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Memorandum

To: Mike Giampa, P.Eng.
Date: October 8, 2025
From: Juan Lavin P.Eng / Jake Berube P.Eng, RSP1
Project: 477176-01000
Copy: Barrett Wagar RPP, MCIP, M.PL
Subject: **W.O. Stinson & Son Ltd – 5545 Albion Road**
Transportation Impact Assessment Addendum #2

This memorandum has been prepared to satisfy Site Plan Control transportation requirements for the proposed development located at 5545 Albion Road. A draft TIA Strategy Report (Oct. 2019) previously addressed the site requirements for the 5505-5545 Albion Road properties, which had proposed a development including a gas station, a commercial truck cardlock gas bar, a double window drive-through restaurant, a truck vehicle service bay and secure truck parking. Since that submission, a revised Addendum #1 for 5505-5545 Albion Road was provided in August 2023, which removed the drive-through restaurant, commercial cardlock gas bar and public gas station, while the service building and the fleet parking lot for trucks were to be kept as part of the proposed development.

Addendum #2 has been prepared in support of a new Site Plan Control application for the 5545 Albion Road site. This development proposal includes a gas bar with drive-through restaurant and a small commercial cardlock gas bar. The site plan no longer includes the 5505 Albion Road property, which had previously proposed secure truck parking and the vehicle service bays. A copy of the TIA Addendum #1 report has been provided in **Appendix A.**

1.0 PROPOSED SITE PLAN

The proposed development is located at the municipal address of 5545 Albion Rd, on the northeast quadrant of the Albion Rd and Mitch Owens Rd intersection as shown in **Figure 1**. The proposed site statistics, and a recounting of previous development statistics, have been summarized in **Table 1.** The table indicates that the 5545 Albion Road development has less potential transportation demands when compared to the October 2019 TIA Strategy Report.

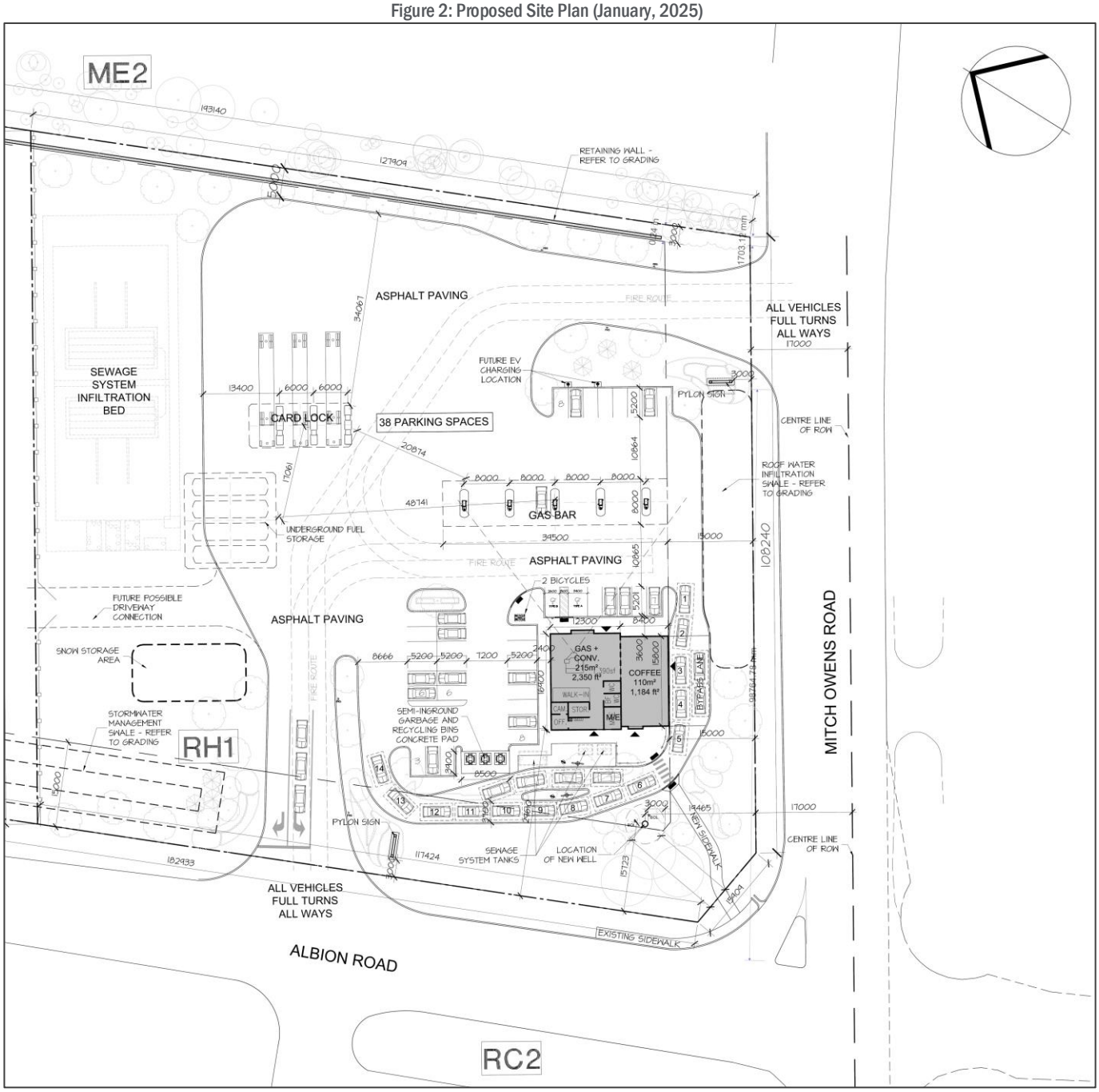
Figure 2 illustrates the most up-to-date site plan with a higher quality image in **Appendix B**.

Figure 1: Site Context

Table 1: Comparison and Proposed Site Statistics

Site Plan Date	Gas Bar + Convenience	Commercial Cardlock	Restaurant with Drive-Through	Service Bay	Truck Storage
October 2019 (Original TIA)	5 pumps, 1,950 ft²	4 pumps	2,700 ft²	6 bays	44 tandem, 24 trailers
August 2023 (TIA Addendum #1)	-	-	-	5 bays	66 tandem, 14 trailers
November 2024 (TIA Addendum #2)	**5 pumps, 2,350 ft²**	**3 pumps**	**1,250 ft²**	-	-

Figure 2: Proposed Site Plan (January, 2025)



2.0 EXISTING AND FUTURE BACKGROUND CONDITIONS

2.1 Existing Conditions

A refreshed traffic count for the intersection of Albion/Mitch Owens (dated October 8, 2024) was obtained by Parsons (provided in **Appendix C**), of which the morning and afternoon peak hour traffic volumes are illustrated in **Figure 3**. It is worthwhile to note that these traffic volumes are notably higher than 2019, likely due to the ongoing Bank Street Renewal (Riverside Drive to Ledbury Avenue) project, which has Bank Street to one-lane south of Leitrim Road. Albion Road is an

alternative route to Bank Street resulting in higher existing turning movements than anticipated. This analysis is considered conservative.

Intersection capacity analysis was conducted for the morning and afternoon peak hour existing conditions using Synchro 11 traffic analysis software according to the City of Ottawa TIA Guidelines. The Albion/Mitch Owens intersection was assessed in terms of the volume-to-capacity (v/c) ratio and the corresponding Level of Service (LOS) for the critical movement, as well as an overall intersection v/c ratio and corresponding LOS. Detailed Synchro reports are provided in **Appendix D**.

Figure 3: Albion/Mitch Owens 2024 Existing Peak Hour Traffic Counts

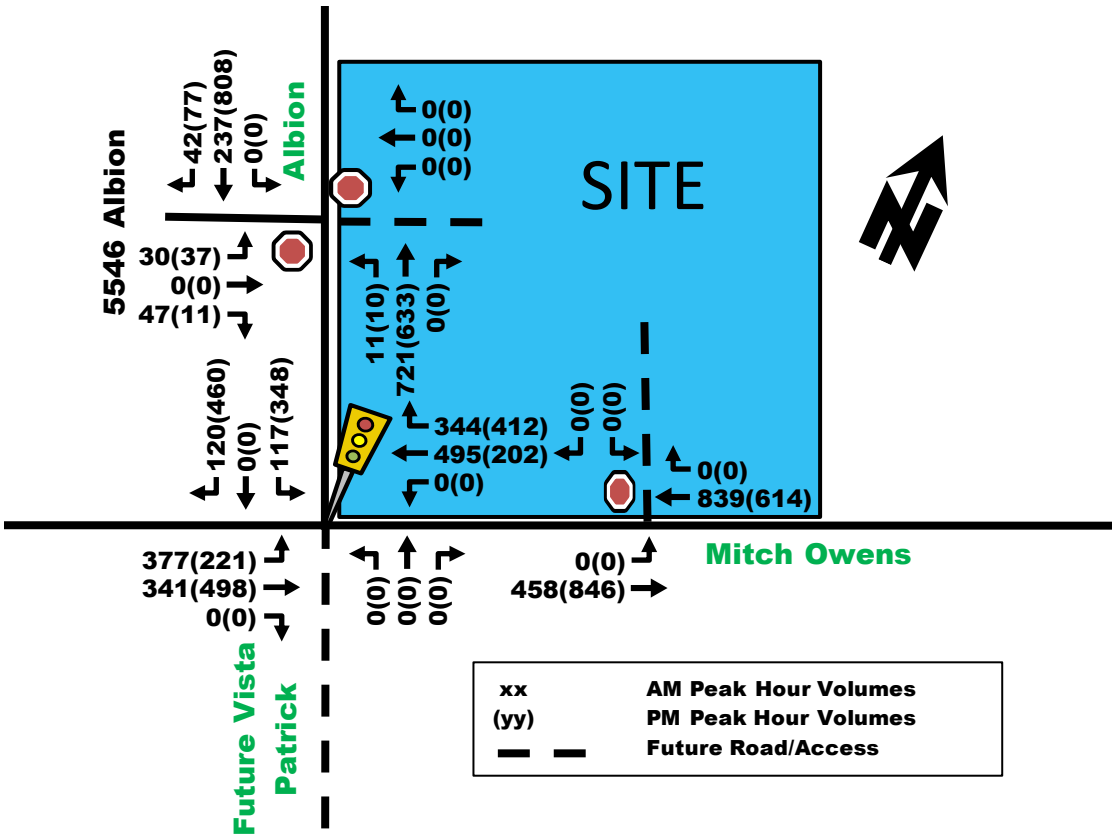


Table 2: Existing Intersection Operations

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LOS	max. v/c or avg. delay (s)	Movement	Delay (s)	LOS	v/c
Albion/Mitch Owens	F(F)	1.03(1.02)	WBT(EBL)	38.3(26.8)	E(C)	0.92(0.78)
Albion Access	C(F)	16(57)	EB(EB)	1(2)	A(A)	-
Note: Analysis assumes a PHF of 0.90 for existing conditions and a saturation flow rate of 1800 veh/h/lane.						

A review of the existing conditions intersection operations indicates that the intersection 'as a whole' operate with acceptable levels of service, with the Albion/Mitch Owens approaching capacity during the AM peak hour. The critical movements however most operate above the city's acceptable levels of service, with v/c slightly over 1.0 and delays slightly over 50s which are the thresholds between acceptable LoS 'E' and above capacity LoS 'F'.

Notable 95th percentile queue lengths have been identified for the EB-LT (120m) and the WB-Th (160m) in the AM peak hour, and EB-Th in the PM peak hour (120m). The queues do not block the EB-LT (265m storage) or the WB-RT (165m storage).

2.2 Future Background Conditions

Based on previous submissions, but no longer found on development applications search by the City of Ottawa, there are three adjacent developments which may be built in the future and would convert the intersection of Albion/Mitch Owens into a four-legged intersection. For the purpose of this addendum, those future development volumes based on their original TIAs will be layered on to existing volumes, with their proposed locations shown on **Figure 4** and their forecasted trip generation shown in **Figure 5**. The development at 5546 Albion Rd does not propose new site accesses.

In addition, a 0.5% annual growth rate will be added to all arterial-to-arterial road movements to account for future growth, although as noted earlier, the base counts are notably higher than 2019, likely to do with the Bank St ongoing construction project and detoured vehicles. A future buildout year of 2025 is assumed and a buildout plus 5 years, 2030, will be analyzed, with forecasted traffic volumes illustrated in **Figure 6**.

Figure 4: Location of Other Possible Area Developments

Figure 5: Other Area Development Trip Generation and Intersection Configuration Assumptions

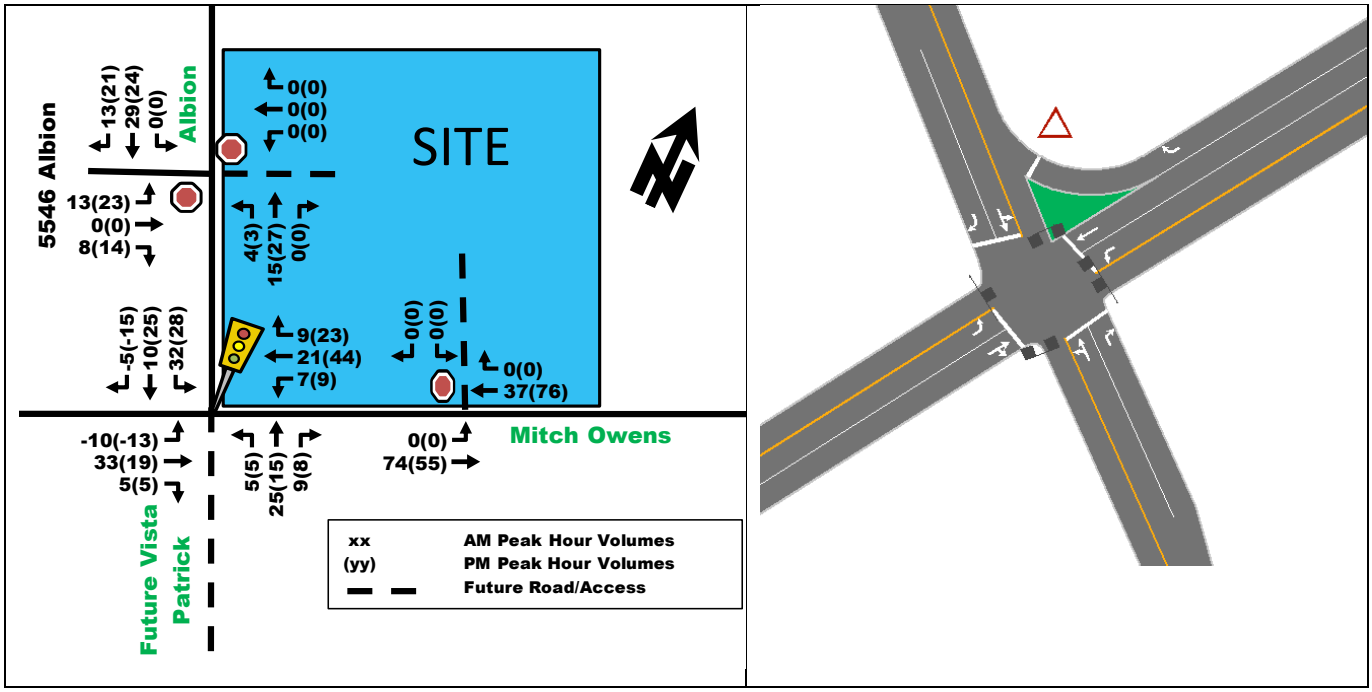
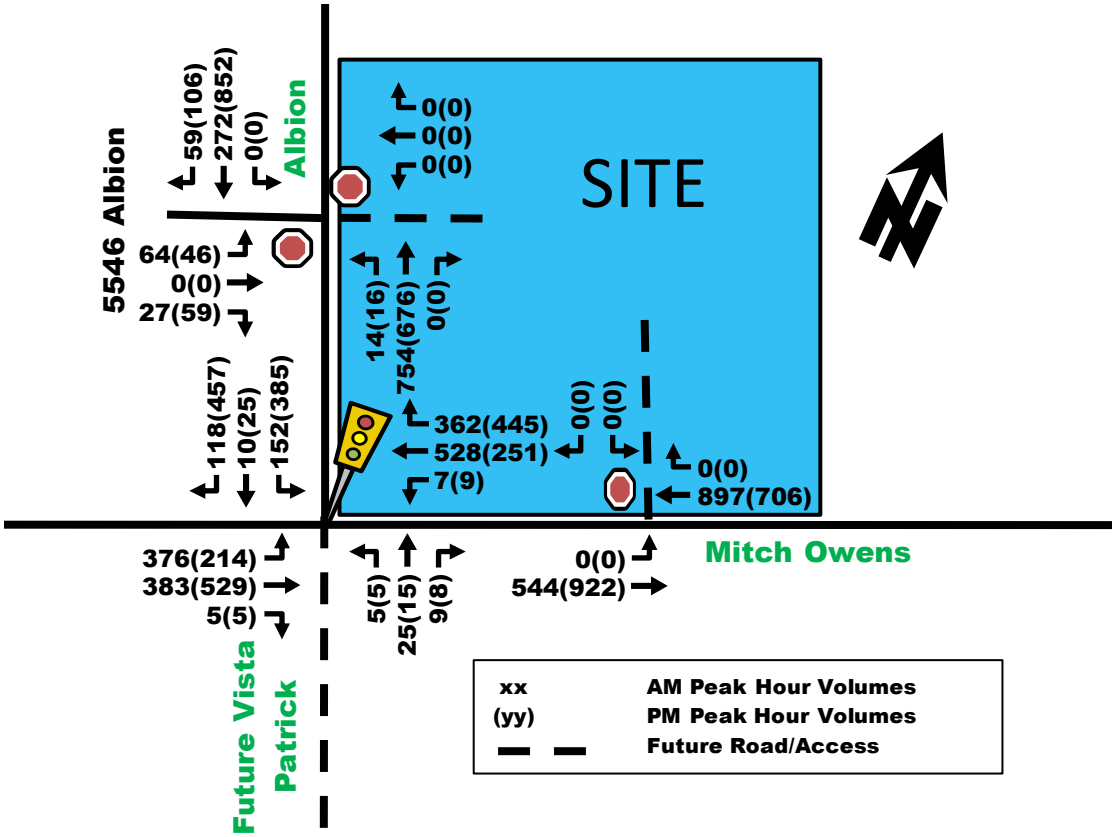


Figure 6: Future Background Volumes – 2030 – AM(PM) Peak Hours



The volumes illustrated in **Figure 6** were then layered onto the Synchro model, with intersection performance summarized in **Table 3** with detailed outputs in **Appendix E.**

Table 3: Future Background Intersection Performance – 2030

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LOS	max. v/c or avg. delay (s)	Movement	Delay (s)	LOS	v/c
Albion/Mitch Owens*	E(F)	0.94(1.07)	EBL(SBT)	35.7(35.6)	D(D)	0.90(0.88)
Albion Access	D(F)	28(57)	EB(EB)	2(4)	A(A)	-
Note: Analysis assumes a PHF of 1.00 for future conditions and a saturation flow rate of 1800 veh/h/lane. *Albion/Mitch Owens modelled as a four-legged intersection based on future intersection design; intersection phase splits optimized in Synchro.*						

Overall, the intersections were found to continue to operate similarly to existing conditions, with some critical movements operating above capacity. While an annual growth rate of 0.5% and the new southbound approach would generally worsen intersection performance, they tended to stay consistent as some vehicles were expected to bypass the intersection as they use the proposed adjacent site at MacEwens and then return to the network past the intersection. The forecasted delays at the Albion Access may be reduced as drivers choose to change their route to avoid the more complex left-turn out of the site, however as a whole, the intersection operates very well. The v/c rates can be lowered to within acceptable performance for Albion/Mitch Owens by extending the cycle length from the existing 75s to a longer cycle such as 90s; however, it would result in longer queues and delays for some movements. Queues were forecasted to be slightly lower than existing, dropping to within the 100-150m range which is considered acceptable given the low number of accesses and rural cross-section.

3.0 UPDATED SITE TRIP GENERATION

The proposed development will consist of a 1,250 ft^2 coffee shop (116 m^2) with a drive-through and a 2,350 ft^2 (218 m^2) convenience store accompanied by a gas station with 5 pumps. The gas station has 2 fuelling positions at each pump, for a combined total of 10 fueling positions.

