	0.15	0.15	0.15	0.81	0.81	0.81	0.42	0.42	0.42
95th-Percentile Queue Length [m/ln]	0.38	0.38	0.38	1.18	1.18	1.18	6.21	6.21	6.21	3.24	3.24	3.24
d_A, Approach Delay [s/veh]	2.96			2.67			14.55			13.28		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	6.63											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 6: Young at Barrington

Control Type:	Two-way stop	Delay (sec / veh):	726.1
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.776

Intersection Setup

Name	Barrington Street		Barrington Street		Young Street	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left2	Thru	Thru	Right	Left	Right
Lane Width [m]	3.66	3.66	3.66	3.66	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00		50.00		50.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Barrington Street		Barrington Street		Young Street	
Base Volume Input [veh/h]	9	570	1461	42	19	114
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	627	1607	46	21	125
Peak Hour Factor	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	173	442	13	6	34
Total Analysis Volume [veh/h]	11	691	1770	51	23	138
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.01	0.02	0.00	0.78	1.38
d_M, Delay for Movement [s/veh]	15.73	0.00	0.00	0.00	726.09	640.75
Movement LOS	C	A	A	A	F	F
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.00	0.00	14.86	14.86
95th-Percentile Queue Length [m/ln]	0.14	0.14	0.00	0.00	113.27	113.27
d_A, Approach Delay [s/veh]	0.25		0.00		652.94	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	39.23					
Intersection LOS	F					

Vistro File: C:\...\United Memorial Base Plan.vistro
Report File: C:\...\AM Peak Existing LOS.pdf

Scenario 1 Exist AM Peak
5/13/2024

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Young at Gottingen	Signalized	HCM 7th Edition	WB Thru	0.287	9.0	A
5	Young at Devonshire	Two-way stop	HCM 7th Edition	EB Left	0.048	14.4	B
6	Young at Barrington	Two-way stop	HCM 7th Edition	EB Left	0.533	447.7	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Young at Gottingen

Control Type:	Signalized	Delay (sec / veh):	9.0
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.287

Intersection Setup

Name	Novalea			Gottingen			Young Street			Young Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66
No. of Lanes in Entry Pocket	1	0	0	0	0	1	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			48.28			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Novalea			Gottingen			Young Street			Young Street		
Base Volume Input [veh/h]	150	146	53	13	258	57	0	0	0	34	94	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0610	1.0610	1.0610	1.0610	1.0610	1.0610	1.0000	1.0000	1.0000	1.0610	1.0610	1.0610
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	159	155	56	14	274	60	0	0	0	36	100	6
Peak Hour Factor	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	1.0000	1.0000	1.0000	0.9080	0.9080	0.9080
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	44	43	15	4	75	17	0	0	0	10	28	2
Total Analysis Volume [veh/h]	175	171	62	15	302	66	0	0	0	40	110	7
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	60
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	10	0	0	10	0	0	10	0	0	10	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	43	0	0	43	0	0	66	0	0	17	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	6	0	0	6	0	0	6	0	0	6	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No						No	
Maximum Recall		No			No						No	
Pedestrian Recall		No			No						No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R		C
C, Cycle Length [s]	60	60	60	60		60
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00		6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00		0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00		4.00
g_i, Effective Green Time [s]	40	40	40	40		9
g / C, Green / Cycle	0.66	0.66	0.66	0.66		0.16
(v / s)_i Volume / Saturation Flow Rate	0.19	0.14	0.19	0.05		0.10
s, saturation flow rate [veh/h]	912	1607	1665	1431		1649
c, Capacity [veh/h]	613	1060	1161	944		259
d1, Uniform Delay [s]	7.85	4.07	4.29	3.65		23.58
k, delay calibration	0.50	0.50	0.50	0.50		0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00
d2, Incremental Delay [s]	1.17	0.48	0.58	0.14		2.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00

Lane Group Results

X, volume / capacity	0.29	0.22	0.27	0.07		0.61
d, Delay for Lane Group [s/veh]	9.02	4.55	4.87	3.79		25.86
Lane Group LOS	A	A	A	A		C
Critical Lane Group	Yes	No	No	No		Yes
50th-Percentile Queue Length [veh/ln]	1.22	0.88	1.25	0.23		2.10
50th-Percentile Queue Length [m/ln]	9.29	6.73	9.53	1.72		15.99
95th-Percentile Queue Length [veh/ln]	2.19	1.59	2.25	0.41		3.78
95th-Percentile Queue Length [m/ln]	16.72	12.11	17.16	3.10		28.77

