MILL VALLEY LIVING
GERRY EMON ROAD
ALMONTE, ONTARIO

TRAFFIC IMPACT STUDY

July 29, 2021

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Prepared for:

Houchaimi Holdings Inc.

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TRAFFIC IMPACT STUDY

1. INTRODUCTION

A Site Plan Control Application has been prepared for the development of a parcel of land at the south end of Industrial Drive in the Town of Almonte. A Site Plan Control Application was prepared in the fall of 2020 for the site under the development name of Orchard View Suites. A Traffic Impact Study was conducted by this firm and a report prepared dated September 29, 2020. Since that time the project has been taken over by Houchaimi Holdings Inc. who is developing the lands adjacent to the south limit of the site. The project has been renamed Mill Valley Living and will have a revised unit count and front on a new municipal street called Gerry Emon Road. Gerry Emon Road will connect the future development south of the site to Industrial Drive north of the site. Figure 1.1 shows the location of the proposed senior development.

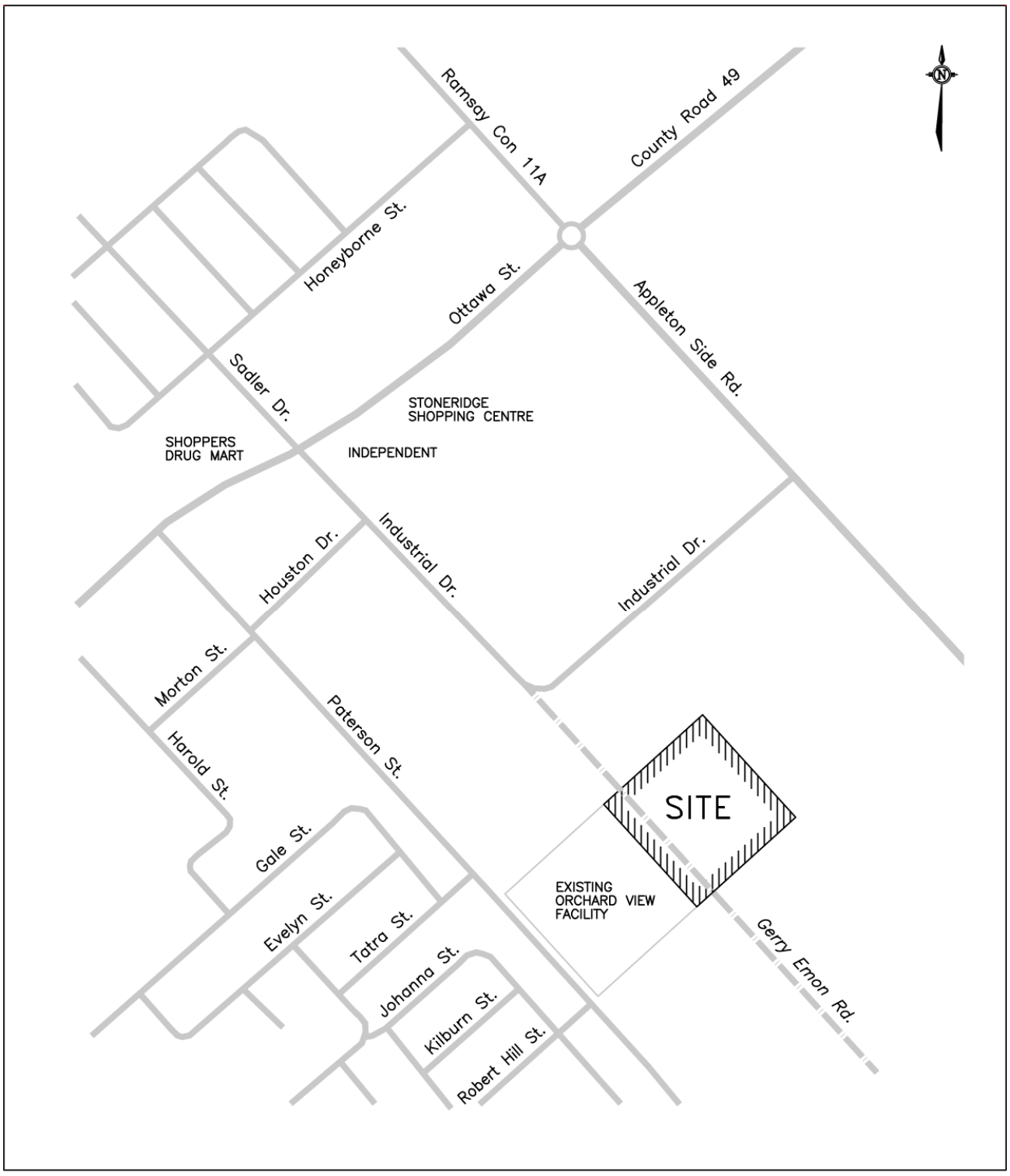
The Mill Valley Living will be located on 3.42 ha of vacant land and consist of senior townhouse units and a four storey apartment building. The senior development will have two accesses and 18 private driveways onto Gerry Emon Road.