The commercial cardlock land use is not anticipated to produce a notable amount of peak hour trips as it is not a regional truck stop along a busy highway such as the 400-series highways. The few trips that the commercial cardlock could produce are assumed to be captured within the convenience store/gas station land use.

The appropriate trip generation rates for each land-use were obtained from the ITE Trip Generation Manual 11th Edition. The peak hour vehicle trip rates are summarized in **Table 4** below.

Table 4: Proposed Development Vehicle Trip Rates (ITE Trip Generation Manual 11th Edition)

Land Use	Size	Data Source	Trip Rates	
			AM Peak	PM Peak
Convenience Store/Gas Station – VFP (9-15)	2,350 ft^2	ITE 945	T = 56.52(x);	T = 54.52(x);
Coffee/Donut Shop with Drive-Through Window	1,250 ft^2	ITE 937	T = 85.88(x);	T = 38.99(x);
Note: T = Average Vehicle Trip Ends; x = 1000 ft^2				

The total number of person trips per hour generated by the proposed development are calculated by multiplying the vehicle trip rates from **Table 4** by 1.28 factor, as per the ITE Trip Generation Manual to account for typical North American auto occupancy, transit use and non-motorized mode. The resulting person trips per peak hour shown in **Table 5** below.

Table 5: Peak Hour Person Trip Generation

Land Use	GFA	AM Peak Person Trips	PM Peak Person Trips
Convenience Store/Gas Station – VFP (16-24)	2,350 ft^2	170	164
Coffee/Donut Shop with Drive-Through Window	1,250 ft^2	137	62
Total	**3,600 ft^2**	**307**	**226**

The proposed development is anticipated to generate a total of approximately 305 and 225 person trips during the morning and afternoon peak hours, respectively. **Table 6** provides the mode share percentages obtained from the 2020 TRANS Manual for the "Gloucester South" district and anticipated proposed mode share breakdown for this development. The table summarizes the mode share rationale for each mode.

Table 6: Existing and Proposed Weekday Peak Hour Mode Share Breakdown

Travel Mode	TRANS 2020 Mode Share		Proposed Mode Share	Rationale
	AM	PM		
Auto Driver	74%	62%	85%	Expected due to nature of development and site context
Auto Passenger	14%	27%	15%	Approximately 1.2 ratio passenger to driver
Transit	1%	1%	0%	Nature of development expected to generate negligible transit trips
Cycling	0%	0%	0%	Limited cycling facilities adjacent to the site and site context
Walking	11%	11%	0%	Low density near site and little pedestrian trips forecasted
Total Person Trips	**100%**	**100%**	**100%**	–

The total peak hour person trips in **Table 5** are then divided into different travel modes using the proposed mode shares shown above in **Table 6**. The resultant trips per mode share for the new convenience store/gas station, the new coffee/donut shop with drive-through and the combined site trip generation have been summarized in **Table 7**, **Table** 8 and **Table 9** respectively.

Table 7: New Convenience Store/Gas Station Peak Hour Trips Generated – AM / PM Peak Hours

Travel Mode	Mode Share	AM Peak (Person Trips/hr)			PM Peak (Person Trips/hr)		
		In	Out	Total	In	Out	Total
Auto Driver	85%	73	73	146	70	70	140
Auto Passenger	15%	12	12	24	12	12	24
Transit and non-motorized	0%	0	0	0	0	0	0
Total Person Trips	100%	85	85	170	82	82	164

Table 8: New Coffee/Donut Shop with Drive-Through Peak Hour Trips Generated – AM / PM Peak Hours

Travel Mode	Mode Share	AM Peak (Person Trips/hr)			PM Peak (Person Trips/hr)		
		In	Out	Total	In	Out	Total
Auto Driver	85%	59	58	117	27	27	54
Auto Passenger	15%	10	10	20	4	4	8
Transit and non-motorized	0%	0	0	0	0	0	0
Total Person Trips	100%	69	68	137	31	31	62

Table 9: Site Generated Trips Pre-Reductions – AM / PM Peak Hours

Travel Mode	Mode Share	AM Peak (Person Trips/hr)			PM Peak (Person Trips/hr)		
		In	Out	Total	In	Out	Total
Auto Driver	85%	132	131	263	97	97	194
Auto Passenger	15%	22	22	44	16	16	32
Transit and non-motorized	0%	0	0	0	0	0	0
Total Person Trips	100%	154	153	307	113	113	226

3.1 Internal Trip Reduction

Internal trips are multi-purpose trips, where more than one land-use within the same development is captured by the same person trip. For example, someone whose primary trip purpose was to get gas may also decide to get a coffee afterwards or may decide to grab a snack. Based on the published Internal Capture Rates from Section 6.5 of the ITE Trip

Generation Handbook, an internal trip reduction of 30% was determined to be suitable for the morning and afternoon peak hours.

The trip reductions were applied to the auto-driver trips for their respective peak hours shown in **Table 9** with the results displayed below in **Table 10**.

3.2 Pass-By Trip Reduction

Pass-by trips are intermediate 'destinations' along the original route between the primary origin and destination, such as a stop at a gas station between someone's workplace and home. Based on the nature and location of the development with the site frontage along two notable commuter arterial roads, pass-by trips are expected to account for a significant portion of the site generated trips.

The average pass-by rates as per the ITE 2021 Pass-By Tables for the ITE 938 (Coffee/Donut Shop with Drive-Through and No Indoor Seating) and ITE 945 (Convenience Store/Gas Station) land uses, are 90% and 75% respectively. The rates were then averaged and slightly reduced for a final proposed rate of 80%, to account for the expected indoor seating that is assumed to be provided within the proposed restaurant/coffee shop. Note that the pass-by trips were calculated after the internal reduction factor was applied.

Table 10: Total Site Generated Trips

Travel Mode	Mode Share	AM Peak Hour (Trips/hr)			PM Peak Hour (Trips/hr)		
		In	Out	Total	In	Out	Total
Auto Driver	85%	92	92	184	68	68	136
-Pre-Internal Reduction		*132*	*131*	*263*	*97*	*97*	*194*
-Vehicles Reduced -30%		*-40*	*-39*	*-79*	*-29*	*-29*	*-58*
Auto Passenger	15%	22	22	44	16	16	32
Transit and non-motorized	0%	0	0	0	0	0	0
Total Person Trips	100%	114	114	228	84	84	168
Less Pass-by 80%		-74	-74	-148	-55	-55	-109
Total 'New' Site Auto Trips		**18**	**18**	**36**	**13**	**13**	**27**

As shown above in **Table 10**, the proposed development is anticipated to generate 230 to 170 total person trips, 185 to 135 vehicle trips, and 0 transit/active trips during the AM and PM peak hours respectively. Once pass-by trips have been considered, the development is anticipated to generate approximately 35 and 25 'new' auto driver trips during the morning and afternoon peak hours, respectively.

Figure 7 illustrates the projected trip generation by the site for the AM and PM peak hours. These volumes were then layered on to the future background volumes from **Figure 6** to produce the total forecasted volumes by 2030 (full buildout plus 5 years) including the site generated traffic as shown in **Figure 8**. Note that negative numbers reflect changes in commuter routes based on pass-by trips. For example, it has been identified that a large portion of vehicles today travel westbound on Mitch Owens Rd and then turn north on to Albion Rd. With the addition of this new gas station and coffee shop, it is assumed that westbound pass-by trips would likely enter the site at the Mitch Owens Rd access, then exit northbound at the Albion Rd access, completely bypassing the Albion/Mitch Owens intersection and therefore removing some vehicular trips at that intersection.

Figure 7: Projected Site Vehicle Trip Generation – AM (PM) Peak Hours

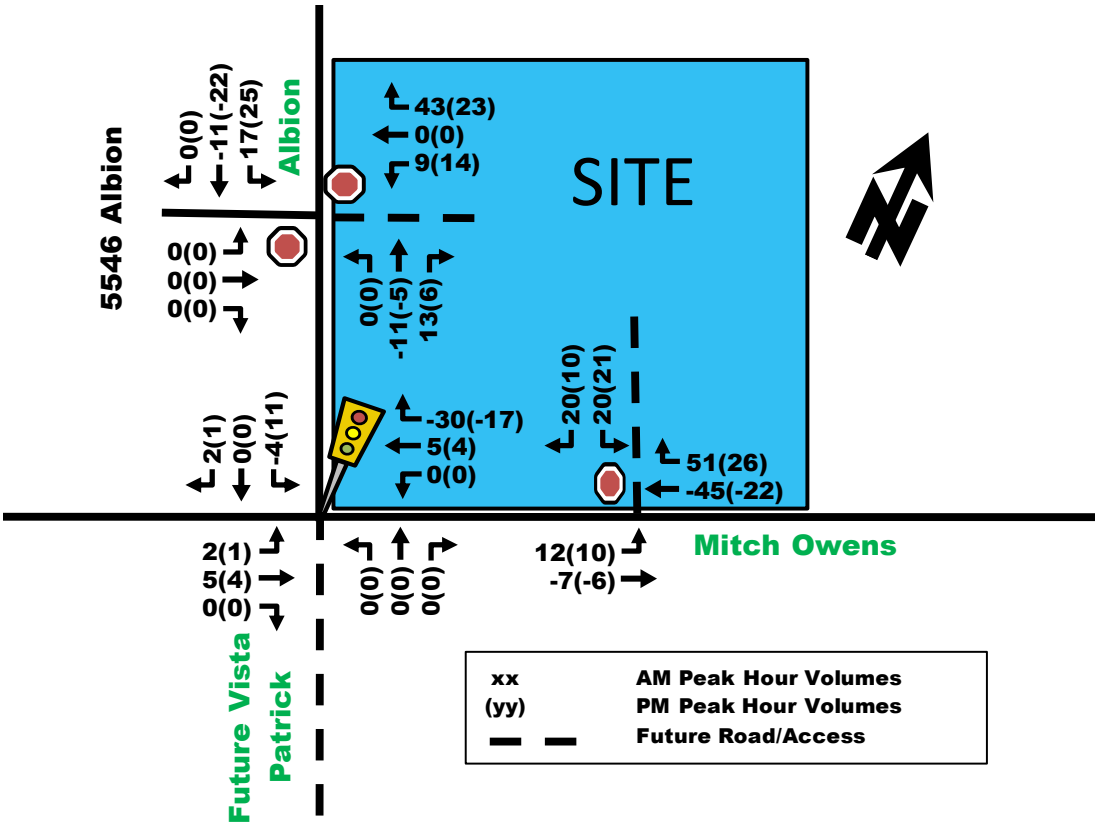
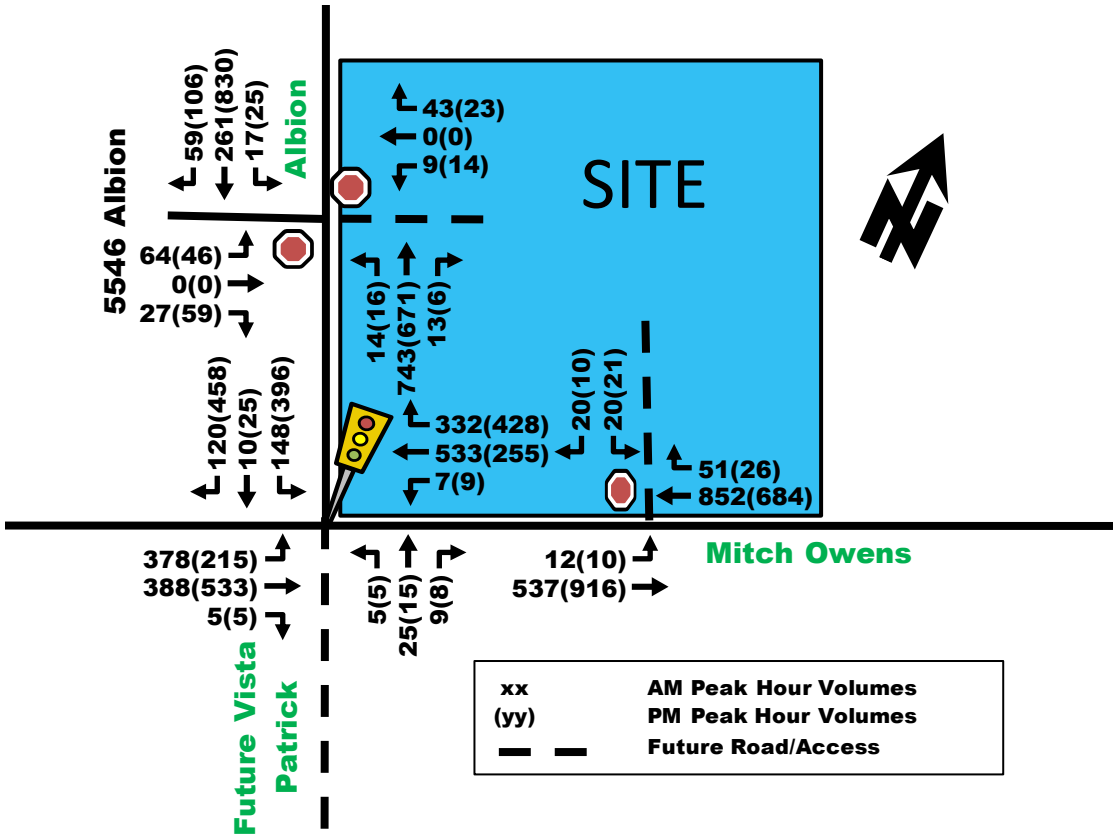


Figure 8: Future Forecasted Volumes with Proposed Development



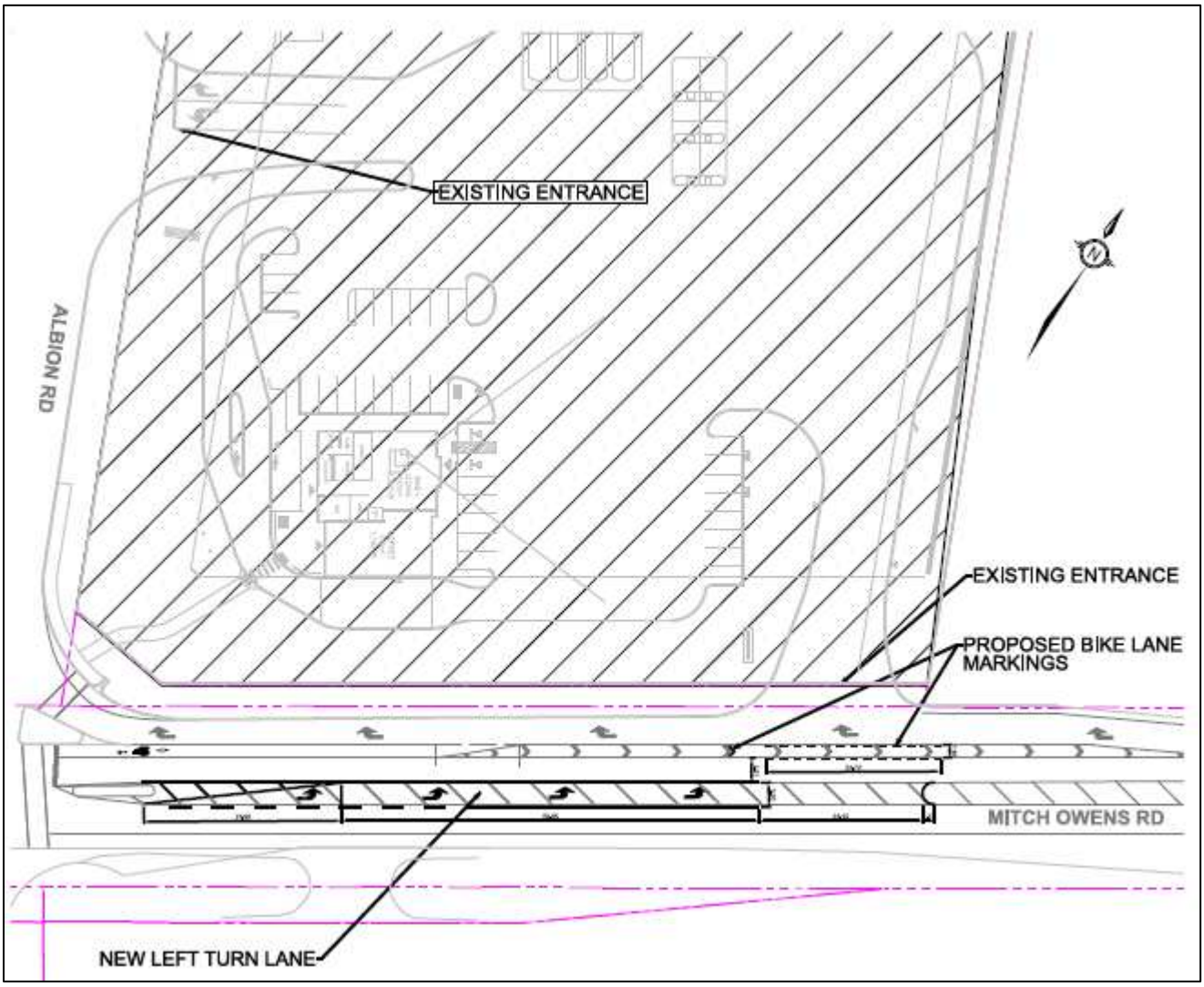
4.0 SITE ACCESS AND CIRCULATION

4.1 Road Modification

Although the eastbound left-turn volumes from Mitch Owens Rd to the site are forecasted to be less than 15 vehicles during the peak hours (in the range of one turning vehicle every 4 minutes), the City of Ottawa has requested that a left-turn auxiliary lane be provided given the high operating posted speed of 80km/h on Mitch Owens Rd.

The Mitch Owens Site Access is located approximately 95m east of the Albion/Mitch Owens intersection. Due to the high operating speeds on Mitch Owens Rd, there is insufficient room between the access and the Albion/Mitch Owens intersection to provide sufficient taper length and deceleration lane that meets TAC Guidelines. However, based on discussion with City Staff, it was still decided that it would be a safer alternative than not providing an auxiliary lane at all. For this reason, a Road Modification Approval (RMA) was prepared in support of a new auxiliary left-turn lane which would use the existing painted gore strip and add use the space available between the access and the intersection. The latest design proposes a 59 meter long auxiliary turn lane plus a 28 meter long taper. The proposed road modification has been illustrated in **Figure 9**, with detailed RMA application provided in **Appendix F.**

Figure 9: Proposed Eastbound Left-Turn Treatment



4.2 Site Access

The site plan proposes two, all-way movement site access:

- One site access to Albion Road opposite the existing gas station access and located approximately 100m to the north of the Albion/Mitch Owens intersection. This access would accommodate all movements. It provides a clear throat length of approximately 30m.
- One site access to Mitch Owens Rd, located approximately 100m to the east of the Albion/Mitch Owens intersection. This access would accommodate all movements. It provides a clear throat length that is less than 30m.

The City of Ottawa Private Approach By-law No. 2003-447 (PABL) was reviewed for both site accesses:

- The site accesses are wider than the 9m maximum as designated by the Private Approach Bylaws. The access dimensions are required to facility truck operations to and from the site.
- The Albion Rd frontage is approximately 180m long and the Mitch Owens Rd frontage is approximately 120m long, which based on Private Approach Bylaws, allows for two, two-way private approach per frontage. This limit has not been exceeded.
- Both accesses are proposed to have a grade of less than 2% incline within the private property for a distance of 9.0m to the curb line, meeting the bylaw.
- The Albion Rd access provides more than 3m separation from the abutting property line thus meeting PABL. The Mitch Owens Rd access does not meet the desired 3m separation from the abutting property line but does meet the absolute minimum separation requirement of 0.3m from the adjacent property line. The location for the Mitch Owens Rd access was placed as far away as possible from the Albion/Mitch Owens intersection in an effort to reduce conflicts with the auxiliary turn lanes and occasional queues expected during the peak hours. The access was also located in a way to maximize available land usage within the site and improve larger truck circulation within.
- As required by part m section ii (both adjacent roads being an arterial and providing access to parking spaces with a range of 49 or less spaces), the minimum distance between the proposed access and the nearest adjacent intersecting street line is 18m. The nearest adjacent intersecting street is Albion/Mitch Owens for both site accesses, which are located approximately 70m and 95m away for the Albion Rd and Mitch Owens Rd accesses respectively, and thus meets the requirements.