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	9.02	4.55	4.55	4.87	4.87	3.79	0.00	0.00	0.00	25.86	25.86	25.86
Movement LOS	A	A	A	A	A	A				C	C	C
d_A, Approach Delay [s/veh]	6.46			4.68			0.00			25.86		
Approach LOS	A			A			A			C		
d_I, Intersection Delay [s/veh]	8.96											
Intersection LOS	A											
Intersection V/C	0.287											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	21.70	21.70	21.70	21.70
l_p,int, Pedestrian LOS Score for Intersectio	2.327	2.225	2.204	1.907
Crosswalk LOS	B	B	B	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1266	1266	0	366
d_b, Bicycle Delay [s]	4.05	4.05	30.02	20.03
l_b,int, Bicycle LOS Score for Intersection	2.233	2.192	4.132	1.819
Bicycle LOS	B	B	D	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: Young at Devonshire

Control Type:	Two-way stop	Delay (sec / veh):	14.4
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.048

Intersection Setup

Name	Devonshire			Devonshire			Young Street			Young Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Devonshire			Devonshire			Young Street			Young Street		
Base Volume Input [veh/h]	24	36	1	73	127	2	20	58	8	4	42	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	24	36	1	73	127	2	20	58	8	4	42	5
Peak Hour Factor	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	10	0	20	35	1	6	16	2	1	12	1
Total Analysis Volume [veh/h]	26	40	1	80	140	2	22	64	9	4	46	6
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			Yes	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.05	0.00	0.00	0.05	0.13	0.01	0.01	0.09	0.01
d_M, Delay for Movement [s/veh]	7.53	0.00	0.00	7.39	0.00	0.00	14.44	13.74	10.56	14.13	12.98	9.31
Movement LOS	A	A	A	A	A	A	B	B	B	B	B	A
95th-Percentile Queue Length [veh/ln]	0.04	0.04	0.04	0.14	0.14	0.14	0.67	0.67	0.67	0.36	0.36	0.36
95th-Percentile Queue Length [m/ln]	0.34	0.34	0.34	1.07	1.07	1.07	5.13	5.13	5.13	2.71	2.71	2.71
d_A, Approach Delay [s/veh]	2.92			2.66			13.60			12.67		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	6.34											
Intersection LOS	B											

Intersection Level Of Service Report
Intersection 6: Young at Barrington

Control Type:	Two-way stop	Delay (sec / veh):	447.7
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.533

Intersection Setup

Name	Barrington Street		Barrington Street		Young Street	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left2	Thru	Thru	Right	Left	Right
Lane Width [m]	3.66	3.66	3.66	3.66	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00		50.00		50.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Barrington Street		Barrington Street		Young Street	
Base Volume Input [veh/h]	9	570	1461	42	19	114
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0200	1.0200	1.0200	1.0200	1.0200	1.0200
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	581	1490	43	19	116
Peak Hour Factor	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	160	410	12	5	32
Total Analysis Volume [veh/h]	10	640	1641	47	21	128
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.01	0.02	0.00	0.53	1.07
d_M, Delay for Movement [s/veh]	14.53	0.00	0.00	0.00	447.65	386.30
Movement LOS	B	A	A	A	F	F
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.00	0.00	11.76	11.76
95th-Percentile Queue Length [m/ln]	0.13	0.13	0.00	0.00	89.62	89.62
d_A, Approach Delay [s/veh]	0.22		0.00		394.95	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	23.72					
Intersection LOS	F					

Vistro File: C:\...\United Memorial Base Plan.vistro
Report File: C:\...\AM Total LOS.pdf

Scenario 5 Total AM
5/13/2024

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Young at Gottingen	Signalized	HCM 7th Edition	WB Thru	0.328	9.5	A
5	Young at Devonshire	Two-way stop	HCM 7th Edition	EB Left	0.060	15.8	C
6	Young at Barrington	Two-way stop	HCM 7th Edition	EB Left	0.809	741.3	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Young at Gottingen

Control Type:	Signalized	Delay (sec / veh):	9.5
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.328

Intersection Setup

Name	Novalea			Gottingen			Young Street			Young Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66
No. of Lanes in Entry Pocket	1	0	0	0	0	1	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			48.28			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Novalea			Gottingen			Young Street			Young Street		
Base Volume Input [veh/h]	150	146	53	13	258	57	0	0	0	34	94	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.1700	1.1700	1.1700	1.1700	1.1700	1.1700	1.0000	1.0000	1.0000	1.1700	1.1700	1.1700
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	1	0	0	0	0	1	0	3	2	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	176	171	63	15	302	67	0	1	0	43	112	7
Peak Hour Factor	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	1.0000	1.0000	1.0000	0.9080	0.9080	0.9080
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	48	47	17	4	83	18	0	0	0	12	31	2
Total Analysis Volume [veh/h]	194	188	69	17	333	74	0	1	0	47	123	8
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	60
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	10	0	0	10	0	0	10	0	0	10	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	43	0	0	43	0	0	66	0	0	17	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	6	0	0	6	0	0	6	0	0	6	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No						No	
Maximum Recall		No			No						No	
Pedestrian Recall		No			No						No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R		C
C, Cycle Length [s]	60	60	60	60		60
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00		6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00		0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00		4.00
g_i, Effective Green Time [s]	39	39	39	39		10
g / C, Green / Cycle	0.66	0.66	0.66	0.66		0.16
(v / s)_i Volume / Saturation Flow Rate	0.22	0.16	0.21	0.05		0.11
s, saturation flow rate [veh/h]	880	1607	1663	1431		1648
c, Capacity [veh/h]	582	1054	1154	939		265
d1, Uniform Delay [s]	8.68	4.23	4.48	3.74		23.72
k, delay calibration	0.50	0.50	0.50	0.50		0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00
d2, Incremental Delay [s]	1.54	0.55	0.68	0.16		2.95
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00