The firm of D. J. Halpenny & Associates Ltd. has been retained by the owner of the lands to prepare a Traffic Impact Study (TIS) report for the senior development which will revise and replace the September 29, 2020 TIS report for the Orchard View Estates development. The report will examine the impact that the site will have on the operation of the intersection of Industrial Drive and Ottawa Street, the intersection of Industrial Drive and Appleton Side Road, and the Industrial Drive and new Gerry Emon Road intersection. The study will identify any modifications to the municipal roads which would be triggered by the construction of the senior residential development.

1.1 Purpose and Scope of Work

The purpose of the Traffic Impact Study (TIS) will be to examine the operation of the municipal intersections of Industrial Drive and Ottawa Street, Industrial Drive and Appleton Side Road, and Industrial Drive and Gerry Emon Road intersection. The analysis would be conducted for the expected traffic at the year 2023 when the total development is expected to be completed and substantially occupied, and at the year 2028 which represents five years beyond completion. The time period would be for the weekday peak AM and PM hour of the adjacent roads which would be the time of day which would experience the highest volume of traffic along the adjacent roads.

FIGURE 1.1
SITE LOCATION PLAN



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2. ADJACENT ROADS AND INTERSECTIONS

Roadways

Gerry Emon Road is a new municipal local street connecting the future development south of the site to Industrial Drive north of the site. The road would be a local street designed to current municipal standards with an 8.5 m wide pavement width.

Industrial Drive is a local commercial street located approximately 275 m north of the site. Industrial Drive connects to both Ottawa Street and Appleton Side Road and has an unposted speed limit of 50 km./h. The road has a rural cross-section with a pavement width of approximately 8.5 m. A pedestrian sidewalk is provided along the west side of the road from Ottawa Street to approximately 60 m south of Houston Drive. Although there still is little development along Industrial Drive, the area is designated as the Mississippi Mills Business Park providing serviced lots.

Ottawa Street is an east-west road located 725 m north of the Mill Valley Living site. Ottawa Street is an arterial road under the jurisdiction of the Municipality of Mississippi Mills west of the Appleton Side Road roundabout, and under the jurisdiction of Lanark County (CR 42) east of Appleton Side Road. The road is a four lane undivided urban road with pedestrian sidewalks along both the north and south side of the road. There are no cycling facilities along the road. The speed limit is posted at 50 km./h.

Appleton Side Road is a two lane north-south rural road under the jurisdiction of Lanark County (CR 17). There are no pedestrian sidewalks or cycling lanes along the road. The speed limit is posted at 50 km./h., which changes to 80 km./h. approximately 40 m south of Industrial Drive. Industrial Drive terminates at Appleton Side Road approximately 450 m east of the proposed Gerry Emon Road.

Intersections

The intersection of Industrial Drive and Ottawa Street is controlled by traffic signals. The following is the lane configuration of the intersection:

Northbound Industrial Dr.	One shared left/through lane
	One exclusive right turn lane
Southbound Sadler Dr.	One shared through/right lane
	One exclusive left turn lane
Eastbound Ottawa St.	One exclusive left turn lane
	One through lane
	One shared through/right lane
Westbound Ottawa St.	One exclusive left turn lane
	One through lane
	One shared through/right lane

Figure 2.1 shows the northbound Industrial Drive approach and westbound Ottawa Street approach from Google Maps Streetview.

FIGURE 2.1 - INDUSTRIAL/OTTAWA INTERSECTION
LOOKING SOUTH TOWARDS INDUSTRIAL DRIVE NORTHBOUND APPROACH

LOOKING EAST TOWARDS OTTAWA STREET WESTBOUND APPROACH

The Industrial/Appleton Side intersection is located approximately 440 m south of the roundabout at the intersection of Ottawa Street and Appleton Side Road. The intersection is a two-way stop controlled “T” intersection with Industrial Drive forming the eastbound stop controlled approach. The following shows the lane configuration of the intersection:

Northbound Appleton Side	One shared left/through lane
Southbound Appleton Side	One shared through/right lane
Eastbound Industrial Dr.	One shared left/right turn lane (Stop Sign)

Figure 2.2 shows a view of Appleton Side Road and the eastbound Industrial Drive approach from Google Maps Streetview.