In addition, the following checks were performed:

- As per TAC Chapter 8, a throat length of 25m is required for a fast-food restaurant with a GFA of less than 200m^2. Both accesses provide approximately 30m of throat length thus meeting the requirement.
- The site exceeds the minimum requirements from the City of Ottawa Provisions for Drive-Through Operations By-Law (Section 112), which requires a minimum of 7 vehicle queueing space before the coffee shop order board and a minimum total of 11 vehicles for the drive-through. The latest design proposes space for at least 16 vehicles within the drive-through aisle and provides space for at least 7 vehicles to queue prior to the order window. A queuing space dimensions of 3 m wide and 5.7 m long were used.

4.3 Site Circulation

Pedestrians wishing to access the site from Mitch Owens Rd can cross at the traffic signal at Albion/Mitch Owens and proceed through the newly proposed sidewalk which crosses the drive-thru downstream of the order windows and vehicle merge spot, reducing the length of laneway crossed and limiting it to a single vehicle conflict rather than two lanes. Due to the queueing nature of a drive-thru and vehicles waiting to pay and pick-up their orders, their speeds are anticipated to be very slow. Zebra stripe crossing marks are proposed to emphasize additional caution for drivers crossing the pedestrian path.

AutoTurn software was used to review truck turning requirements to access the site and internal to the site. Note that right-turning maneuvers are more critical than left-turning maneuvers, therefore only right-turning maneuvers are shown. **Figure 10** (and higher resolution **Appendix G**) illustrates the turning maneuvers entering the site from Mitch Owens Rd.

The curb radii were designed to fit WB-20 inbound and outbound trucks at this access, which is considered suitable for a fuel truck which is a weekly occurrence. A curb radius of 10m was used to accommodate this movement.

The figure suggests that a minor overlap could occur if a truck is departing the site as one is arriving from the Mitch Owens Rd access, however it should be acknowledged that AutoTurn tends to be slightly more conservative than real-life maneuvering. The WB-20 fuel truck would arrive once per week, so this conflict is considered reasonable.

Figure 11 illustrates the Albion Rd access which can accommodate WB-20 trucks exiting the site and MSU garbage trucks entering the site. A WB-20 would be able to enter via Albion Rd but may have difficulties turning around to access the commercial cardlock and it is therefore recommended to use Mitch Owens Rd access instead to enter the site (unless the truck fuels facing east and exits via Mitch Owens Rd access). This access is also proposed as wider than the 9m suggested private approach width (at approximately 27m flaring at the curb line and 11m corridor width within the site) but is deemed required for trucking operations. Note that this access has an auxiliary left-turn lane out, requiring further width.

Garbage truck circulation has been illustrated with violet color with no issues identified.

Figure 10: Vehicle Turning Maneuvers at Mitch Owens Access

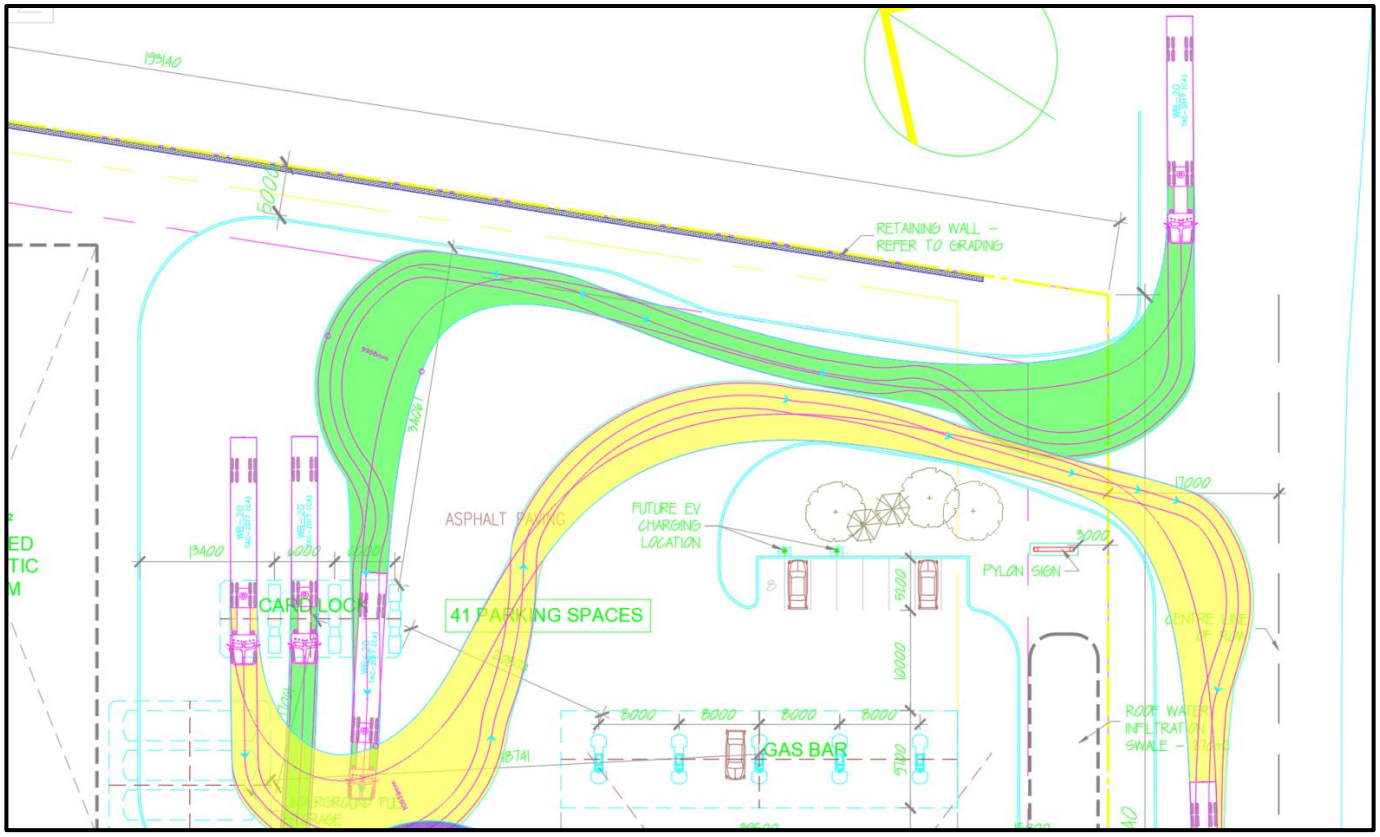
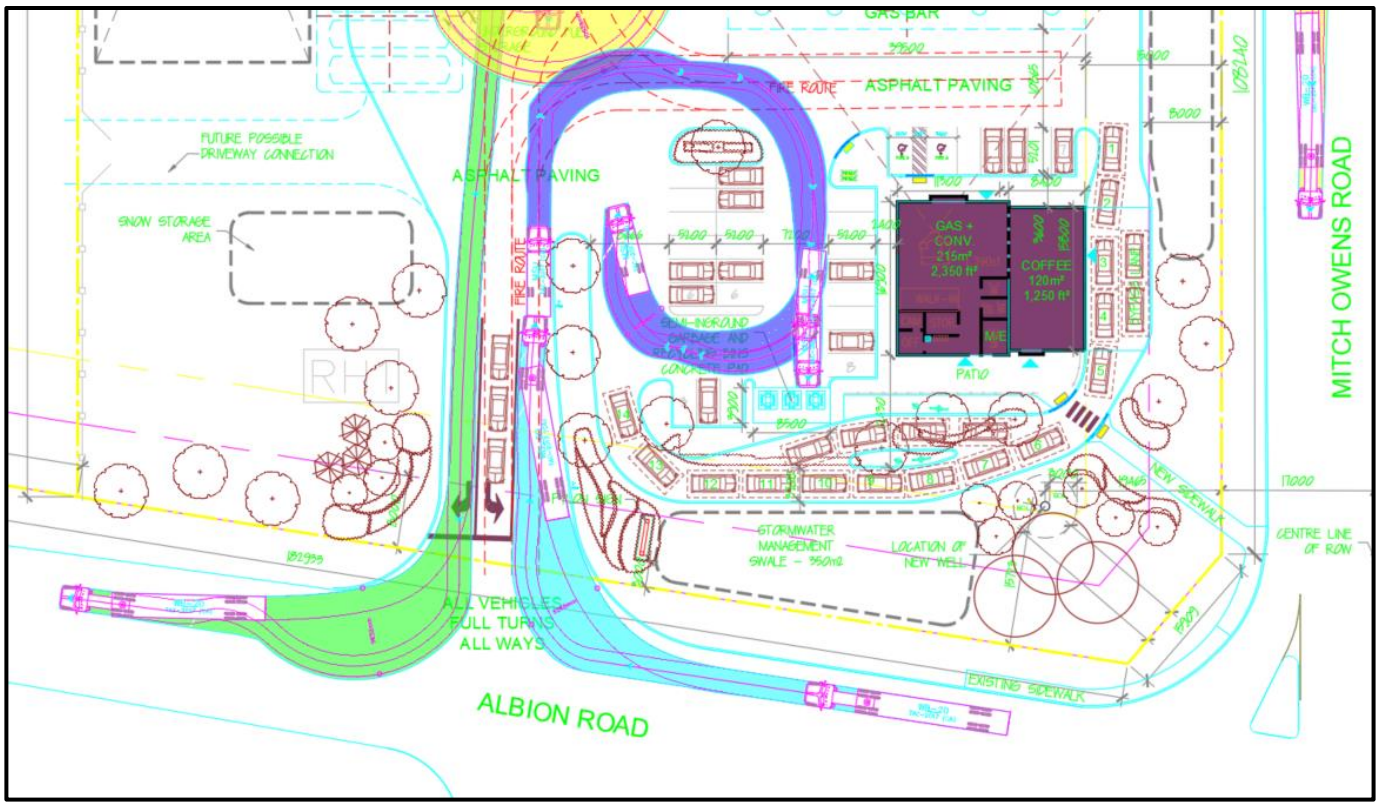


Figure 11: Vehicle Turning Maneuvers at Albion Access



5.0 FUTURE INTERSECTION PERFORMANCE

The 2030 (full buildout plus 5 years) total forecasted volumes (**Figure 8**) were analyzed in Synchro modelling software to determine the forecasted intersection performance. **Table 11** summarizes the intersection performance with the detailed traffic analysis provided in **Appendix H**.

Table 11: Future Intersection Performance with Development - 2030

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LOS	max. v/c or avg. delay (s)	Movement	Delay (s)	LOS	v/c
Albion/Mitch Owens[1]	E(F)	0.94(1.07)	EBL(SBT)	36.2(35.4)	D(D)	0.90(0.88)
Albion Access	E(F)	40(82)	EB(EB)	4(6)	A(A)	-
Mitch Owens Access	C(E)	24(38)	SB(WB)	1(1)	A(A)	-
Mitigation and Sensitivity Analysis						
Albion/Mitch Owens 90s[2]	E(E)	0.94(0.97)	EBL(SBT)	35.1(30.4)	D(D)	0.89(0.81)
Albion Access 20%[3]	D(D)	33(33)	EB(EB)	4(3)	A(A)	-

Note: Analysis assumes a PHF of 1.00 for future conditions and a saturation flow rate of 1800 veh/h/lane.
1. *Albion/Mitch Owens modelled as a four-legged intersection based on future intersection design; intersection optimized in Synchro.*
2. *Albion/Mitch Owens cycle length increased from 75s to 90s.*
3. *Albion Access, 20% of left-turns out of the site redistributed as right-turns out of the site (change in route or change in gas station choice)*

Overall, the addition of this development showed negligible changes to the Albion/Mitch Owens intersection operations compared to background conditions, indicating that the changes in performance from existing conditions to future conditions is a reflection of background traffic growth. The development is anticipated to have a negligible impact on Albion/Mitch Owens. Similar to background forecasted conditions, increasing the signal cycle length from existing 75s to 90s would result in critical movements operating within acceptable city performance at the expense of slightly longer queues.

The site accesses may occasionally experience some delays, predominantly during the PM peak hour, specifically for left-turning movements out of the site or the adjacent MacEwen site. The Mitch Owens Access is still within city acceptable performance; however, the Albion Access continues to have delays exceeding the desired 50s delays or less for critical movements, similar to background conditions. The delays at the Albion Access slightly increased with the addition of the Stinson Gas Station as there would then be even more turning movements at this unsignalized intersection.

Some customers may opt to change their route to exit via a right-turn instead (expected to have shorter delays), while others might wait for an opening or to be let through if queues extend past the access. Gaps are also likely to occur with the influence of the adjacent traffic signal allowing for platoons of vehicles to exit the site during those breaks. Lastly, since both this site and the adjacent site across the street (MacEwens) both provide the same services, it is **very likely** that customers who aren't loyal to a specific brand may opt to use the gas station to the right of their driving direction and thus re-distribute some of the vehicle trips to be more right-turning in and out of the two sites while reducing left-turns in and out of the sites which would significantly reduce forecasted delays. This forecasted redistribution of routes and gas station choice, particularly during more congested peak hours could reduce the anticipated delays to approximately 30s (LoS D and within acceptable city performance) if 20% of outbound vehicles exit the gas stations via a right-turn instead of a left-turn. As a whole, the access intersections operate very well.

Table 12: AM and PM Peak Hour Queues

Movement at Albion/Mitch Owens Intersection	Storage Length	Distance to Access	Queue AM (PM) in meters			
			75s Cycle (Existing)		90s Cycle (Mitigated v/c)	
			50th Percentile	95th Percentile	50th Percentile	95th Percentile
Eastbound Left	250m	-	61(31)	#112(#69)	64(36)	#115(#69)
Eastbound Through	-	-	24(53)	57(#131)	24(67)	56(#145)
Westbound Through	-	95m	84(31)	**#146**(53)	87(40)	**#149**(65)
Westbound Right	185m	95m	0(0)	17(21)	0(0)	17(25)
Southbound Through-Left	150m	70m	25(65)	#55(**#115**)	27(68)	#59(**#125**)
# 95th percentile volume exceeds capacity; queue may be longer.						

As shown in the table above, the westbound through queue may occasionally extend beyond the Mitch Owens Rd Access during the AM peak hour and the southbound through-left queue may occasionally extend beyond the Albion Rd Access, but on average, queues are not expected to extend beyond the site access during peak hours. Outside of peak hours, queues are anticipated to be even shorter. If queues extend beyond the site access, it is common behavior within the City of Ottawa for a queueing driver to leave a gap to allow drivers to exit or enter the site, providing gaps along the queue for accesses. All queues are within the available auxiliary turn lane storage capacity.

Although the Mitch Owens Rd access is delineated as a single outbound lane, the lane is very wide to accommodate large trucks entering and exiting the site. It is anticipated that smaller 'P-car' vehicles turning left will be able to queue without obstructing space for right-turning vehicles, allowing them to bypass the left-turners. As such, the Mitch Owens Rd access will perform more similarly to an access having both an outbound left- and right-turn lane. Minor queues are anticipated internal to the site during the peak hours. The intersections 'as a whole' are anticipated to operate acceptably given the conservative analysis. Increasing the cycle length to 90s resulted in minor increases to queues. The city has a choice of keeping the cycle length at Albion/Mitch Owens at existing 75s with some critical movements surpassing a v/c of 1.0, or could increase the cycle length to 90s at the expense of minor increases in queues.

6.0 CONCLUSIONS

W.O. Stinson and Son Ltd is proposing a new gas station with a convenience store, a commercial cardlock and coffee shop with a drive-through facility at the address of 5545 Albion Rd, located on the northeast corner of Albion Rd and Mitch Owens Dr.

This Addendum #2 has been prepared as a supplement to the Strategy Report prepared in October of 2019. Traffic counts at the Albion/Mitch Owens intersection have been refreshed as of this year and a new trip generation has been updated to reflect the latest land uses and proposed development site. The latest trip generation forecasts approximately

230 to 170 total person trips, with 185 to 135 vehicle trips inclusive of pass-by trips, and a net new 35 to 25 new vehicle trips expected to be generated for the AM and PM peak hours respectively.

Other known area development trip generation have been layered on to existing traffic volumes plus a 0.5% annual background growth on all arterial-to-arterial movements. The existing, background and future forecasted volumes were then inputted into Synchro software. Overall, the model showed that the proposed development played a minimal impact on worsening traffic conditions on the surrounding study network. The intersections of Albion/Mitch Owens and Albion Access showed to have critical movements at an LoS 'F'. Increasing the signal cycle length at Albion/Mitch Owens and redistributing only a handful of left-turns to right-turns at Albion Access resulted in improvements to intersection performance to within acceptable levels of service for the city.

The development meets all of the Private Approach By-laws with the exception of two elements:

- The site accesses are wider than the 9m maximum as designated by the Private Approach Bylaws. The access dimensions are required to facility truck operations to and from the site.
- The Mitch Owens Rd access is proposed less than 3m from the adjacent property line but still meets the bare minimum 0.3m offset requirement.

As requested by the City of Ottawa, a short westbound left-turn lane will be added for the Mitch Owens Access within the existing paint gore line on Mitch Owens Rd due to the roadway operating speeds.

Based on the preceding addendum, the proposed development located at 5545 Albion Rd is recommended from a transportation perspective.

Prepared By:

Juan Lavin, P. Eng.

Transportation Engineer

Reviewed By:

Jake Berube, P.Eng. RSP1

Transportation Engineer

Document Control Page

CLIENT:	W.O. Stinson & Son Ltd			
PROJECT NAME:	W.O. Stinson & Son Ltd – 5545 Albion Rd			
REPORT TITLE:	TIA Addendum #2			
PARSONS PROJECT NO:	477176 - 01000			
DIGITAL MASTER:	\\XCCAN57FS01\Data\IS0\477176\1000\DOCS\2025-01-24 New SP Memo\Stinsons Addendum #2 - FINAL - 2025.05.30.docx			
HISTORY:	**Version**		**Originator**	**Reviewer**
	Original TIA	2019-10-03	Juan Lavin, P.Eng.	Mark Baker, P.Eng.
	Addendum #1:	2023-09-29	Basel Ansari, P.Eng.	Jake Berube, P.Eng.
	Addendum #2:	2024-11-28	Juan Lavin, P.Eng.	Jake Berube, P.Eng.
	Addendum #2:	2025-01-24	Juan Lavin, P.Eng.	Jake Berube, P.Eng.
	Addendum #2:	2025-05-30	Juan Lavin, P.Eng.	Jake Berube, P.Eng.

APPENDIX A

TIA Addendum #1

1223 Michael Street North, Suite 100 | Ottawa, ON K1J 7T2
P: +1 613.738.4160 | F: +1 613.739.7105 | www.parsons.com

Memorandum

To: Mike Giampa, P. Eng

From: Basel Ansari, P.Eng., Jake Berube, P.Eng.

Cc: Barrett Wagar RPP, MCIP, M.PL

Date: September 29, 2023

Project: 477176 - 01000

Subject: W. O. Stinson & Son Ltd. – 5545 Albion Road
TIA Addendum Memo

1.0 Purpose

Parsons has been retained by W.O. Stinson & Son Limited to prepare a Transportation Impact Assessment Addendum in support of the proposed Site Plan Control application located at the municipal address of 5545 Albion Road. A Transportation Impact Assessment (TIA) Strategy Report by Parsons was previously completed and submitted to the City of Ottawa in October 2019. The previous TIA considered the development of the 5505 and 5545 Albion Road parcels which were to include a gas bar, a drive-through restaurant, a commercial cardlock gas bar, a service building and a fleet parking lot for service trucks.

Since then, discussions with the City led to modifications to the Site Plan where the gas bar, drive-through restaurant and commercial cardlock gas bar were removed, while the service building and the fleet parking lot for trucks were to be kept as part of the proposed development located on the 5545 Albion Road property. The updated Site Plan has been provided in **Appendix A**. A new buildout date of 2024 is assumed for the proposed development.

Following the pre-consultation with City Staff, the purpose of this TIA Addendum Memo is to provide a transportation update with regards to the trip generation of the site and the traffic operations at the adjacent signalized intersection of Albion/Mitch Owens in both existing and full buildout (2024) conditions. The site circulation at the proposed Albion Road access and on-site have also assessed.

2.0 Existing Conditions

A traffic count for the intersection of Albion/Mitch Owens (dated October 16, 2019) was obtained from the City of Ottawa (provided in **Appendix B**), of which the morning and afternoon peak hour traffic volumes are illustrated in **Figure 1**.