Lane Group Results

X, volume / capacity	0.33	0.24	0.30	0.08		0.67
d, Delay for Lane Group [s/veh]	10.21	4.78	5.16	3.91		26.67
Lane Group LOS	B	A	A	A		C
Critical Lane Group	Yes	No	No	No		Yes
50th-Percentile Queue Length [veh/ln]	1.48	1.01	1.45	0.26		2.43
50th-Percentile Queue Length [m/ln]	11.30	7.71	11.02	1.98		18.51
95th-Percentile Queue Length [veh/ln]	2.67	1.82	2.60	0.47		4.37
95th-Percentile Queue Length [m/ln]	20.35	13.88	19.84	3.56		33.32

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	10.21	4.78	4.78	5.16	5.16	3.91	0.00	0.00	0.00	26.67	26.67	26.67
Movement LOS	B	A	A	A	A	A				C	C	C
d_A, Approach Delay [s/veh]	7.11			4.94			0.00			26.67		
Approach LOS	A			A			A			C		
d_I, Intersection Delay [s/veh]	9.55											
Intersection LOS	A											
Intersection V/C	0.328											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	21.70	21.70	21.70	21.70
l_p,int, Pedestrian LOS Score for Intersectio	2.371	2.257	2.294	1.934
Crosswalk LOS	B	B	B	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1266	1266	0	366
d_b, Bicycle Delay [s]	4.05	4.05	30.02	20.03
l_b,int, Bicycle LOS Score for Intersection	2.304	2.259	4.132	1.853
Bicycle LOS	B	B	D	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: Young at Devonshire

Control Type:	Two-way stop	Delay (sec / veh):	15.8
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.060

Intersection Setup

Name	Devonshire			Devonshire			Young Street			Young Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Devonshire			Devonshire			Young Street			Young Street		
Base Volume Input [veh/h]	24	36	1	73	127	2	20	58	8	4	42	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	0	0	0	0	0	1	1	4	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	40	1	80	140	2	23	65	13	4	46	6
Peak Hour Factor	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	11	0	22	39	1	6	18	4	1	13	2
Total Analysis Volume [veh/h]	30	44	1	88	154	2	25	72	14	4	51	7
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			Yes	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.06	0.00	0.00	0.06	0.15	0.02	0.01	0.11	0.01
d_M, Delay for Movement [s/veh]	7.56	0.00	0.00	7.41	0.00	0.00	15.82	14.81	11.22	15.38	13.68	9.55
Movement LOS	A	A	A	A	A	A	C	B	B	C	B	A
95th-Percentile Queue Length [veh/ln]	0.05	0.05	0.05	0.15	0.15	0.15	0.87	0.87	0.87	0.43	0.43	0.43
95th-Percentile Queue Length [m/ln]	0.39	0.39	0.39	1.18	1.18	1.18	6.64	6.64	6.64	3.25	3.25	3.25
d_A, Approach Delay [s/veh]	3.02			2.67			14.58			13.32		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	6.76											
Intersection LOS	C											

Intersection Level Of Service Report
Intersection 6: Young at Barrington

Control Type:	Two-way stop	Delay (sec / veh):	741.3
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.809

Intersection Setup

Name	Barrington Street		Barrington Street		Young Street	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left2	Thru	Thru	Right	Left	Right
Lane Width [m]	3.66	3.66	3.66	3.66	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00		50.00		50.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Barrington Street		Barrington Street		Young Street	
Base Volume Input [veh/h]	9	570	1461	42	19	114
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	627	1607	46	22	125
Peak Hour Factor	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	173	442	13	6	34
Total Analysis Volume [veh/h]	11	691	1770	51	24	138
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.01	0.02	0.00	0.81	1.38
d_M, Delay for Movement [s/veh]	15.73	0.00	0.00	0.00	741.25	655.92
Movement LOS	C	A	A	A	F	F
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.00	0.00	15.05	15.05
95th-Percentile Queue Length [m/ln]	0.14	0.14	0.00	0.00	114.69	114.69
d_A, Approach Delay [s/veh]	0.25		0.00		668.56	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	40.40					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 1: Young Street at Gottingen

Control Type:	Signalized	Delay (sec / veh):	12.2
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.447