Intersection capacity analysis was conducted for existing conditions using Synchro 11 traffic analysis software according to the City of Ottawa TIA Guidelines. The Albion/Mitch Owens intersection was assessed in terms of the volume-to-capacity (v/c) ratio and the corresponding Level of Service (LOS) for the critical movement, as well as an overall intersection v/c ratio and corresponding LOS. Detailed Synchro reports are provided in **Appendix C**.

Figure 1: Albion/Mitch Owens 2019 Existing Peak Hour Traffic Counts

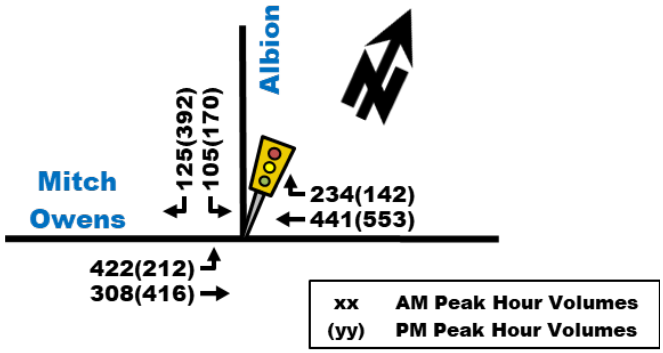


Table 1: Existing Intersection Operations

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LOS	max. v/c or avg. delay (s)	Movement	Delay (s)	LOS	v/c
Albion/Mitch Owens	C(**F**)	0.79(**1.23**)	EBL(WBT)	20.8(55.9)	C(**E**)	0.76(**0.97**)
Note: Analysis of assumes a PHF of 0.90 for existing conditions and a saturation flow rate of 1800 veh/h/lane.						

Existing conditions intersection operations indicate that the intersection 'as a whole' operates with a poor LOS 'E' during the peak morning hour of travel. The critical WBT movement operates at capacity during the afternoon peak hour. Observed queue lengths in Synchro indicate that the 95th percentile queue lengths of all turning movements do not exceed their available respective storage lengths. The heavier southbound left-turn queue was observed to be 45m during the PM peak according to Synchro 95th percentile. The site access is proposed approximately 70m north of Mitch Owens Rd, which would not be in the influence of the southbound left-turn queue.

3.0 Proposed Access

A single access will be provided for the site and will be located along the east side of Albion Rd, across from the existing access to the MacEwen gas station and approximately 70m north of the Albion/Mitch Owens intersection. The proposed site access is located within the southbound left-turn auxiliary lane. Full movements are expected to be permitted in/out of site, with stop control provided on the westbound leg for vehicles exiting the site as shown in the Site Plan in **Appendix A**. As per existing, the northbound approach is expected to consist of a shared movement lane, while the southbound approach is expected to make use of the auxiliary southbound left-turn to access the site.

Truck turning movements in/out of site have been assessed as shown in the drawings provided in **Appendix D** and no issues have been identified with regards to trucks accessing the site. The site access is to provide a gate control with a throat length exceeding 20m. The gate will remain open during business hours and be closed during off-hours and weekends. Employees will have a FOB device to access the gate, as required. No queueing issues are anticipated. The throat length of the access, the width of the access and the distance between the access and the Albion/Mitch Owens signal are all considered acceptable based on the requirements of the Transportation Association of Canada (TAC) Guidelines and City of Ottawa Private Approach By-Law.

4.0 Site Statistics and Trip Generation

The proposed development will consist of a service building and fleet parking lot for a variety of service trucks. The previous 2018 TIA provided trip generation for this land use using data obtained from a proxy site for Stinson and Son located at 1395 Greely Ln. Based on the data obtained, the proposed land uses are expected to generate a negligible 4 vehicle trips during both the morning and afternoon peak hours, given the proposed building size of 13,670ft^2. This reflects that most trips to and from the site are outside typical peak hours. The anticipated trip generation is provided in **Table 2** below.

Table 2: Proposed Land Use Trip Generation

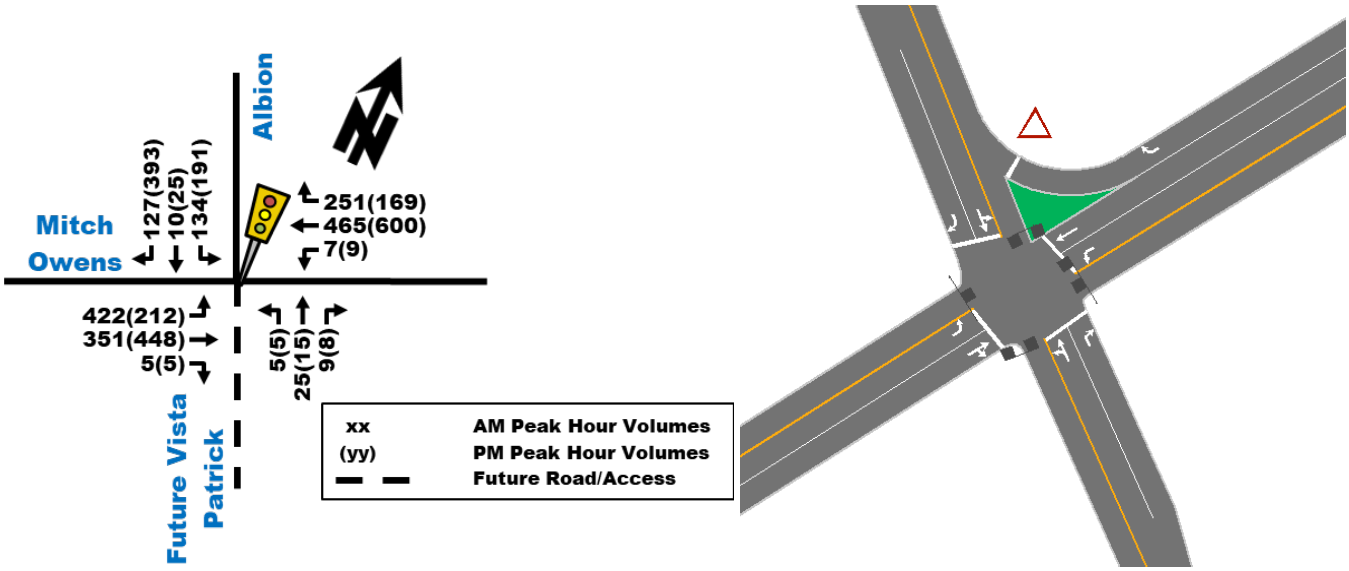
Land Use	Data Source	Size (ft^2)	AM Peak (veh/h)			PM Peak (veh/h)		
			In	Out	Total	In	Out	Total
Vehicle Service/Fleet Parking	Proxy Site: 1395 Greely Ln	13,670	0	4	4	4	0	4

5.0 Analysis

Anticipated total projected 2024 traffic volumes are illustrated in **Figure 2** and include the expected site-generated volume of 4 vehicles during peak hours. To be consistent with the analysis conducted in the 2019 TIA, a conservative background growth rate of 1% was applied to all traffic movements at the intersection of Albion/Mitch Owens. Additionally, traffic volumes expected to be generated by the two adjacent developments identified in the 2019 TIA, south of Mitch Owens Rd (at 6690 Mitch Owens Rd and 1000 Vista Barrett Priv/1121 Stagecoach Rd), have been included.

It should be noted that the intersection of Albion/Mitch Owens is expected to provide a south leg in the future, as part of an access to the two future adjacent developments. As part of this modification, the intersection will undergo some reconfiguration to lane arrangements to accommodate movements to/from the south leg. The anticipated future intersection design is also illustrated in **Figure 2**.

Figure 2: Total Projected 2024 Peak Hour Traffic Volumes and Intersection Design



Similar to existing conditions, intersection capacity analysis was conducted for total projected 2024 conditions using Synchro 11 traffic analysis software. The analysis results are provided in **Table 3**, with detailed Synchro reports provided in **Appendix C**.

Table 3: Total Projected 2024 Intersection Operations

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection 'as a whole'		
	LOS	max. v/c or avg. delay (s)	Movement	Delay (s)	LOS	v/c
Albion/Mitch Owens*	C(D)	0.77(0.90)	SBT(SBT)	18.8(22.1)	C(C)	0.71(0.77)
Note: Analysis of assumes a PHF of 1.00 for future conditions and a saturation flow rate of 1800 veh/h/lane. **Albion/Mitch Owens modelled as a four-legged intersection based on future intersection design; intersection phase splits optimized in Synchro.*						

With the proposed new design of the intersection of Albion/Mitch Owens and the optimization of phase splits in Synchro, the intersection is expected to operate significantly better compared to existing conditions. The intersection 'as a whole' operates at LOS 'C' during peak hours, with critical movements operating at LOS 'D' or better. Similar to existing conditions, the 95th percentile queue lengths of all turning movements do not exceed their available respective storage lengths.

With regards to the site access, given the low anticipated site generated traffic volumes, there are no anticipated issues with regards to its operations. The 95th percentile queue length at the SB approach of the intersection of Albion/Mitch Owens is expected to be up to approximately 66m during peak hours, which does not extend past the 70m distance to the proposed site access along Albion Rd. The 95th percentile queue length represents a worst-case scenario that will not be experienced consistently during peak hours.

6.0 Closing

The revised Site Plan, when compared to the previous TIA submission, results in a significantly lower number of trips generated by the proposed development during peak hours altogether which can be considered to have a negligible impact on the surrounding transportation network.

Analysis indicates that with the future intersection design at Albion/Mitch Owens and optimization of phase splits will result in better traffic operations at the intersection compared to existing. The observed 95th percentile queue lengths are not expected to exceed available storage lengths at the intersection of Albion/Mitch Owens, or cause a blockage to the proposed site access along Albion Rd. There are no concerns with regards to the location of trucks entering/exiting the proposed access.

Therefore, the revised site plan for 5545 Albion Road is recommended to proceed from a transportation perspective.

Prepared By:

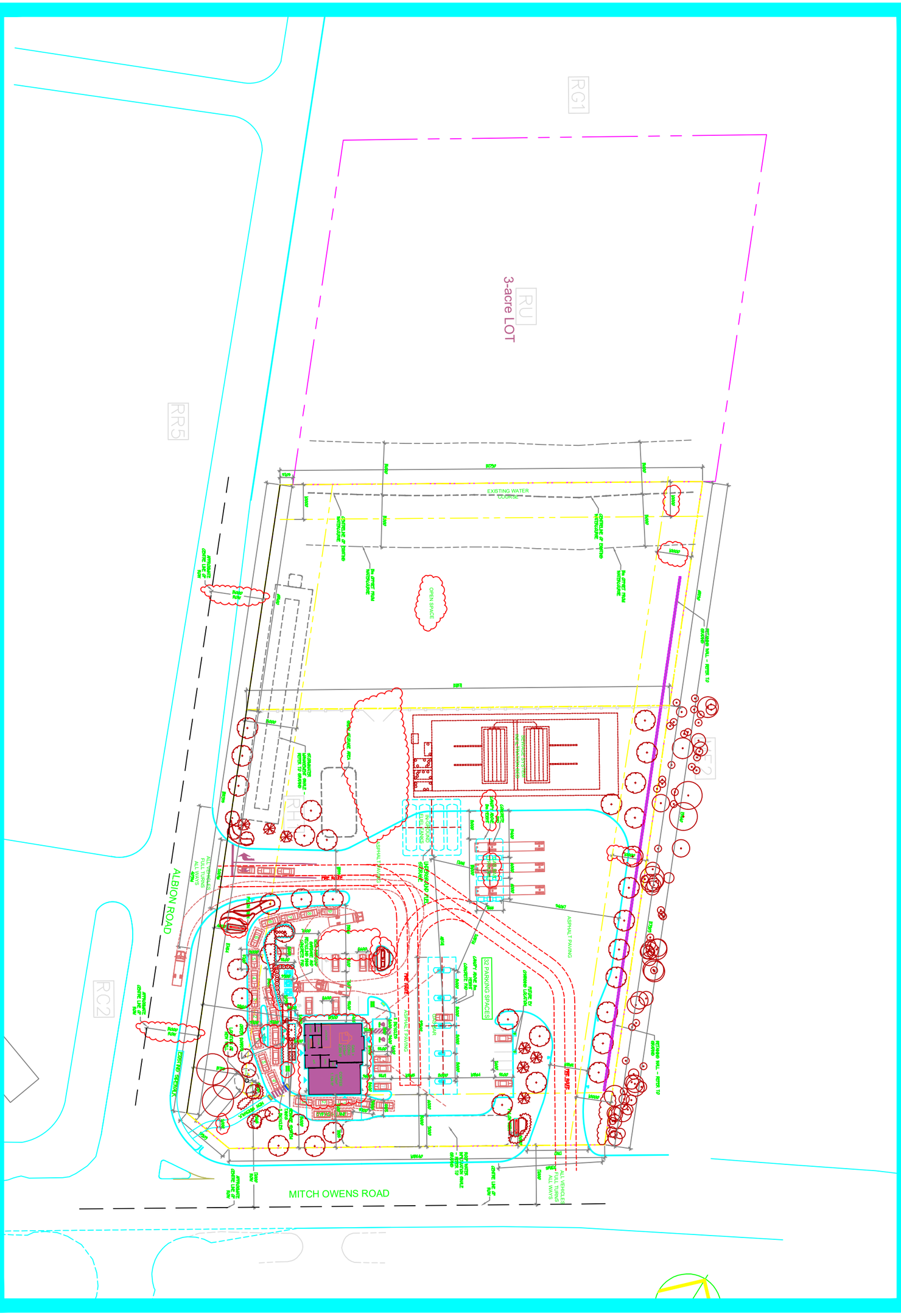
Basel Ansari, P.Eng.
Transportation Engineer

Reviewed By:

Jake Berube, P.Eng.
Transportation Engineer

APPENDIX B

Site Plan



W.O. STINSON & SON LTD.

W.O. STINSON & SON LTD.

ALBION RD. & MITCH OWENS ROAD

SITE PLAN

scale 1:1000

September 12, 2024

HOBIN ARCHITECTURE

APPENDIX C

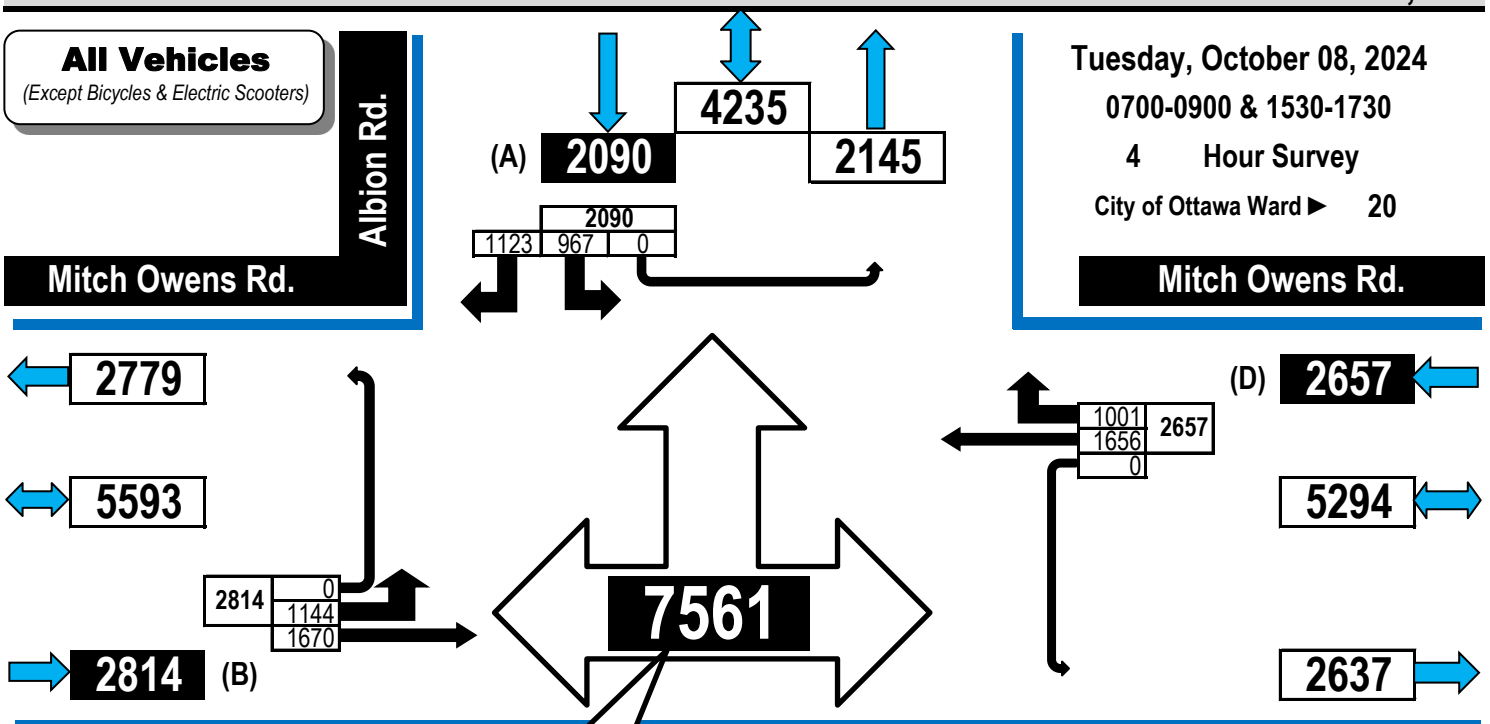
Updated Traffic Counts (October 8, 2024)

Turning Movement Count
Summary, AM and PM Peak Hour Flow Diagrams
All Vehicles Except Bicycles

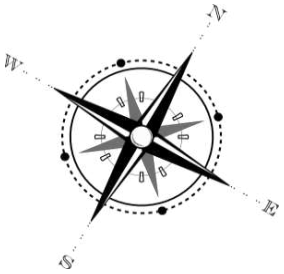
Albion Road & Mitch Owens Road — Gloucester, ON

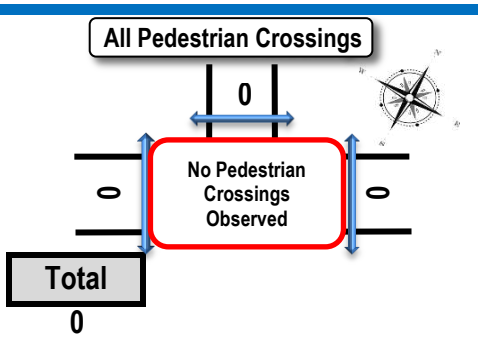
All Vehicles
(Except Bicycles & Electric Scooters)

Tuesday, October 08, 2024
0700-0900 & 1530-1730
4 Hour Survey
City of Ottawa Ward ▶ 20

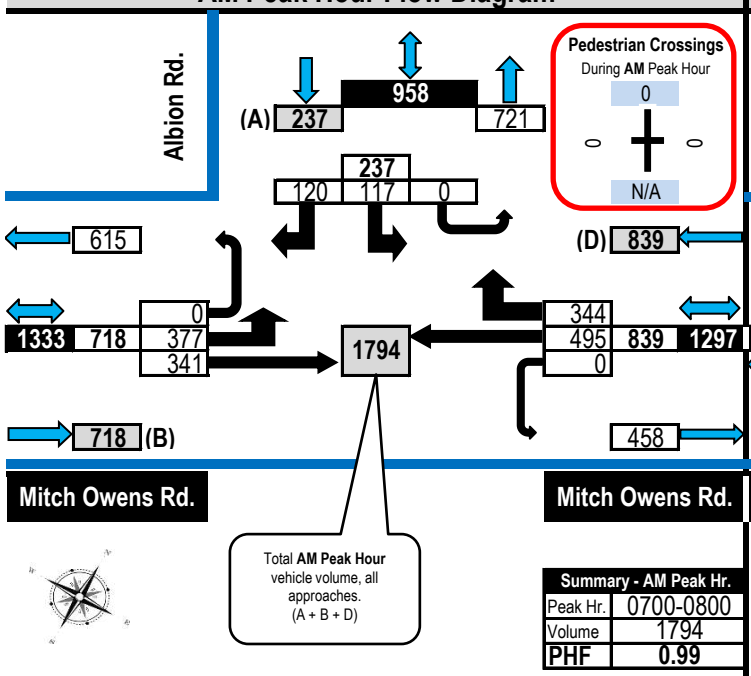


Total vehicle volume, all approaches. (A + B + D)





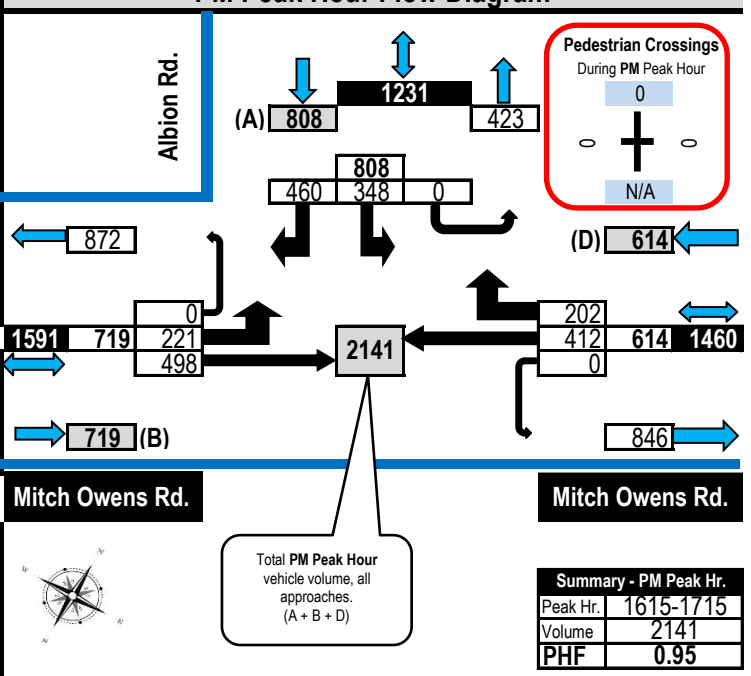
AM Peak Hour Flow Diagram



Total **AM Peak Hour** vehicle volume, all approaches. (A + B + D)

Summary - AM Peak Hr.	
Peak Hr.	0700-0800
Volume	1794
PHF	0.99

PM Peak Hour Flow Diagram



Total **PM Peak Hour** vehicle volume, all approaches. (A + B + D)

Summary - PM Peak Hr.	
Peak Hr.	1615-1715
Volume	2141
PHF	0.95

Turning Movement Count
Heavy Vehicle Summary (FHWA Class 4-13)
Flow Diagram

Albion Road & Mitch Owens Road — Gloucester, ON

Heavy Vehicles
(Construction Vehicles, Heavy Trucks, Buses & School Buses).
Heavy vehicle totals ARE included in the all vehicles summary and flow diagrams.

Albion Rd.

Mitch Owens Rd.

(A) 175 | 350 | 175

175 → 92 | 83 | 0

Tuesday, October 08, 2024
0700-0900 & 1530-1730
4 Hour Survey
City of Ottawa Ward ► 20

Mitch Owens Rd.

333
685
352 → 0 | 103 | 249
352 (B)

840

(D) 313
72 | 241 | 313 → 0
645
332

Total heavy vehicle volume, all approaches. (A + B + D)

Heavy Vehicles Comprise **11.11%** of Total Traffic

All Pedestrian Crossings
0
0 0

Total
0

	Mitch Owens Rd.					Mitch Owens Rd.					N/A					Albion Rd.					
	Eastbound					Westbound					Northbound					Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	21	55		0	76		76	24	0	100						10		24	0	34	210
0800-0900	26	72		0	98		70	25	0	95						23		23	0	46	239
1530-1600	17	34		0	51		27	7	0	34						16		11	0	27	112
1600-1700	25	66		0	91		42	11	0	53						27		28	0	55	199
1700-1730	14	22		0	36		26	5	0	31						7		6	0	13	80
Totals	103	249		0	352		241	72	0	313						83		92	0	175	840

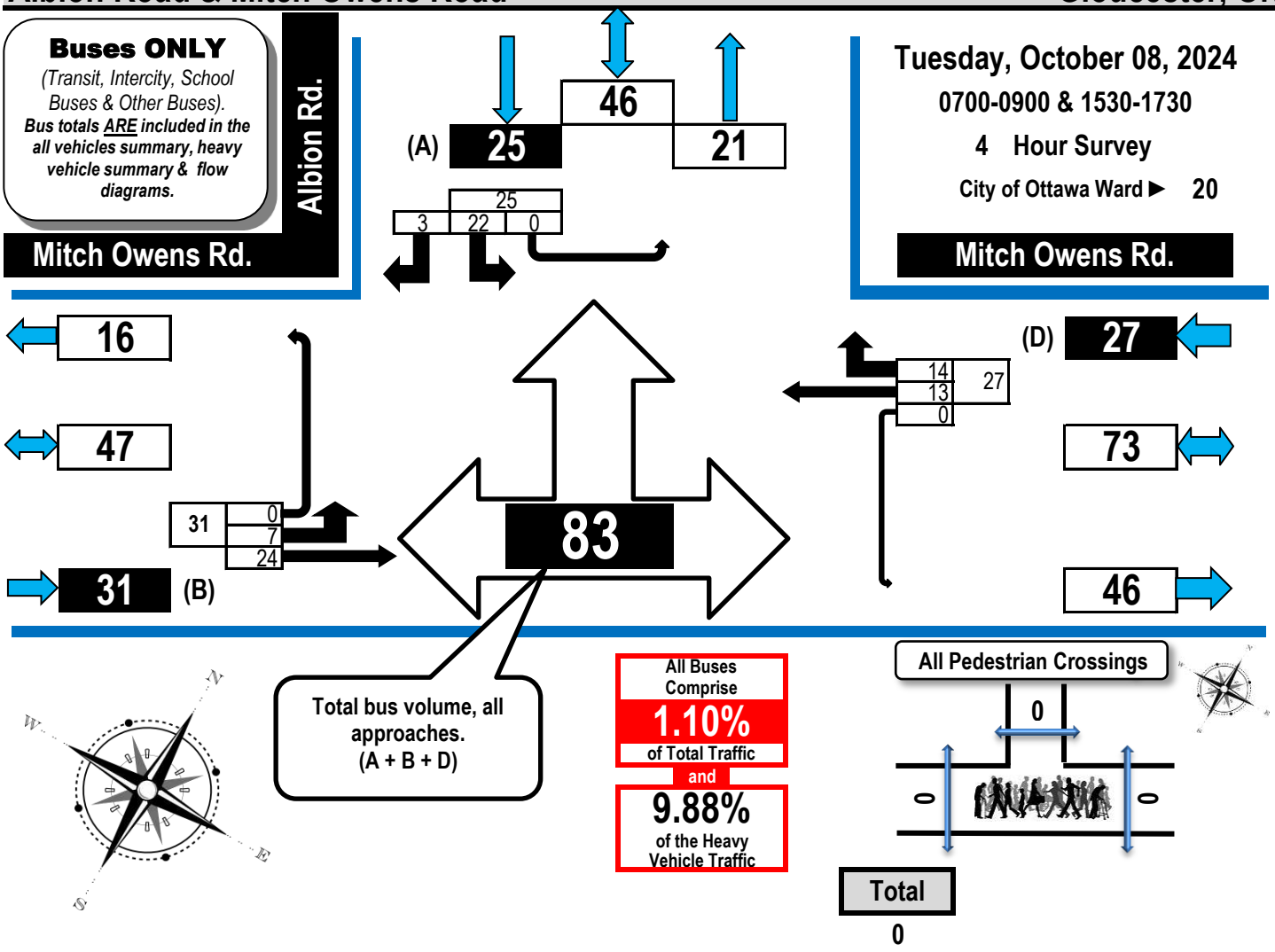
Turning Movement Count
All Buses Summary (FHWA Class 4 ONLY)
Flow Diagram

Albion Road & Mitch Owens Road — Gloucester, ON

Buses ONLY
(Transit, Intercity, School Buses & Other Buses).
Bus totals ARE included in the all vehicles summary, heavy vehicle summary & flow diagrams.

Albion Rd.

Mitch Owens Rd.



Tuesday, October 08, 2024
0700-0900 & 1530-1730
4 Hour Survey
City of Ottawa Ward ► 20

Mitch Owens Rd.

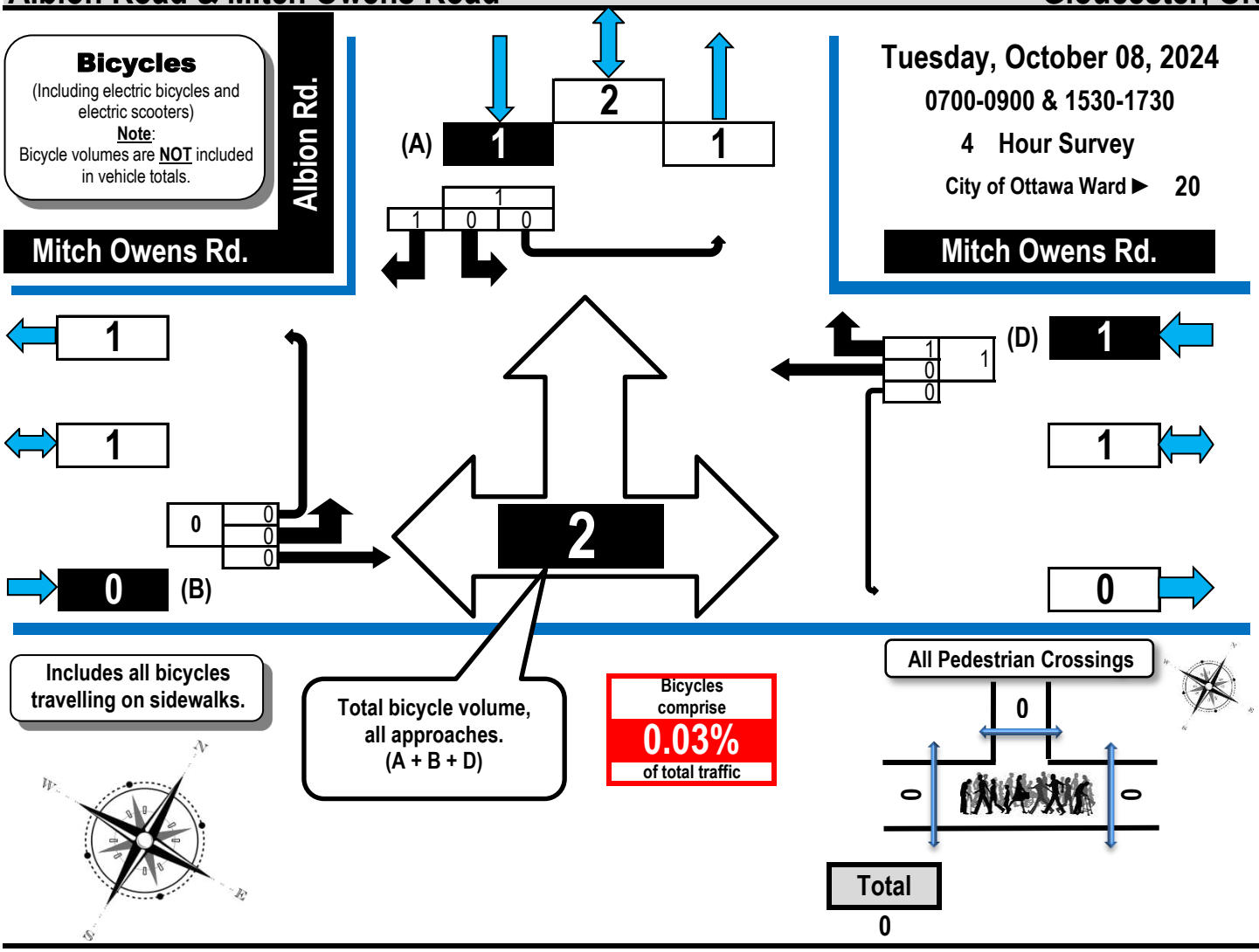
	Mitch Owens Rd.					Mitch Owens Rd.					N/A					Albion Rd.					
	Eastbound					Westbound					Northbound					Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	2	2		0	4		10	5	0	15						2		0	0	2	21
0800-0900	3	6		0	9		1	6	0	7						5		0	0	5	21
1530-1600	0	4		0	4		1	2	0	3						4		0	0	4	11
1600-1700	2	10		0	12		1	1	0	2						10		3	0	13	27
1700-1730	0	2		0	2		0	0	0	0						1		0	0	1	3
Totals	7	24		0	31		13	14	0	27						22		3	0	25	83

Turning Movement Count
Bicycle Summary
Flow Diagram

Albion Road & Mitch Owens Road — Gloucester, ON

Bicycles
(Including electric bicycles and electric scooters)
Note:
Bicycle volumes are **NOT** included in vehicle totals.

Tuesday, October 08, 2024
0700-0900 & 1530-1730
4 Hour Survey
City of Ottawa Ward ► 20



	Mitch Owens Rd.					Mitch Owens Rd.					N/A					Albion Rd.					
	Eastbound					Westbound					Northbound					Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	0	0		0	0		0	0	0	0						0		0	0	0	0
0800-0900	0	0		0	0		0	1	0	1						0		0	0	0	1
1530-1600	0	0		0	0		0	0	0	0						0		0	0	0	0
1600-1700	0	0		0	0		0	0	0	0						0		0	0	0	0
1700-1730	0	0		0	0		0	0	0	0						0		1	0	1	1
Totals	0	0		0	0		0	1	0	1						0		1	0	1	2

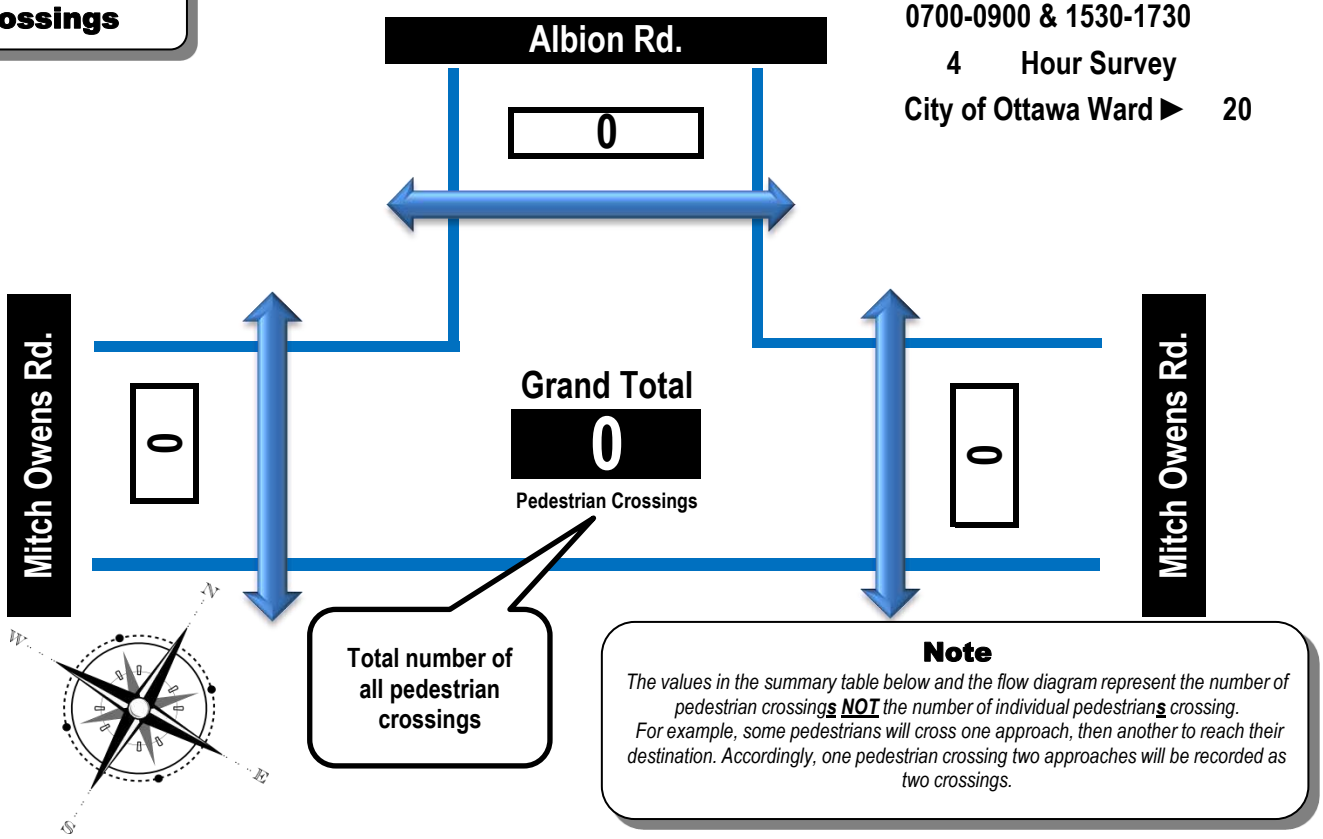
Turning Movement Count

Pedestrian Crossings Summary and Flow Diagram

Albion Road & Mitch Owens Road — Gloucester, ON

Pedestrian Crossings

Tuesday, October 08, 2024
0700-0900 & 1530-1730
4 Hour Survey
City of Ottawa Ward ► 20



Note

*The values in the summary table below and the flow diagram represent the number of pedestrian crossing**s** **NOT** the number of individual pedestrian**s** crossing. For example, some pedestrians will cross one approach, then another to reach their destination. Accordingly, one pedestrian crossing two approaches will be recorded as two crossings.*

Time Period	West Side Crossing Mitch Owens Rd.	East Side Crossing Mitch Owens Rd.	Street Total	South Side Crossing N/A	North Side Crossing Albion Rd.	Street Total	Grand Total
0700-0800	0	0	0		0	0	0
0800-0900	0	0	0		0	0	0
1530-1600	0	0	0		0	0	0
1600-1700	0	0	0		0	0	0
1700-1730	0	0	0		0	0	0
Totals	**0**	**0**	**0**		**0**	**0**	**0**

Comments:

Private buses and school buses comprise 9.88% of the heavy vehicle traffic. No pedestrian crossings were observed.

Turning Movement Count
Summary Report
Including AM and PM Peak Hours
All Vehicles Except Bicycles

Albion Road & Mitch Owens Road — Gloucester, ON

Survey Date: Tuesday, October 08, 2024 **Start Time:** 0700 **AADT Factor:** 0.9

Weather AM: Clear/Sunny 3º C **Survey Duration:** 4 Hrs. **Survey Hours:** 0700-0900 & 1530-1730

Weather PM: Partly Sunny 15º C **Surveyor(s):** J. Mousseau

	Mitch Owens Rd.					Mitch Owens Rd.						N/A					Albion Rd.						
	Eastbound					Westbound						Northbound					Southbound						
Time Period	LT	ST	RT	UT	E/B Tot	LT	ST	RT	UT	W/B Tot	Street Total	LT	ST	RT	UT	N/B Tot	LT	ST	RT	UT	S/B Tot	Street Total	Grand Total
0700-0800	377	341		0	718		495	344	0	839	1557						117		120	0	237	237	1794
0800-0900	336	385		0	721		367	261	0	628	1349						168		153	0	321	321	1670
1530-1630	214	460		0	674		372	199	0	571	1245						369		411	0	780	780	2025
1630-1730	217	484		0	701		422	197	0	619	1320						313		439	0	752	752	2072
Totals	1144	1670		0	2814		1656	1001	0	2657	5471						967		1123	0	2090	2090	7561

Equivalent 12 & 24-hour Vehicle Volumes Including the Annual Average Daily Traffic (AADT) Factor Applicable to the Day and Month of the Turning Movement Count

Expansion factors are applied exclusively to standard weekday 8-hour turning movement counts conducted during the hours of 0700h - 1000h, 1130h - 1330h and 1500h - 1800h

Equivalent 12-hour vehicle volumes. These volumes are calculated by multiplying the 8-hour totals by the 8 ➡12 expansion factor of 1.39

Equ. 12 Hr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Average daily 12-hour vehicle volumes. These volumes are calculated by multiplying the equivalent 12-hour totals by the AADT factor of: 0.9

AADT 12-hr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

24-Hour AADT. These volumes are calculated by multiplying the average daily 12-hour vehicle volumes by the 12 ➡24 expansion factor of 1.31

AADT 24 Hr	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

AADT and expansion factors provided by the City of Ottawa

AM Peak Hour Factor ➡					0.99							Highest Hourly Vehicle Volume Between 0700h & 0900h											
AM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
0700-0800	377	341	0	0	718	0	495	344	0	839	1557	0	0	0	0	0	117	0	120	0	237	237	1794

PM Peak Hour Factor ➡					0.95							Highest Hourly Vehicle Volume Between 1530h & 1730h											
PM Peak Hr	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	LT	ST	RT	UT	Total	LT	ST	RT	UT	Total	Str. Tot.	Gr. Tot.
1615-1715	221	498	0	0	719	0	412	202	0	614	1333	0	0	0	0	0	348	0	460	0	808	808	2141

Comments:

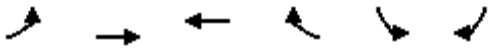
Private buses and school buses comprise 9.88% of the heavy vehicle traffic. No pedestrian crossings were observed.