Intersection Setup

Name	Novalea			Gottingen			Young Street			Young Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66
No. of Lanes in Entry Pocket	1	0	0	0	0	1	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			48.28			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Novalea			Gottingen			Young Street			Young Street		
Base Volume Input [veh/h]	216	281	81	0	141	38	0	0	0	53	137	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.1700	1.1700	1.1700	1.1700	1.1700	1.1700	1.0000	1.0000	1.0000	1.1700	1.1700	1.1700
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	253	329	95	0	165	44	0	0	0	62	160	15
Peak Hour Factor	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	1.0000	1.0000	1.0000	0.9080	0.9080	0.9080
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	70	91	26	0	45	12	0	0	0	17	44	4
Total Analysis Volume [veh/h]	279	362	105	0	182	48	0	0	0	68	176	17
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	60
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	10	0	0	10	0	0	10	0	0	10	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	30	0	0	30	0	0	30	0	0	30	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	6	0	0	6	0	0	6	0	0	6	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No						No	
Maximum Recall		No			No						No	
Pedestrian Recall		No			No						No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R		C
C, Cycle Length [s]	60	60	60	60		60
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00		6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00		0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00		4.00
g_i, Effective Green Time [s]	38	38	38	38		12
g / C, Green / Cycle	0.62	0.62	0.62	0.62		0.19
(v / s)_i Volume / Saturation Flow Rate	0.27	0.29	0.11	0.03		0.16
s, saturation flow rate [veh/h]	1035	1619	1683	1431		1643
c, Capacity [veh/h]	679	1010	1110	893		317
d1, Uniform Delay [s]	8.68	5.97	4.76	4.39		23.27
k, delay calibration	0.50	0.50	0.50	0.50		0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00
d2, Incremental Delay [s]	1.83	1.52	0.32	0.11		5.37
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00

Lane Group Results

X, volume / capacity	0.41	0.46	0.16	0.05		0.82
d, Delay for Lane Group [s/veh]	10.52	7.49	5.08	4.51		28.64
Lane Group LOS	B	A	A	A		C
Critical Lane Group	No	Yes	No	No		Yes
50th-Percentile Queue Length [veh/ln]	2.15	2.61	0.78	0.19		3.74
50th-Percentile Queue Length [m/ln]	16.38	19.90	5.92	1.48		28.53
95th-Percentile Queue Length [veh/ln]	3.87	4.70	1.40	0.35		6.74
95th-Percentile Queue Length [m/ln]	29.48	35.82	10.66	2.66		51.35

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	10.52	7.49	7.49	5.08	5.08	4.51	0.00	0.00	0.00	28.64	28.64	28.64
Movement LOS	B	A	A	A	A	A				C	C	C
d_A, Approach Delay [s/veh]	8.62			4.96			0.00			28.64		
Approach LOS	A			A			A			C		
d_I, Intersection Delay [s/veh]	12.16											
Intersection LOS	B											
Intersection V/C	0.447											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	21.70	21.70	21.70	21.70
l_p,int, Pedestrian LOS Score for Intersectio	2.460	2.251	2.590	1.993
Crosswalk LOS	B	B	B	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	833	833	0	799
d_b, Bicycle Delay [s]	10.23	10.23	30.02	10.82
l_b,int, Bicycle LOS Score for Intersection	2.791	1.939	4.132	1.990
Bicycle LOS	C	A	D	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: Young at Devonshire

Control Type:	Two-way stop	Delay (sec / veh):	40.3
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.162

Intersection Setup

Name	Devonshire			Devonshire			Young Street			Young Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Devonshire			Devonshire			Young Street			Young Street		
Base Volume Input [veh/h]	160	356	0	1	81	5	8	57	4	19	34	2
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	176	392	0	1	89	6	9	63	4	21	37	2
Peak Hour Factor	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	48	108	0	0	25	2	2	17	1	6	10	1
Total Analysis Volume [veh/h]	194	432	0	1	98	7	10	69	4	23	41	2
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	Yes
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.13	0.00	0.00	0.00	0.00	0.00	0.06	0.31	0.00	0.16	0.18	0.00
d_M, Delay for Movement [s/veh]	7.66	0.00	0.00	8.19	0.00	0.00	35.75	30.46	18.09	40.28	31.15	20.70
Movement LOS	A	A	A	A	A	A	E	D	C	E	D	C
95th-Percentile Queue Length [veh/ln]	0.36	0.36	0.36	0.00	0.00	0.00	1.63	1.63	1.63	1.47	1.47	1.47
95th-Percentile Queue Length [m/ln]	2.76	2.76	2.76	0.01	0.01	0.01	12.44	12.44	12.44	11.22	11.22	11.22
d_A, Approach Delay [s/veh]	2.37			0.08			30.50			34.01		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	7.12											
Intersection LOS	E											

Intersection Level Of Service Report
Intersection 6: Young at Barrington

Control Type:	Two-way stop	Delay (sec / veh):	954.1
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	2.270