Notes:

1. Includes all vehicle types except bicycles, electric bicycles, and electric scooters.
2. When expansion and AADT factors are applied, the results will differ slightly due to rounding.

APPENDIX D

Synchro Report: Existing Conditions

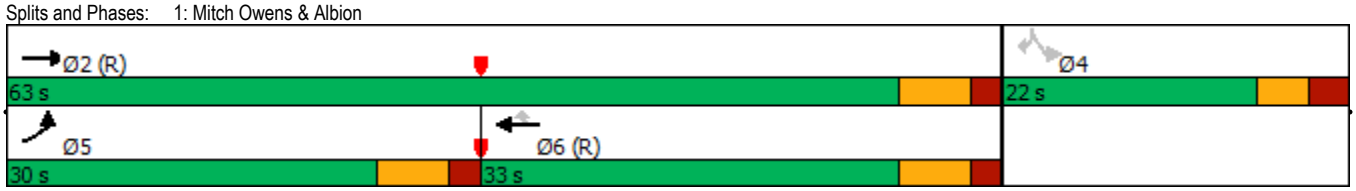


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	377	341	495	344	117	120
Future Volume (vph)	377	341	495	344	117	120
Satd. Flow (prot)	1647	1685	1596	1419	1453	1218
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1647	1685	1596	1419	1453	1218
Satd. Flow (RTOR)				382		133
Lane Group Flow (vph)	419	379	550	382	130	133
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.6	16.6	25.6	25.6	22.0	22.0
Total Split (s)	30.0	63.0	33.0	33.0	22.0	22.0
Total Split (%)	35.3%	74.1%	38.8%	38.8%	25.9%	25.9%
Yellow Time (s)	4.6	4.6	4.6	4.6	3.3	3.3
All-Red Time (s)	2.0	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	24.4	59.5	28.5	28.5	12.9	12.9
Actuated g/C Ratio	0.29	0.70	0.34	0.34	0.15	0.15
v/c Ratio	0.89	0.32	1.03	0.52	0.59	0.45
Control Delay	51.9	6.2	78.0	5.5	44.6	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.9	6.2	78.0	5.5	44.6	11.0
LOS	D	A	E	A	D	B
Approach Delay		30.2	48.3		27.6	
Approach LOS		C	D		C	
Queue Length 50th (m)	62.2	20.1	~103.4	0.0	19.9	0.0
Queue Length 95th (m)	#118.9	36.7	#161.9	19.0	35.8	14.0
Internal Link Dist (m)		564.5	1353.6		69.0	
Turn Bay Length (m)	255.0			150.0	150.0	
Base Capacity (vph)	480	1179	535	729	273	337
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.32	1.03	0.52	0.48	0.39

Intersection Summary	
Cycle Length: 85	
Actuated Cycle Length: 85	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.03	
Intersection Signal Delay: 38.3	Intersection LOS: D
Intersection Capacity Utilization 73.9%	ICU Level of Service D
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Mitch Owens & Albion



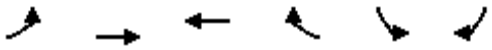
Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	47	11	721	237	42
Future Vol, veh/h	30	47	11	721	237	42
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	-	-	55
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	52	12	801	263	47

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1112	155	310	0	-	0
Stage 1	287	-	-	-	-	-
Stage 2	825	-	-	-	-	-
Critical Hdwy	6.63	6.93	4.13	-	-	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	216	864	1249	-	-	-
Stage 1	737	-	-	-	-	-
Stage 2	429	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	212	864	1249	-	-	-
Mov Cap-2 Maneuver	212	-	-	-	-	-
Stage 1	724	-	-	-	-	-
Stage 2	429	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.5	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1249	-	212	864	-	-
HCM Lane V/C Ratio	0.01	-	0.157	0.06	-	-
HCM Control Delay (s)	7.9	0	25.1	9.4	-	-
HCM Lane LOS	A	A	D	A	-	-
HCM 95th %tile Q(veh)	0	-	0.5	0.2	-	-



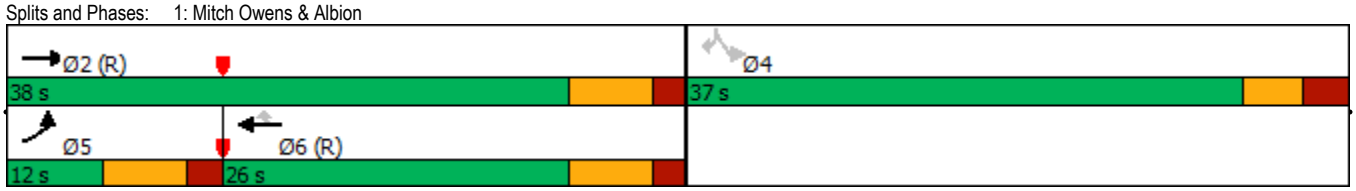
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	221	498	202	412	348	460
Future Volume (vph)	221	498	202	412	348	460
Satd. Flow (prot)	1544	1640	1685	1419	1491	1381
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1544	1640	1685	1419	1491	1350
Satd. Flow (RTOR)				458		511
Lane Group Flow (vph)	246	553	224	458	387	511
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.6	16.6	25.6	25.6	22.0	22.0
Total Split (s)	12.0	38.0	26.0	26.0	37.0	37.0
Total Split (%)	16.0%	50.7%	34.7%	34.7%	49.3%	49.3%
Yellow Time (s)	4.6	4.6	4.6	4.6	3.3	3.3
All-Red Time (s)	2.0	2.0	2.0	2.0	2.7	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Act Effct Green (s)	11.7	37.7	19.4	19.4	24.7	24.7
Actuated g/C Ratio	0.16	0.50	0.26	0.26	0.33	0.33
v/c Ratio	1.02	0.67	0.51	0.65	0.79	0.65
Control Delay	104.5	21.5	28.8	7.5	34.2	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.5	21.5	28.8	7.5	34.2	6.0
LOS	F	C	C	A	C	A
Approach Delay		47.0	14.5		18.1	
Approach LOS		D	B		B	
Queue Length 50th (m)	~40.5	56.8	27.1	0.0	47.9	0.0
Queue Length 95th (m)	#98.2	#118.7	47.2	22.5	70.0	16.8
Internal Link Dist (m)		564.5	1353.6		69.0	
Turn Bay Length (m)	255.0			150.0	150.0	
Base Capacity (vph)	240	824	435	706	616	857
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.67	0.51	0.65	0.63	0.60

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 25 (33%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 26.8	Intersection LOS: C
Intersection Capacity Utilization 60.5%	ICU Level of Service B
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Mitch Owens & Albion



Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	37	11	10	633	808	77
Future Vol, veh/h	37	11	10	633	808	77
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	-	-	55
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	12	11	703	898	86

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1666	492	984	0	-	0
Stage 1	941	-	-	-	-	-
Stage 2	725	-	-	-	-	-
Critical Hdwy	6.63	6.93	4.13	-	-	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	2.219	-	-	-
Pot Cap-1 Maneuver	96	523	700	-	-	-
Stage 1	341	-	-	-	-	-
Stage 2	478	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	94	523	700	-	-	-
Mov Cap-2 Maneuver	94	-	-	-	-	-
Stage 1	332	-	-	-	-	-
Stage 2	478	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	56.9	0.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	700	-	94	523	-	-
HCM Lane V/C Ratio	0.016	-	0.437	0.023	-	-
HCM Control Delay (s)	10.2	0	70.2	12	-	-
HCM Lane LOS	B	A	F	B	-	-
HCM 95th %tile Q(veh)	0	-	1.8	0.1	-	-

APPENDIX E

Synchro Report: Background 2030 Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	376	383	5	7	528	362	5	25	9	152	10	118
Future Volume (vph)	376	383	5	7	528	362	5	25	9	152	10	118
Satd. Flow (prot)	1647	1683	0	1695	1596	1419	0	1770	1517	0	1474	1218
Flt Permitted	0.950			0.950				0.943			0.717	
Satd. Flow (perm)	1647	1683	0	1695	1596	1419	0	1683	1517	0	1106	1218
Satd. Flow (RTOR)		1				362			208			208
Lane Group Flow (vph)	376	388	0	7	528	362	0	30	9	0	162	118
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.6	25.6		11.0	25.6	25.6	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	27.1	52.0		11.0	35.9	35.9	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (%)	31.9%	61.2%		12.9%	42.2%	42.2%	25.9%	25.9%	25.9%	25.9%	25.9%	25.9%
Yellow Time (s)	4.6	4.6		4.0	4.6	4.6	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.7	2.7	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	6.6	6.6		6.0	6.6	6.6		6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	20.5	55.2		5.2	30.3	30.3		15.0	15.0		15.0	15.0
Actuated g/C Ratio	0.24	0.65		0.06	0.36	0.36		0.18	0.18		0.18	0.18
v/c Ratio	0.94	0.35		0.07	0.93	0.49		0.10	0.02		0.84	0.31
Control Delay	67.2	9.0		39.4	52.6	4.9		29.6	0.1		67.9	2.1
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	67.2	9.0		39.4	52.6	4.9		29.6	0.1		67.9	2.1
LOS	E	A		D	D	A		C	A		E	A
Approach Delay		37.7			33.2			22.8			40.2	
Approach LOS		D			C			C			D	
Queue Length 50th (m)	60.1	24.0		1.1	82.9	0.0		4.1	0.0		25.3	0.0
Queue Length 95th (m)	#112.0	56.2		5.1	#144.4	17.2		11.2	0.0		#56.1	0.4
Internal Link Dist (m)		564.5			120.4			126.2			64.8	
Turn Bay Length (m)	255.0			90.0		150.0			30.0			
Base Capacity (vph)	398	1094		102	569	738		316	454		208	398
Starvation Cap Reductn	0	0		0	0	0		0	0		0	0
Spillback Cap Reductn	0	0		0	0	0		0	0		0	0
Storage Cap Reductn	0	0		0	0	0		0	0		0	0
Reduced v/c Ratio	0.94	0.35		0.07	0.93	0.49		0.09	0.02		0.78	0.30

Intersection Summary	
Cycle Length: 85	
Actuated Cycle Length: 85	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 35.7	Intersection LOS: D
Intersection Capacity Utilization 83.4%	ICU Level of Service E
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 2: Mitch Owens & Albion

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	64	0	27	0	0	0	14	754	0	0	272	59
Future Vol, veh/h	64	0	27	0	0	0	14	754	0	0	272	59
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	20	-	-	-	55	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	100	2	100	2	2	100	100	2	2
Mvmt Flow	64	0	27	0	0	0	14	754	0	0	272	59

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1084	1084	166	918	1113	754	331	0	0	754	0	0
Stage 1	302	302	-	782	782	-	-	-	-	-	-	-
Stage 2	782	782	-	136	331	-	-	-	-	-	-	-
Critical Hdwy	7.33	6.53	6.93	8.8	6.53	7.7	4.13	-	-	5.6	-	-
Critical Hdwy Stg 1	6.53	5.53	-	7.6	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	8	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.519	4.019	3.319	4.45	4.019	4.25	2.219	-	-	3.15	-	-
Pot Cap-1 Maneuver	183	216	850	143	208	255	1227	-	-	483	-	-
Stage 1	683	664	-	242	404	-	-	-	-	-	-	-
Stage 2	386	404	-	650	644	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	180	212	850	136	204	255	1227	-	-	483	-	-
Mov Cap-2 Maneuver	180	212	-	136	204	-	-	-	-	-	-	-
Stage 1	669	664	-	237	396	-	-	-	-	-	-	-
Stage 2	378	396	-	629	644	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	27.8	0	0.1	0
HCM LOS	D	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1227	-	-	180	850	-	-	483	-	-
HCM Lane V/C Ratio	0.011	-	-	0.356	0.032	-	-	-	-	-
HCM Control Delay (s)	8	0	-	35.6	9.4	0	0	0	-	-
HCM Lane LOS	A	A	-	E	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.5	0.1	-	-	0	-	-

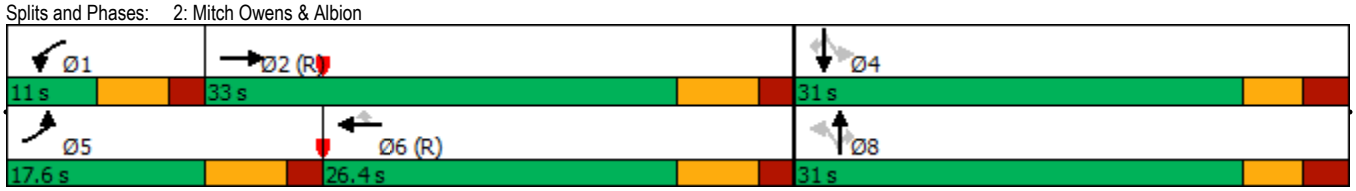
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	214	529	5	9	251	445	5	15	8	385	25	457
Future Volume (vph)	214	529	5	9	251	445	5	15	8	385	25	457
Satd. Flow (prot)	1544	1639	0	1695	1685	1419	0	1763	1517	0	1509	1381
Flt Permitted	0.950			0.950				0.908			0.725	
Satd. Flow (perm)	1544	1639	0	1695	1685	1419	0	1620	1517	0	1146	1350
Satd. Flow (RTOR)		1				445			140			457
Lane Group Flow (vph)	214	534	0	9	251	445	0	20	8	0	410	457
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.6	25.6		11.0	25.6	25.6	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	17.6	33.0		11.0	26.4	26.4	31.0	31.0	31.0	31.0	31.0	31.0
Total Split (%)	23.5%	44.0%		14.7%	35.2%	35.2%	41.3%	41.3%	41.3%	41.3%	41.3%	41.3%
Yellow Time (s)	4.6	4.6		4.0	4.6	4.6	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.7	2.7	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	6.6	6.6		6.0	6.6	6.6		6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	11.0	35.2		5.0	19.8	19.8		25.0	25.0		25.0	25.0
Actuated g/C Ratio	0.15	0.47		0.07	0.26	0.26		0.33	0.33		0.33	0.33
v/c Ratio	0.95	0.69		0.08	0.57	0.63		0.04	0.01		1.07	0.61
Control Delay	83.1	23.9		34.6	29.7	7.2		17.2	0.0		95.0	6.0
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	83.1	23.9		34.6	29.7	7.2		17.2	0.0		95.0	6.0
LOS	F	C		C	C	A		B	A		F	A
Approach Delay		40.8			15.6			12.3			48.1	
Approach LOS		D			B			B			D	
Queue Length 50th (m)	30.4	52.7		1.2	30.7	0.0		1.9	0.0		~65.7	0.0
Queue Length 95th (m)	#68.9	#129.5		5.4	52.5	21.8		6.2	0.0		#115.8	19.6
Internal Link Dist (m)		564.5			120.4			126.2			64.8	
Turn Bay Length (m)	255.0			90.0		150.0			30.0			
Base Capacity (vph)	226	769		113	444	702		540	599		382	754
Starvation Cap Reductn	0	0		0	0	0		0	0		0	0
Spillback Cap Reductn	0	0		0	0	0		0	0		0	0
Storage Cap Reductn	0	0		0	0	0		0	0		0	0
Reduced v/c Ratio	0.95	0.69		0.08	0.57	0.63		0.04	0.01		1.07	0.61

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.07	
Intersection Signal Delay: 35.6	Intersection LOS: D
Intersection Capacity Utilization 79.9%	ICU Level of Service D
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Mitch Owens & Albion



Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	46	0	59	0	0	0	16	676	0	0	852	106
Future Vol, veh/h	46	0	59	0	0	0	16	676	0	0	852	106
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	20	-	-	-	55	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	100	2	100	2	2	100	100	2	2
Mvmt Flow	46	0	59	0	0	0	16	676	0	0	852	106

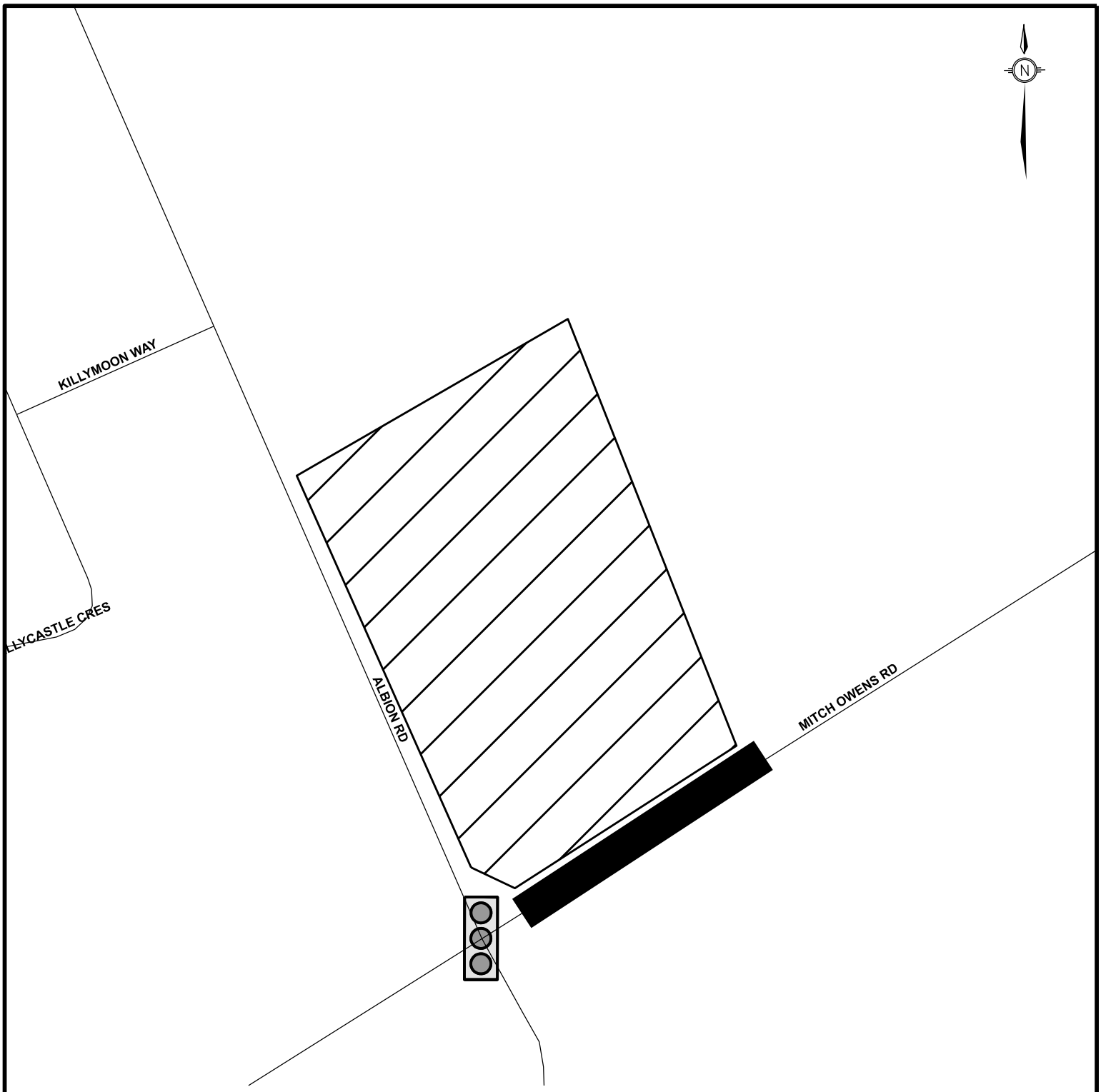
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1613	1613	479	1134	1666	676	958	0	0	676	0	0
Stage 1	905	905	-	708	708	-	-	-	-	-	-	-
Stage 2	708	708	-	426	958	-	-	-	-	-	-	-
Critical Hdwy	7.33	6.53	6.93	8.8	6.53	7.7	4.13	-	-	5.6	-	-
Critical Hdwy Stg 1	6.53	5.53	-	7.6	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	8	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.519	4.019	3.319	4.45	4.019	4.25	2.219	-	-	3.15	-	-
Pot Cap-1 Maneuver	76	104	534	94	96	290	716	-	-	529	-	-
Stage 1	299	354	-	272	437	-	-	-	-	-	-	-
Stage 2	425	437	-	404	335	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	74	100	534	81	93	290	716	-	-	529	-	-
Mov Cap-2 Maneuver	74	100	-	81	93	-	-	-	-	-	-	-
Stage 1	288	354	-	262	421	-	-	-	-	-	-	-
Stage 2	410	421	-	359	335	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	56.5	0	0.2	0
HCM LOS	F	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	716	-	-	74	534	-	-	529	-	-
HCM Lane V/C Ratio	0.022	-	-	0.622	0.11	-	-	-	-	-
HCM Control Delay (s)	10.1	0	-	112.9	12.6	0	0	0	-	-
HCM Lane LOS	B	A	-	F	B	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2.8	0.4	-	-	0	-	-

APPENDIX F

RMA - Westbound Left-Turn Mitch Owens



LEGEND:

- EXISITING TRAFFIC SIGNALS
- AREA OF PROPOSED ROADWAY MODIFICATION
- PROPOSED DEVELOPMENT

TRANSPORTATION SERVICES DEPARTMENT

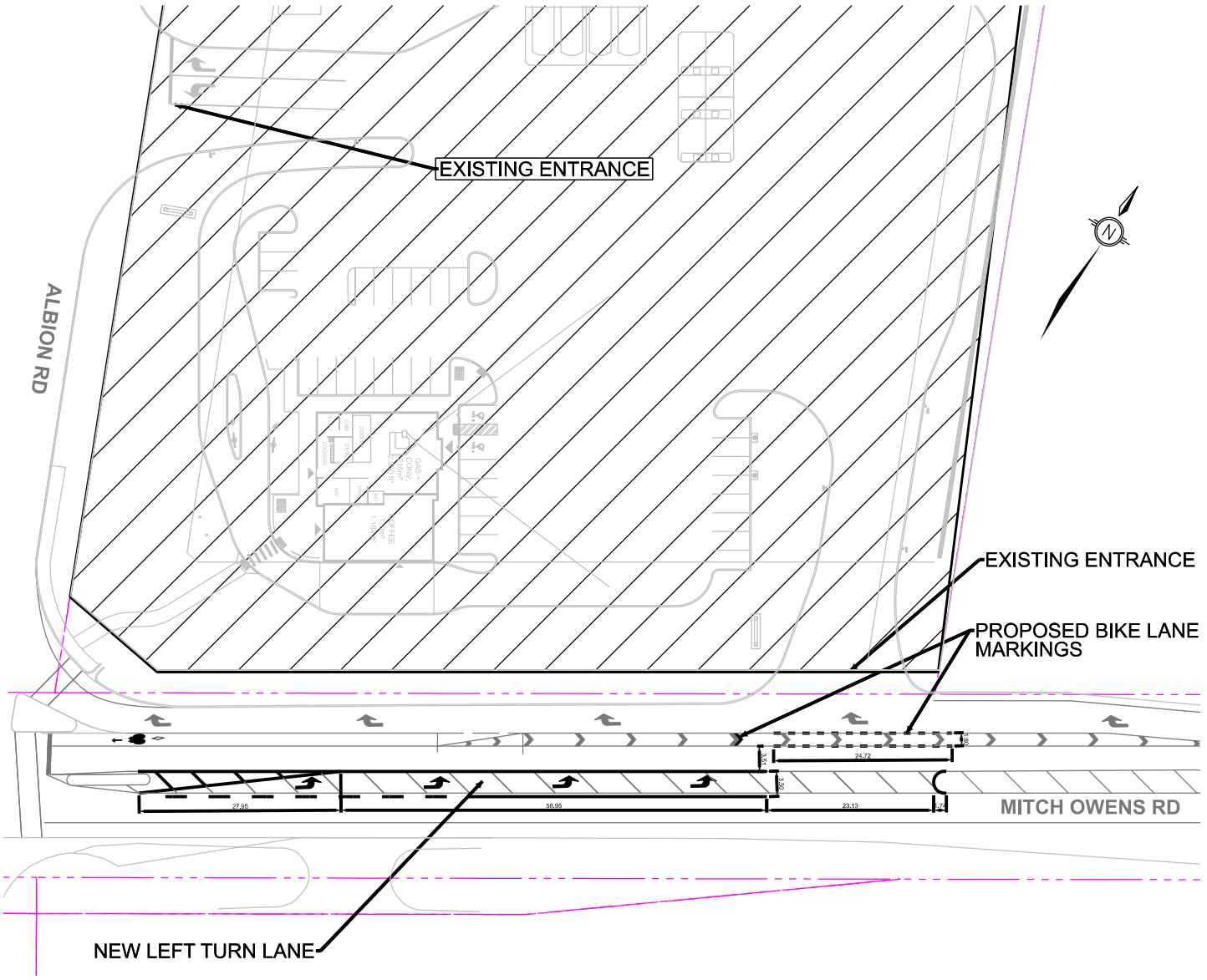
KEY PLAN

5545 ALBION ROAD

OTTAWA, ON

Transportation Engineering Services Branch

Approved By: ...	Drawing No.: RMA-2025-TPD-XXX-B
Completed By: PARSONS	
Scale: N.T.S.	Date: MAY. 2025



LEGEND:

PROPOSED DEVELOPMENT

TRANSPORTATION SERVICES DEPARTMENT

PROPOSED ROADWAY MODIFICATIONS

5545 ALBION ROAD

OTTAWA, ON

Transportation Engineering Services Branch

Approved By: ...	Drawing No.: RMA-2025-TPD-XXX-B
Completed By: PARSONS	
Scale: 1:3.5	Date: MAY. 2025

5545 ALBION ROAD
LEFT TURN LANE - MITCH OWENS

EXISTING PAVEMENT MARKINGS AND SIGNAGE 01
MITCH OWENS ROAD

Project Manager

PARSONS

Ottawa

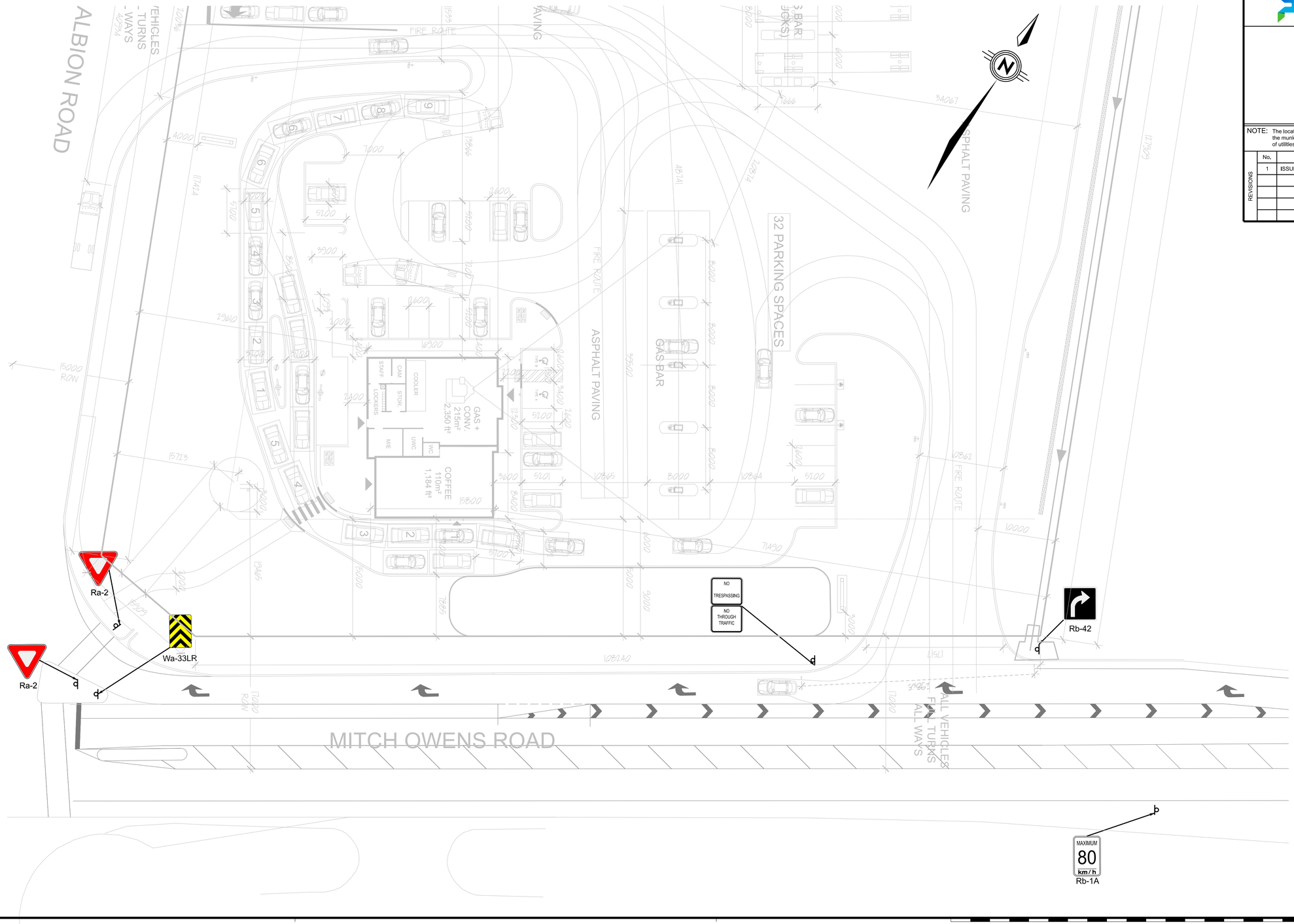
Contract No.	Dwg. No. 01
Sheet 1 of _	
Asset No.	
Asset Group	
Des. SA	Chk'd. WR
Dwn. SA	Chk'd. WR
Utility Circ. No.	Index No.
Const. Inspector	

Scale: HORIZONTAL
0m 2.5 5 10

NOTE: The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned, The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

REVISIONS

No.	Description	By	Date (dd/mm/yy)
1	ISSUED FOR 33% REVIEW	W.R.	30/05/24



TITLE FRAME: 863.6mm x 558.8mm City of Ottawa 2008

Plot Date: $DATE$

Last Saved: 5/29/2025 1:05:07 PM

Consultant's Information: $FILEPATH$

5545 ALBION ROAD

LEFT TURN LANE - MITCH OWENS

PROPOSED PAVEMENT MARKINGS AND SIGNAGE 01
MITCH OWENS ROAD

Project Manager

PARSONS

Ottawa

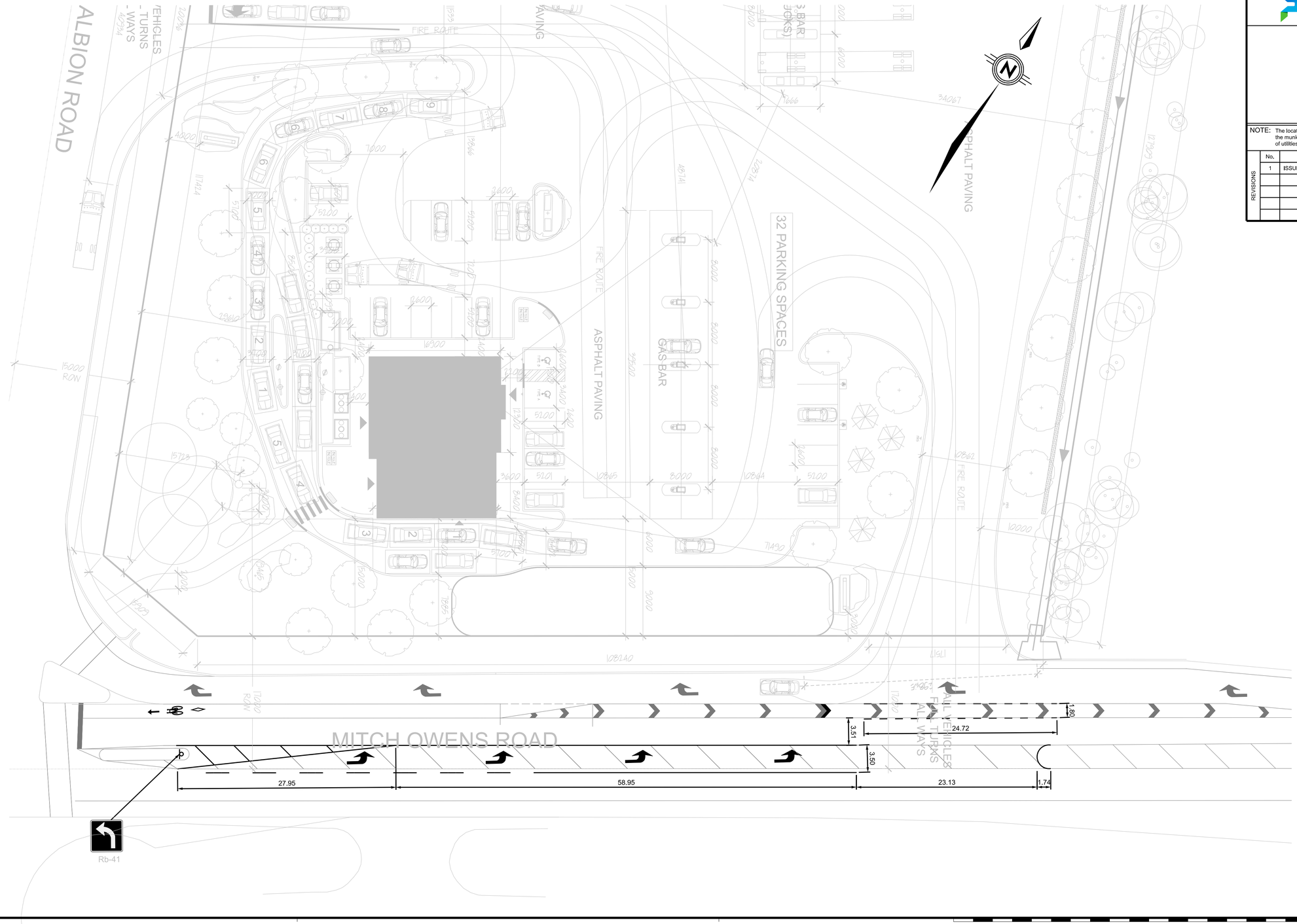
Contract No.	Dwg. No. 02
Sheet 2 of _	
Asset No.	
Asset Group	
Des. SA	Chk'd. WR
Dwn. SA	Chk'd. WR
Utility Circ. No.	Index No.
Const. Inspector	

Scale: HORIZONTAL
0m 2.5 5 10

NOTE: The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned, The contractor shall prove the location of utilities and shall be responsible for adequate protection from damage.

REVISIONS

No.	Description	By	Date (dd/mm/yy)
1	ISSUED FOR 33% REVIEW	W.R.	30/05/2025



PARSONS

Project Name: 5545 Albion Road - Left Turn Lane Mitch Owens
Address 5545 Albion Road
Location: Mitch Owens Road
Subject: RMA Class 'D' Cost Estimate
Date: 9/5/2025
Job #: 477176

	DESCRIPTION		COST
	5545 Albion Road		
1.1	GENERAL	$	7,231.00
1.2	REMOVALS	$	7,500.00
1.3	NEW CONSTRUCTION	$	14,700.00
Subtotal (Construction)		*$*	*29,431.00*

Engineering and Architectural Services	25%	$	7,357.75
Utilities	0%	$	-
Property	0%	$	-
City Internal Costs	7%	$	2,060.17
Miscellaneous (Permits, applications, Comm's etc.)	5%	$	1,471.55
Subtotal (Soft Cost)		*$*	*10,889.47*

Subtotal (Construction + Soft Costs)		*$*	*40,320.47*
Contingency	40%	$	16,128.19
Subtotal (Construction + Soft Costs + Contingency)		$	56,448.66
Total Estimated Cost (Excluding HST)		$	56,448.66
Total Estimated Cost (Rounded)		**$**	**56,500.00**

Exclusions and Assumptions:

1 Estimate based on RMA.
2 Unit Rates are based on City Spec Code (June 3, 2025) or engineering judgement.
3 Costs captured are limited to works within the City of Ottawa ROW and do not include on-site work.
4 No storm or sanitary sewer servicing has been included.
5 Assumes no traffic signal or streetlighting modifications required.
6 Unit prices assumes all off-site work is done concurrent/consecutively as one Contract.
7 Costs are in 2025 dollars and exclude HST.
8 New construction is limited to pavement marking and signage.

APPENDIX G

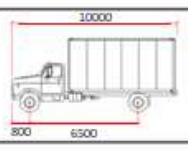
Vehicle Turning Templates

PARSONS

Note: The location of utilities is approximate only, the exact location should be determined by consulting the municipal authorities and utility companies concerned. The contractor shall provide the location of utilities and shall be responsible for adequate protection from damage.

N

Legend



MSU

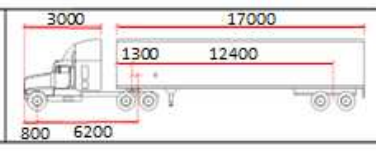
	mm
Width	: 2600
Track	: 2600
Lock to Lock Time	: 6.0
Steering Angle	: 40.2

Not to Scale

Drawing Description	Site Circulation	
Client	Stinsons Gas	Date 2024-11-14 / Figure Number 1/1
Project Number	477176	Project Description 5545 Albion Rd

PARSONS

N



WB-20 Not to Scale

	mm
Width	: 2600
Track	: 2600
Lock to Lock Time	: 6.0
Steering Angle	: 28.2

Drawing Description		
Client	Date	Figure Number
Project Number	Project Description	

ME2

RH1

RC2

1350m²
RESERVED
FOR SEPTIC
SYSTEM

FUTURE POSSIBLE
DRIVEWAY CONNECTION

ASPHALT PAVING

CARD LOCK

41 PARKING SPACES

UNDERGROUND FUEL STORAGE

GAS BAR

FUTURE EV
CHARGING
LOCATION

PYLON SIGN

RETAINING WALL -
REFER TO GRADING

ROOF WATER
INFILTRATION
SWALE - 274m²

CENTRE LINE
OF ROW

GAS +
CONV.
213m²
2,300 sf

COFFEE
120m²
1,220 sf

WALK-IN

PATIO

STORMWATER
MANAGEMENT
SWALE - 350m²

LOCATION OF
NEW WELL

NEW SIDEWALK

EXISTING SIDEWALK

ALL VEHICLES
FULL TURNS
ALL WAYS

APPENDIX H

Synchro Report: Future 2030 Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	378	388	5	7	533	332	5	25	9	148	10	120
Future Volume (vph)	378	388	5	7	533	332	5	25	9	148	10	120
Satd. Flow (prot)	1647	1683	0	1695	1596	1419	0	1770	1517	0	1474	1218
Flt Permitted	0.950			0.950				0.943			0.718	
Satd. Flow (perm)	1647	1683	0	1695	1596	1419	0	1683	1517	0	1108	1218
Satd. Flow (RTOR)		1				332			208			208
Lane Group Flow (vph)	378	393	0	7	533	332	0	30	9	0	158	120
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.6	25.6		11.0	25.6	25.6	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	27.2	52.0		11.0	35.8	35.8	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (%)	32.0%	61.2%		12.9%	42.1%	42.1%	25.9%	25.9%	25.9%	25.9%	25.9%	25.9%
Yellow Time (s)	4.6	4.6		4.0	4.6	4.6	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.7	2.7	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	6.6	6.6		6.0	6.6	6.6		6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	20.7	55.4		5.2	30.3	30.3		14.8	14.8		14.8	14.8
Actuated g/C Ratio	0.24	0.65		0.06	0.36	0.36		0.17	0.17		0.17	0.17
v/c Ratio	0.94	0.36		0.07	0.94	0.46		0.10	0.02		0.82	0.31
Control Delay	66.2	9.0		39.4	54.2	4.8		29.7	0.1		66.7	2.3
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	66.2	9.0		39.4	54.2	4.8		29.7	0.1		66.7	2.3
LOS	E	A		D	D	A		C	A		E	A
Approach Delay		37.0			35.3			22.9			38.9	
Approach LOS		D			D			C			D	
Queue Length 50th (m)	60.5	24.4		1.1	84.1	0.0		4.1	0.0		24.5	0.0
Queue Length 95th (m)	#112.1	57.2		5.1	#146.4	16.6		11.2	0.0		#54.7	0.7
Internal Link Dist (m)		564.5			120.4			126.2			64.8	
Turn Bay Length (m)	255.0			90.0		150.0			30.0			
Base Capacity (vph)	402	1098		103	569	719		316	454		208	398
Starvation Cap Reductn	0	0		0	0	0		0	0		0	0
Spillback Cap Reductn	0	0		0	0	0		0	0		0	0
Storage Cap Reductn	0	0		0	0	0		0	0		0	0
Reduced v/c Ratio	0.94	0.36		0.07	0.94	0.46		0.09	0.02		0.76	0.30