Intersection Setup

Name	Barrington Street				Young Street	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.66	3.66	3.66	3.66	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00		50.00		50.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Barrington Street				Young Street	
Base Volume Input [veh/h]	7	1352	803	78	39	14
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	1487	883	86	43	15
Peak Hour Factor	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	409	243	24	12	4
Total Analysis Volume [veh/h]	9	1638	972	95	47	17
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.02	0.01	0.00	2.27	0.06
d_M, Delay for Movement [s/veh]	10.52	0.00	0.00	0.00	954.06	792.72
Movement LOS	B	A	A	A	F	F
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.00	0.00	7.69	7.69
95th-Percentile Queue Length [m/ln]	0.11	0.11	0.00	0.00	58.58	58.58
d_A, Approach Delay [s/veh]	0.06		0.00		911.20	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	21.03					
Intersection LOS	F					

Vistro File: C:\...\United Memorial Base Plan.vistro
Report File: C:\...\PM Background LOS.pdf

Scenario 4 PM Background
5/13/2024

Turning Movement Volume: Summary

ID	Intersection Name	Northbound			Southbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	Young Street at Gottingen	253	329	95	0	165	44	62	160	15	1123

ID	Intersection Name	Northbound			Southbound			Eastbound			Westbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
5	Young at Devonshire	176	392	0	1	89	6	9	63	4	21	37	2	800

ID	Intersection Name	Northbound		Southbound		Eastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
6	Young at Barrington	8	1487	883	86	43	15	2522

Vistro File: C:\...\United Memorial Base Plan.vistro
Report File: C:\...\PM Peak Existing LOS.pdf

Scenario 2 Exist PM Peak
5/13/2024

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Young Street at Gottingen	Signalized	HCM 7th Edition	WB Thru	0.406	11.5	B
5	New Intersection	Two-way stop	HCM 7th Edition	WB Left	0.117	30.6	D
6	Young at Barrington	Two-way stop	HCM 7th Edition	EB Left	1.312	436.4	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Young Street at Gottingen

Control Type:	Signalized	Delay (sec / veh):	11.5
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.406

Intersection Setup

Name	Novalea			Gottingen			Young Street			Young Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66
No. of Lanes in Entry Pocket	1	0	0	0	0	1	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			48.28			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Novalea			Gottingen			Young Street			Young Street		
Base Volume Input [veh/h]	216	281	81	0	141	38	0	0	0	53	137	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0600	1.0600	1.0600	1.0600	1.0600	1.0600	1.0000	1.0000	1.0000	1.0600	1.0600	1.0600
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	229	298	86	0	149	40	0	0	0	56	145	14
Peak Hour Factor	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	1.0000	1.0000	1.0000	0.9080	0.9080	0.9080
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	63	82	24	0	41	11	0	0	0	15	40	4
Total Analysis Volume [veh/h]	252	328	95	0	164	44	0	0	0	62	160	15
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	60
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	10	0	0	10	0	0	10	0	0	10	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	30	0	0	30	0	0	30	0	0	30	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	6	0	0	6	0	0	6	0	0	6	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No						No	
Maximum Recall		No			No						No	
Pedestrian Recall		No			No						No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R		C
C, Cycle Length [s]	60	60	60	60		60
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00		6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00		0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00		4.00
g_i, Effective Green Time [s]	38	38	38	38		11
g / C, Green / Cycle	0.64	0.64	0.64	0.64		0.18
(v / s)_i Volume / Saturation Flow Rate	0.24	0.26	0.10	0.03		0.14
s, saturation flow rate [veh/h]	1056	1619	1683	1431		1643
c, Capacity [veh/h]	713	1035	1136	915		292
d1, Uniform Delay [s]	7.57	5.29	4.33	4.03		23.75
k, delay calibration	0.50	0.50	0.50	0.50		0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00
d2, Incremental Delay [s]	1.37	1.20	0.27	0.10		5.43
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00

Lane Group Results

X, volume / capacity	0.35	0.41	0.14	0.05		0.81
d, Delay for Lane Group [s/veh]	8.94	6.48	4.60	4.13		29.18
Lane Group LOS	A	A	A	A		C
Critical Lane Group	No	Yes	No	No		Yes
50th-Percentile Queue Length [veh/ln]	1.72	2.10	0.64	0.16		3.43
50th-Percentile Queue Length [m/ln]	13.07	16.02	4.89	1.25		26.14
95th-Percentile Queue Length [veh/ln]	3.09	3.78	1.16	0.30		6.17
95th-Percentile Queue Length [m/ln]	23.53	28.83	8.81	2.26		47.05

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	8.94	6.48	6.48	4.60	4.60	4.13	0.00	0.00	0.00	29.18	29.18	29.18
Movement LOS	A	A	A	A	A	A				C	C	C
d_A, Approach Delay [s/veh]	7.40			4.50			0.00			29.18		
Approach LOS	A			A			A			C		
d_I, Intersection Delay [s/veh]	11.47											
Intersection LOS	B											
Intersection V/C	0.406											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	21.70	21.70	21.70	21.70
l_p,int, Pedestrian LOS Score for Intersectio	2.409	2.219	2.478	1.965
Crosswalk LOS	B	B	B	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	833	833	0	799
d_b, Bicycle Delay [s]	10.23	10.23	30.02	10.82
l_b,int, Bicycle LOS Score for Intersection	2.673	1.903	4.132	1.951
Bicycle LOS	B	A	D	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: New Intersection