Intersection Summary	
Cycle Length: 85	
Actuated Cycle Length: 85	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 36.2	Intersection LOS: D
Intersection Capacity Utilization 83.6%	ICU Level of Service E
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 2: Mitch Owens & Albion

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	378	388	5	7	533	332	5	25	9	148	10	120
Future Volume (vph)	378	388	5	7	533	332	5	25	9	148	10	120
Satd. Flow (prot)	1647	1683	0	1695	1596	1419	0	1770	1517	0	1474	1218
Flt Permitted	0.950			0.950				0.943			0.718	
Satd. Flow (perm)	1647	1683	0	1695	1596	1419	0	1683	1517	0	1108	1218
Satd. Flow (RTOR)		1				332			196			196
Lane Group Flow (vph)	378	393	0	7	533	332	0	30	9	0	158	120
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.6	25.6		11.0	25.6	25.6	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	29.0	57.0		11.0	39.0	39.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (%)	32.2%	63.3%		12.2%	43.3%	43.3%	24.4%	24.4%	24.4%	24.4%	24.4%	24.4%
Yellow Time (s)	4.6	4.6		4.0	4.6	4.6	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.7	2.7	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	6.6	6.6		6.0	6.6	6.6		6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	22.1	60.1		5.1	33.6	33.6		15.1	15.1		15.1	15.1
Actuated g/C Ratio	0.25	0.67		0.06	0.37	0.37		0.17	0.17		0.17	0.17
v/c Ratio	0.94	0.35		0.07	0.90	0.45		0.11	0.02		0.85	0.33
Control Delay	66.8	8.5		42.1	47.5	4.6		32.2	0.1		74.2	3.0
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	66.8	8.5		42.1	47.5	4.6		32.2	0.1		74.2	3.0
LOS	E	A		D	D	A		C	A		E	A
Approach Delay		37.1			31.1			24.8			43.5	
Approach LOS		D			C			C			D	
Queue Length 50th (m)	63.8	24.4		1.2	87.1	0.0		4.4	0.0		26.5	0.0
Queue Length 95th (m)	#115.2	56.2		5.4	#148.5	16.7		11.7	0.0		#58.7	2.2
Internal Link Dist (m)		564.5			120.4			126.2			64.8	
Turn Bay Length (m)	255.0			90.0		150.0			30.0			
Base Capacity (vph)	409	1123		96	595	737		299	430		196	377
Starvation Cap Reductn	0	0		0	0	0		0	0		0	0
Spillback Cap Reductn	0	0		0	0	0		0	0		0	0
Storage Cap Reductn	0	0		0	0	0		0	0		0	0
Reduced v/c Ratio	0.92	0.35		0.07	0.90	0.45		0.10	0.02		0.81	0.32

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay: 35.1	Intersection LOS: D
Intersection Capacity Utilization 83.6%	ICU Level of Service E
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 2: Mitch Owens & Albion

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	64	0	27	9	0	43	14	743	13	17	261	59
Future Vol, veh/h	64	0	27	9	0	43	14	743	13	17	261	59
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	20	-	-	-	55	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	100	2	100	2	2	100	100	2	2
Mvmt Flow	64	0	27	9	0	43	14	743	13	17	261	59

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1124	1109	160	943	1132	750	320	0	0	756	0	0
Stage 1	325	325	-	778	778	-	-	-	-	-	-	-
Stage 2	799	784	-	165	354	-	-	-	-	-	-	-
Critical Hdwy	7.33	6.53	6.93	8.8	6.53	7.7	4.13	-	-	5.6	-	-
Critical Hdwy Stg 1	6.53	5.53	-	7.6	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	8	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.519	4.019	3.319	4.45	4.019	4.25	2.219	-	-	3.15	-	-
Pot Cap-1 Maneuver	171	209	857	137	202	257	1238	-	-	482	-	-
Stage 1	662	648	-	244	406	-	-	-	-	-	-	-
Stage 2	378	403	-	620	630	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	136	196	857	126	189	257	1238	-	-	482	-	-
Mov Cap-2 Maneuver	136	196	-	126	189	-	-	-	-	-	-	-
Stage 1	649	620	-	239	398	-	-	-	-	-	-	-
Stage 2	308	395	-	575	603	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	40	24.2	0.1	0.8
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1238	-	-	136	857	126	257	482	-	-
HCM Lane V/C Ratio	0.011	-	-	0.471	0.032	0.071	0.167	0.035	-	-
HCM Control Delay (s)	7.9	0	-	53	9.3	35.8	21.8	12.7	0.2	-
HCM Lane LOS	A	A	-	F	A	E	C	B	A	-
HCM 95th %tile Q(veh)	0	-	-	2.2	0.1	0.2	0.6	0.1	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	12	537	852	51	20	20
Future Vol, veh/h	12	537	852	51	20	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	15	-	-	70	20	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	537	852	51	20	20

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	903	0	-	0	1439	452
Stage 1	-	-	-	-	878	-
Stage 2	-	-	-	-	561	-
Critical Hdwy	4.13	-	-	-	6.63	6.93
Critical Hdwy Stg 1	-	-	-	-	5.83	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.219	-	-	-	3.519	3.319
Pot Cap-1 Maneuver	751	-	-	-	135	556
Stage 1	-	-	-	-	368	-
Stage 2	-	-	-	-	570	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	751	-	-	-	133	556
Mov Cap-2 Maneuver	-	-	-	-	133	-
Stage 1	-	-	-	-	362	-
Stage 2	-	-	-	-	570	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	24.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	751	-	-	-	133	556
HCM Lane V/C Ratio	0.016	-	-	-	0.15	0.036
HCM Control Delay (s)	9.9	-	-	-	36.8	11.7
HCM Lane LOS	A	-	-	-	E	B
HCM 95th %tile Q(veh)	0	-	-	-	0.5	0.1

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	35	0	27	9	0	72	14	743	42	17	261	59
Future Vol, veh/h	35	0	27	9	0	72	14	743	42	17	261	59
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	20	-	-	-	55	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	100	2	100	2	2	100	100	2	2
Mvmt Flow	35	0	27	9	0	72	14	743	42	17	261	59

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1153	1138	160	957	1146	764	320	0	0	785	0	0
Stage 1	325	325	-	792	792	-	-	-	-	-	-	-
Stage 2	828	813	-	165	354	-	-	-	-	-	-	-
Critical Hdwy	7.33	6.53	6.93	8.8	6.53	7.7	4.13	-	-	5.6	-	-
Critical Hdwy Stg 1	6.53	5.53	-	7.6	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	8	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.519	4.019	3.319	4.45	4.019	4.25	2.219	-	-	3.15	-	-
Pot Cap-1 Maneuver	163	201	857	133	199	251	1238	-	-	466	-	-
Stage 1	662	648	-	238	400	-	-	-	-	-	-	-
Stage 2	364	391	-	620	630	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	111	188	857	122	186	251	1238	-	-	466	-	-
Mov Cap-2 Maneuver	111	188	-	122	186	-	-	-	-	-	-	-
Stage 1	649	619	-	233	392	-	-	-	-	-	-	-
Stage 2	254	383	-	573	602	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	33.2	26.3	0.1	0.9
HCM LOS	D	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1238	-	-	111	857	122	251	466	-	-
HCM Lane V/C Ratio	0.011	-	-	0.315	0.032	0.074	0.287	0.036	-	-
HCM Control Delay (s)	7.9	0	-	51.7	9.3	36.8	25	13	0.3	-
HCM Lane LOS	A	A	-	F	A	E	D	B	A	-
HCM 95th %tile Q(veh)	0	-	-	1.2	0.1	0.2	1.1	0.1	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	215	533	5	9	255	428	5	15	8	382	25	458
Future Volume (vph)	215	533	5	9	255	428	5	15	8	382	25	458
Satd. Flow (prot)	1544	1639	0	1695	1685	1419	0	1763	1517	0	1510	1381
Flt Permitted	0.950			0.950				0.908			0.725	
Satd. Flow (perm)	1544	1639	0	1695	1685	1419	0	1620	1517	0	1146	1350
Satd. Flow (RTOR)		1				428			140			458
Lane Group Flow (vph)	215	538	0	9	255	428	0	20	8	0	407	458
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.6	25.6		11.0	25.6	25.6	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	17.6	33.0		11.0	26.4	26.4	31.0	31.0	31.0	31.0	31.0	31.0
Total Split (%)	23.5%	44.0%		14.7%	35.2%	35.2%	41.3%	41.3%	41.3%	41.3%	41.3%	41.3%
Yellow Time (s)	4.6	4.6		4.0	4.6	4.6	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.7	2.7	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	6.6	6.6		6.0	6.6	6.6		6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	11.0	35.2		5.0	19.8	19.8		25.0	25.0		25.0	25.0
Actuated g/C Ratio	0.15	0.47		0.07	0.26	0.26		0.33	0.33		0.33	0.33
v/c Ratio	0.95	0.70		0.08	0.57	0.62		0.04	0.01		1.07	0.61
Control Delay	84.1	24.1		34.6	30.0	7.1		17.2	0.0		92.6	6.0
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	84.1	24.1		34.6	30.0	7.1		17.2	0.0		92.6	6.0
LOS	F	C		C	C	A		B	A		F	A
Approach Delay		41.2			15.9			12.3			46.7	
Approach LOS		D			B			B			D	
Queue Length 50th (m)	30.6	53.4		1.2	31.2	0.0		1.9	0.0		~64.8	0.0
Queue Length 95th (m)	#69.2	#131.1		5.4	53.2	21.3		6.2	0.0		#114.6	19.6
Internal Link Dist (m)		564.5			120.4			126.2			64.8	
Turn Bay Length (m)	255.0			90.0		150.0			30.0			
Base Capacity (vph)	226	769		113	444	689		540	599		382	755
Starvation Cap Reductn	0	0		0	0	0		0	0		0	0
Spillback Cap Reductn	0	0		0	0	0		0	0		0	0
Storage Cap Reductn	0	0		0	0	0		0	0		0	0
Reduced v/c Ratio	0.95	0.70		0.08	0.57	0.62		0.04	0.01		1.07	0.61

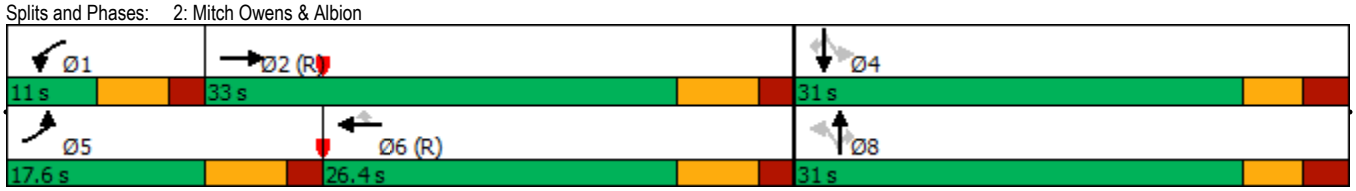
Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.07
Intersection Signal Delay: 35.4 Intersection LOS: D
Intersection Capacity Utilization 80.0% ICU Level of Service D
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Mitch Owens & Albion

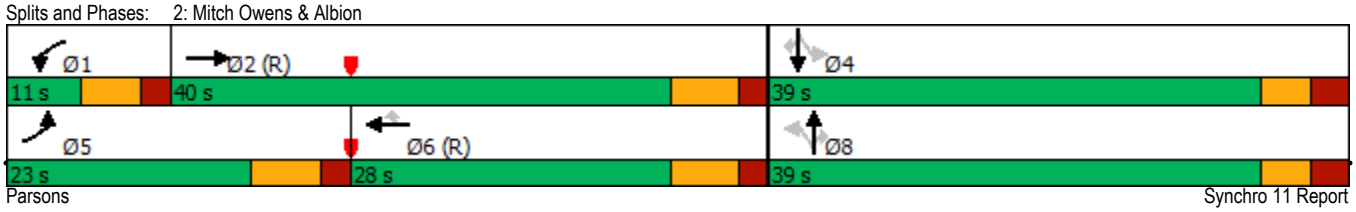


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	215	533	5	9	255	428	5	15	8	382	25	458
Future Volume (vph)	215	533	5	9	255	428	5	15	8	382	25	458
Satd. Flow (prot)	1544	1639	0	1695	1685	1419	0	1763	1517	0	1510	1381
Flt Permitted	0.950			0.950				0.916			0.725	
Satd. Flow (perm)	1544	1639	0	1695	1685	1419	0	1634	1517	0	1146	1350
Satd. Flow (RTOR)		1				428			196			458
Lane Group Flow (vph)	215	538	0	9	255	428	0	20	8	0	407	458
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		4
Detector Phase	5	2		1	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	5.0	10.0		5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.6	25.6		11.0	25.6	25.6	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	23.0	40.0		11.0	28.0	28.0	39.0	39.0	39.0	39.0	39.0	39.0
Total Split (%)	25.6%	44.4%		12.2%	31.1%	31.1%	43.3%	43.3%	43.3%	43.3%	43.3%	43.3%
Yellow Time (s)	4.6	4.6		4.0	4.6	4.6	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.7	2.7	2.7	2.7	2.7	2.7
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	6.6	6.6		6.0	6.6	6.6		6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	15.3	42.3		5.1	22.6	22.6		32.9	32.9		32.9	32.9
Actuated g/C Ratio	0.17	0.47		0.06	0.25	0.25		0.37	0.37		0.37	0.37
v/c Ratio	0.82	0.70		0.09	0.60	0.63		0.03	0.01		0.97	0.58
Control Delay	61.2	26.5		42.7	37.4	7.9		18.6	0.0		67.7	5.5
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	61.2	26.5		42.7	37.4	7.9		18.6	0.0		67.7	5.5
LOS	E	C		D	D	A		B	A		E	A
Approach Delay		36.4			19.2			13.3			34.8	
Approach LOS		D			B			B			C	
Queue Length 50th (m)	35.7	66.9		1.5	39.7	0.0		2.2	0.0		67.9	0.0
Queue Length 95th (m)	#69.2	#144.7		6.2	64.7	24.6		6.7	0.0		#125.3	20.0
Internal Link Dist (m)		564.5			120.4			126.2			64.8	
Turn Bay Length (m)	255.0			90.0		150.0			30.0			
Base Capacity (vph)	281	770		95	422	676		599	680		420	785
Starvation Cap Reductn	0	0		0	0	0		0	0		0	0
Spillback Cap Reductn	0	0		0	0	0		0	0		0	0
Storage Cap Reductn	0	0		0	0	0		0	0		0	0
Reduced v/c Ratio	0.77	0.70		0.09	0.60	0.63		0.03	0.01		0.97	0.58

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 30.4	Intersection LOS: C
Intersection Capacity Utilization 80.0%	ICU Level of Service D
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Mitch Owens & Albion



Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	46	0	59	14	0	23	16	671	6	25	830	106
Future Vol, veh/h	46	0	59	14	0	23	16	671	6	25	830	106
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	20	-	-	-	55	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	100	2	100	2	2	100	100	2	2
Mvmt Flow	46	0	59	14	0	23	16	671	6	25	830	106

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1651	1642	468	1171	1692	674	936	0	0	677	0	0
Stage 1	933	933	-	706	706	-	-	-	-	-	-	-
Stage 2	718	709	-	465	986	-	-	-	-	-	-	-
Critical Hdwy	7.33	6.53	6.93	8.8	6.53	7.7	4.13	-	-	5.6	-	-
Critical Hdwy Stg 1	6.53	5.53	-	7.6	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	8	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.519	4.019	3.319	4.45	4.019	4.25	2.219	-	-	3.15	-	-
Pot Cap-1 Maneuver	71	99	542	87	93	291	730	-	-	528	-	-
Stage 1	287	344	-	273	438	-	-	-	-	-	-	-
Stage 2	419	436	-	378	325	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	59	86	542	70	81	291	730	-	-	528	-	-
Mov Cap-2 Maneuver	59	86	-	70	81	-	-	-	-	-	-	-
Stage 1	277	309	-	263	423	-	-	-	-	-	-	-
Stage 2	372	421	-	303	292	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	81.9	37.5	0.2	0.8
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	730	-	-	59	542	70	291	528	-	-
HCM Lane V/C Ratio	0.022	-	-	0.78	0.109	0.2	0.079	0.047	-	-
HCM Control Delay (s)	10	0	-	170.9	12.5	68.9	18.4	12.2	0.6	-
HCM Lane LOS	B	A	-	F	B	F	C	B	A	-
HCM 95th %tile Q(veh)	0.1	-	-	3.4	0.4	0.7	0.3	0.1	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	916	684	26	21	10
Future Vol, veh/h	10	916	684	26	21	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	15	-	-	70	20	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	916	684	26	21	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	710	0	-	0	1633	355
Stage 1	-	-	-	-	697	-
Stage 2	-	-	-	-	936	-
Critical Hdwy	4.13	-	-	-	6.63	6.93
Critical Hdwy Stg 1	-	-	-	-	5.83	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.219	-	-	-	3.519	3.319
Pot Cap-1 Maneuver	887	-	-	-	101	642
Stage 1	-	-	-	-	456	-
Stage 2	-	-	-	-	381	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	887	-	-	-	100	642
Mov Cap-2 Maneuver	-	-	-	-	100	-
Stage 1	-	-	-	-	451	-
Stage 2	-	-	-	-	381	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	37.5
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	887	-	-	-	100	642
HCM Lane V/C Ratio	0.011	-	-	-	0.21	0.016
HCM Control Delay (s)	9.1	-	-	-	50.3	10.7
HCM Lane LOS	A	-	-	-	F	B
HCM 95th %tile Q(veh)	0	-	-	-	0.7	0

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	0	59	14	0	53	16	671	36	25	830	106
Future Vol, veh/h	16	0	59	14	0	53	16	671	36	25	830	106
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	25	-	-	20	-	-	-	55	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	100	2	100	2	2	100	100	2	2
Mvmt Flow	16	0	59	14	0	53	16	671	36	25	830	106

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1681	1672	468	1186	1707	689	936	0	0	707	0	0
Stage 1	933	933	-	721	721	-	-	-	-	-	-	-
Stage 2	748	739	-	465	986	-	-	-	-	-	-	-
Critical Hdwy	7.33	6.53	6.93	8.8	6.53	7.7	4.13	-	-	5.6	-	-
Critical Hdwy Stg 1	6.53	5.53	-	7.6	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	8	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.519	4.019	3.319	4.45	4.019	4.25	2.219	-	-	3.15	-	-
Pot Cap-1 Maneuver	68	95	542	85	91	284	730	-	-	510	-	-
Stage 1	287	344	-	267	431	-	-	-	-	-	-	-
Stage 2	404	423	-	378	325	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	50	82	542	68	79	284	730	-	-	510	-	-
Mov Cap-2 Maneuver	50	82	-	68	79	-	-	-	-	-	-	-
Stage 1	277	308	-	257	415	-	-	-	-	-	-	-
Stage 2	317	408	-	301	291	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	32.8	31.2	0.2	0.8
HCM LOS	D	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	730	-	-	50	542	68	284	510	-	-
HCM Lane V/C Ratio	0.022	-	-	0.32	0.109	0.206	0.187	0.049	-	-
HCM Control Delay (s)	10	0	-	107.8	12.5	71.2	20.6	12.4	0.6	-
HCM Lane LOS	B	A	-	F	B	F	C	B	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.1	0.4	0.7	0.7	0.2	-	-