Control Type:	Two-way stop	Delay (sec / veh):	30.6
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.117

Intersection Setup

Name	Devonshire			Devonshire			Young Street			Young Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Devonshire			Devonshire			Young Street			Young Street		
Base Volume Input [veh/h]	160	356	0	1	81	5	8	57	4	19	34	2
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	160	356	0	1	81	5	8	57	4	19	34	2
Peak Hour Factor	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	44	98	0	0	22	1	2	16	1	5	9	1
Total Analysis Volume [veh/h]	176	392	0	1	89	6	9	63	4	21	37	2
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.12	0.00	0.00	0.00	0.00	0.00	0.04	0.25	0.00	0.12	0.14	0.00
d_M, Delay for Movement [s/veh]	7.62	0.00	0.00	8.09	0.00	0.00	28.21	24.69	14.40	30.65	24.69	16.10
Movement LOS	A	A	A	A	A	A	D	C	B	D	C	C
95th-Percentile Queue Length [veh/ln]	0.32	0.32	0.32	0.00	0.00	0.00	1.18	1.18	1.18	1.03	1.03	1.03
95th-Percentile Queue Length [m/ln]	2.47	2.47	2.47	0.01	0.01	0.01	9.02	9.02	9.02	7.84	7.84	7.84
d_A, Approach Delay [s/veh]	2.36			0.08			24.57			26.49		
Approach LOS	A			A			C			D		
d_I, Intersection Delay [s/veh]	6.01											
Intersection LOS	D											

Intersection Level Of Service Report
Intersection 6: Young at Barrington

Control Type:	Two-way stop	Delay (sec / veh):	436.4
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.312

Intersection Setup

Name	Barrington Street				Young Street	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.66	3.66	3.66	3.66	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00		50.00		50.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Barrington Street				Young Street	
Base Volume Input [veh/h]	7	1352	803	78	39	14
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	1352	803	78	39	14
Peak Hour Factor	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	372	221	21	11	4
Total Analysis Volume [veh/h]	8	1489	884	86	43	15
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.00	1.31	0.05
d_M, Delay for Movement [s/veh]	10.08	0.00	0.00	0.00	436.39	337.60
Movement LOS	B	A	A	A	F	F
95th-Percentile Queue Length [veh/ln]	0.01	0.01	0.00	0.00	5.72	5.72
95th-Percentile Queue Length [m/ln]	0.10	0.10	0.00	0.00	43.56	43.56
d_A, Approach Delay [s/veh]	0.05		0.00		410.84	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	9.47					
Intersection LOS	F					

Vistro File: C:\...\United Memorial Base Plan.vistro
Report File: C:\...\PM Total LOS.pdf

Scenario 6 Total PM
5/13/2024

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Young Street at Gottingen	Signalized	HCM 7th Edition	WB Thru	0.453	12.3	B
5	Young at Devonshire	Two-way stop	HCM 7th Edition	WB Left	0.166	41.2	E
6	Young at Barrington	Two-way stop	HCM 7th Edition	EB Left	2.270	954.1	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Young Street at Gottingen

Control Type:	Signalized	Delay (sec / veh):	12.3
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.453

Intersection Setup

Name	Novalea			Gottingen			Young Street			Young Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66
No. of Lanes in Entry Pocket	1	0	0	0	0	1	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			48.28			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No						No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Novalea			Gottingen			Young Street			Young Street		
Base Volume Input [veh/h]	216	281	81	0	141	38	0	0	0	53	137	13
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.1700	1.1700	1.1700	1.1700	1.1700	1.1700	1.0000	1.0000	1.0000	1.1700	1.1700	1.1700
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	3	0	0	0	0	2	0	3	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	253	329	98	0	165	44	0	2	0	65	161	15
Peak Hour Factor	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	1.0000	1.0000	1.0000	0.9080	0.9080	0.9080
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	70	91	27	0	45	12	0	1	0	18	44	4
Total Analysis Volume [veh/h]	279	362	108	0	182	48	0	2	0	72	177	17
Presence of On-Street Parking	No		No	No		No				No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	60
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	10	0	0	10	0	0	10	0	0	10	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
All red [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Split [s]	0	30	0	0	30	0	0	30	0	0	30	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	6	0	0	6	0	0	6	0	0	6	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No						No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	4.0	0.0	0.0	4.0	0.0
Minimum Recall		No			No						No	
Maximum Recall		No			No						No	
Pedestrian Recall		No			No						No	
Detector Location [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	R		C
C, Cycle Length [s]	60	60	60	60		60
L, Total Lost Time per Cycle [s]	5.00	5.00	5.00	5.00		6.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00		0.00
l2, Clearance Lost Time [s]	3.00	3.00	3.00	3.00		4.00
g_i, Effective Green Time [s]	37	37	37	37		12
g / C, Green / Cycle	0.62	0.62	0.62	0.62		0.20
(v / s)_i Volume / Saturation Flow Rate	0.27	0.29	0.11	0.03		0.16
s, saturation flow rate [veh/h]	1035	1617	1683	1431		1642
c, Capacity [veh/h]	676	1004	1105	888		322
d1, Uniform Delay [s]	8.81	6.09	4.84	4.47		23.17
k, delay calibration	0.50	0.50	0.50	0.50		0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00		1.00
d2, Incremental Delay [s]	1.86	1.57	0.32	0.12		5.37
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00		0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00		1.00
PF, progression factor	1.00	1.00	1.00	1.00		1.00

Lane Group Results

X, volume / capacity	0.41	0.47	0.16	0.05		0.83
d, Delay for Lane Group [s/veh]	10.67	7.66	5.16	4.58		28.54
Lane Group LOS	B	A	A	A		C
Critical Lane Group	No	Yes	No	No		Yes
50th-Percentile Queue Length [veh/ln]	2.17	2.68	0.79	0.20		3.81
50th-Percentile Queue Length [m/ln]	16.57	20.40	6.01	1.50		29.02
95th-Percentile Queue Length [veh/ln]	3.91	4.82	1.42	0.35		6.86
95th-Percentile Queue Length [m/ln]	29.82	36.72	10.82	2.70		52.24

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	10.67	7.66	7.66	5.16	5.16	4.58	0.00	0.00	0.00	28.54	28.54	28.54
Movement LOS	B	A	A	A	A	A				C	C	C
d_A, Approach Delay [s/veh]	8.78			5.04			0.00			28.54		
Approach LOS	A			A			A			C		
d_I, Intersection Delay [s/veh]	12.31											
Intersection LOS	B											
Intersection V/C	0.453											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [m²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	21.70	21.70	21.70	21.70
l_p,int, Pedestrian LOS Score for Intersectio	2.464	2.251	2.592	1.999
Crosswalk LOS	B	B	B	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	833	833	0	799
d_b, Bicycle Delay [s]	10.23	10.23	30.02	10.82
l_b,int, Bicycle LOS Score for Intersection	2.795	1.939	4.132	1.999
Bicycle LOS	C	A	D	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 5: Young at Devonshire

Control Type:	Two-way stop	Delay (sec / veh):	41.2
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.166

Intersection Setup

Name	Devonshire			Devonshire			Young Street			Young Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [m]	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00			50.00			50.00			50.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Devonshire			Devonshire			Young Street			Young Street		
Base Volume Input [veh/h]	160	356	0	1	81	5	8	57	4	19	34	2
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	0	0	0	0	0	0	0	2	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	179	392	0	1	89	6	9	63	6	21	37	2
Peak Hour Factor	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	49	108	0	0	25	2	2	17	2	6	10	1
Total Analysis Volume [veh/h]	197	432	0	1	98	7	10	69	7	23	41	2
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	Yes
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.13	0.00	0.00	0.00	0.00	0.00	0.06	0.31	0.01	0.17	0.19	0.00
d_M, Delay for Movement [s/veh]	7.67	0.00	0.00	8.19	0.00	0.00	36.20	30.79	18.24	41.23	31.73	21.10
Movement LOS	A	A	A	A	A	A	E	D	C	E	D	C
95th-Percentile Queue Length [veh/ln]	0.37	0.37	0.37	0.00	0.00	0.00	1.68	1.68	1.68	1.50	1.50	1.50
95th-Percentile Queue Length [m/ln]	2.80	2.80	2.80	0.01	0.01	0.01	12.81	12.81	12.81	11.46	11.46	11.46
d_A, Approach Delay [s/veh]	2.40			0.08			30.40			34.72		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	7.24											
Intersection LOS	E											

Intersection Level Of Service Report
Intersection 6: Young at Barrington

Control Type:	Two-way stop	Delay (sec / veh):	954.1
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	2.270

Intersection Setup

Name	Barrington Street				Young Street	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [m]	3.66	3.66	3.66	3.66	3.66	3.66
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [m]	30.48	30.48	30.48	30.48	30.48	30.48
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [m]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [km/h]	50.00		50.00		50.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Barrington Street				Young Street	
Base Volume Input [veh/h]	7	1352	803	78	39	14
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.1000	1.1000	1.1000	1.1000	1.1000	1.1000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	1487	883	86	43	15
Peak Hour Factor	0.9080	0.9080	0.9080	0.9080	0.9080	0.9080
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	409	243	24	12	4
Total Analysis Volume [veh/h]	9	1638	972	95	47	17
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.02	0.01	0.00	2.27	0.06
d_M, Delay for Movement [s/veh]	10.52	0.00	0.00	0.00	954.06	792.72
Movement LOS	B	A	A	A	F	F
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.00	0.00	7.69	7.69
95th-Percentile Queue Length [m/ln]	0.11	0.11	0.00	0.00	58.58	58.58
d_A, Approach Delay [s/veh]	0.06		0.00		911.20	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	21.03					
Intersection LOS	F					

APPENDIX B- SIGNAL WARRANT

HRM - Traffic Signal & Pedestrian Signal Head Warrant Analysis

Main Street (name)	Devonshire
Side Street (name)	Young Street
Quadrant / Int #	
	CHECK SHEET

for Warrant Calculation Results, please hit 'Page Down'

Direction (EW or NS)	NS
Direction (EW or NS)	EW
Comments	

Road Authority:	HRM
City:	Halifax
Analysis Date:	2024 May 13, Mon
Count Date:	2024 May 13, Mon
Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	RT Channelization (y/n)	UpStream Signal (m)	# of Thru Lanes	LT Phase Type	RTOR Allowed (y/n)	Actuated Thru Phase
Devonshire	NB				1			n	150	1			
Devonshire	SB				1			n	1,000	1			
Young Street	WB				1			n	1,000	1			
Beaconsfield	EB				1			n	400	1			

Are the Young Street WB right turns significantly impeded by through movements? (y/n)	n
Are the Beaconsfield EB right turns significantly impeded by through movements? (y/n)	n
Are the Devonshire NB right turns significantly impeded by through movements? (y/n)	n
Are the Devonshire SB right turns significantly impeded by through movements? (y/n)	n

Saturation Flow Rates (if not default) (vphpl)		Default Saturation Flow Rates (vphpl)
Left Turn		1,650
Through		1,800
Right Turn		1,500

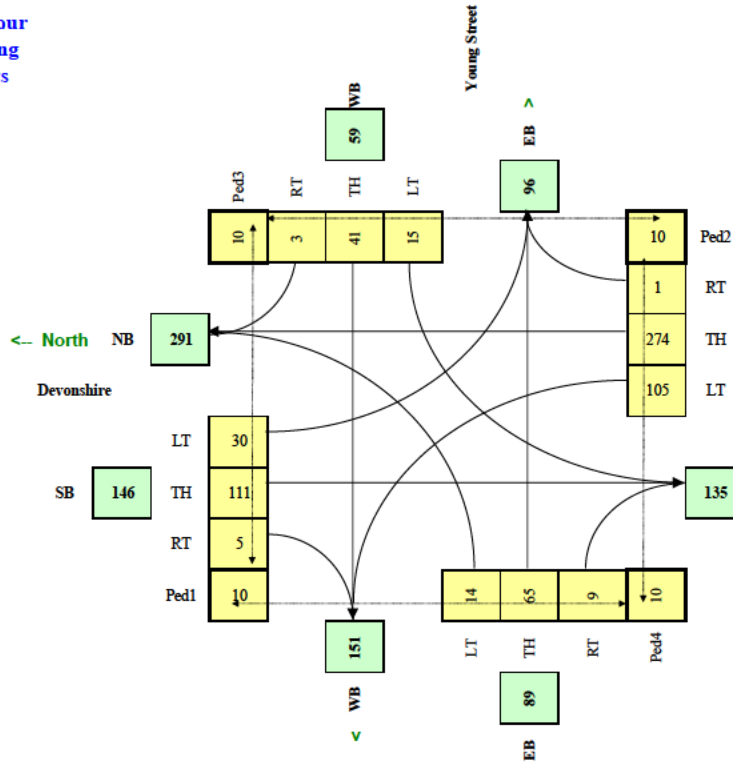
Demographics		
Elem. School/Mobility Challenged	(y/n)	y
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	480,000
Central Business District	(y/n)	y

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Devonshire	NS	50	2.0%	n	3.0
Young Street	EW		2.0%	n	0.0

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
press 'Set Peak Hours' Button to set the peak hour periods	30	44	1	88	154	2	4	51	5	25	72	14	10	10	10	10
	30	44	1	88	154	2	4	51	5	25	72	14	10	10	10	10
	160	345	1	1	80	6	18	32	1	8	55	6	10	10	10	10
	16	345	1	1	80	6	18	32	1	8	55	6	10	10	10	10
	197	432	0	1	98	7	23	41	2	10	69	7	10	10	10	10
	197	432	0	1	98	7	23	41	2	10	69	7	10	10	10	10
Total (6-hour peak)	630	1,642	4	180	664	30	90	248	16	86	392	54	60	60	60	60
Average (6-hour peak)	105	274	1	30	111	5	15	41	3	14	65	9	10	10	10	10
													Actual Pedestrian Crossing Distance (m)		10.0	10.0	12.0	12.0

Average 6-hour Peak Turning Movements



$W_{SIG} = [C_{bt}(X_{v\text{-}v}) / K_1 + (F (X_{v\text{-}p}) L) / K_2] \times C_i$

W =	64	53	11
		Veh	*Ped*

NOT Warranted

RESET SHEET

$W_{PED} = [F ((Xped_m)d_m/K_2) + (Xped_s)d_s/K_3)]$

W = 11

Warranted - Complex Intersection