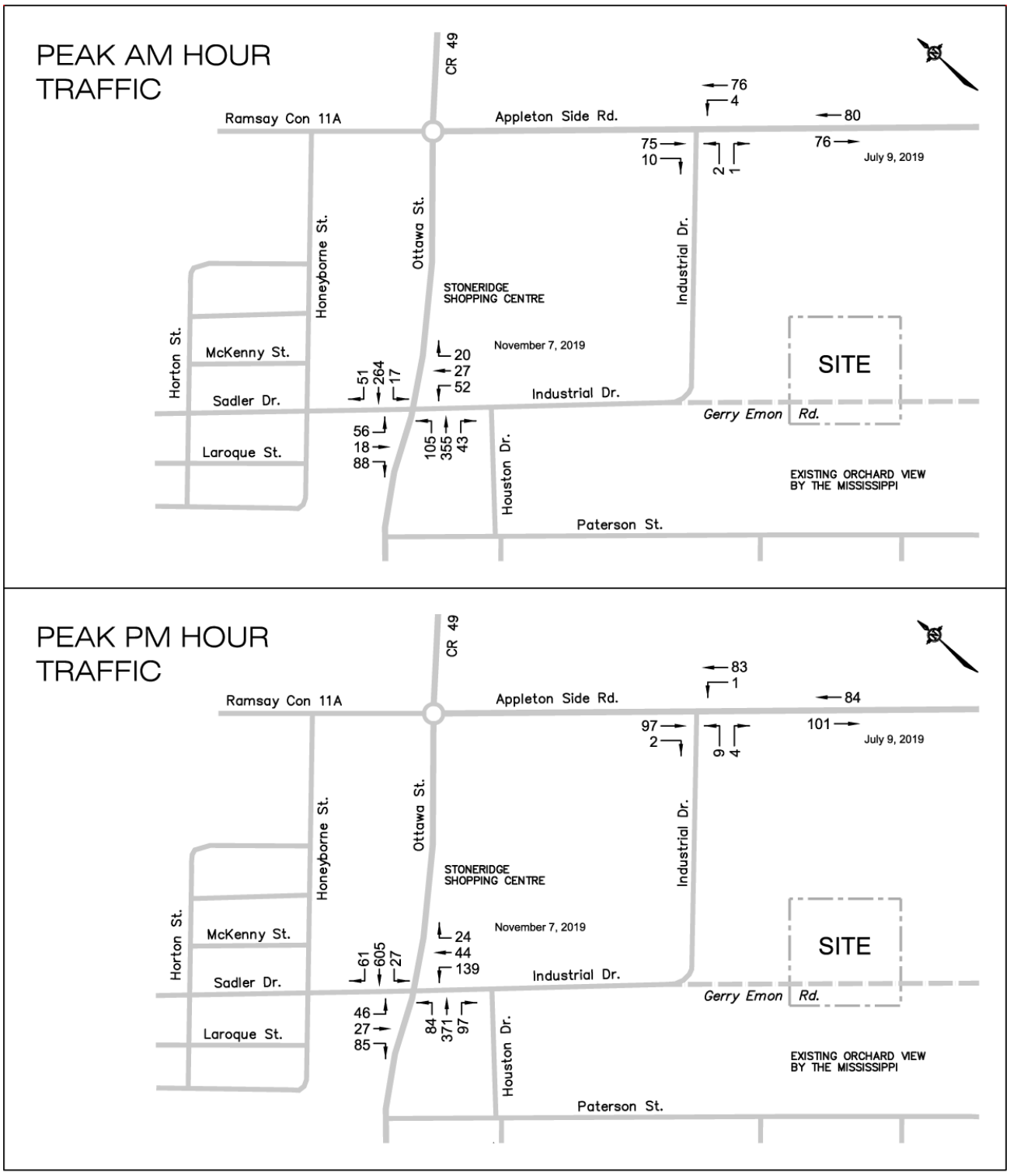
FIGURE 2.2 - INDUSTRIAL/APPLETON SIDE INTERSECTION
LOOKING SOUTH TOWARDS APPLETON SIDE RD. & EASTBOUND APPROACH

Figure 2.3 shows the 2019 peak AM and PM hour traffic counts at the Industrial/Ottawa and Industrial/Appleton Side intersections. The 2019 peak hour traffic counts at the Industrial/Ottawa intersection were obtained from the February 18, 2020 *Technical Memorandum* prepared for the Municipality of Mississippi Mills. The counts at the Appleton Side Road were determined from the 2019 peak hour counts obtained from Lanark County and were taken along Appleton Side Road approximately 300 m south of Industrial Drive.

3. PROPOSED MILL VALLEY LIVING

The Mill Valley Living development will be located on 3.42 ha of vacant land south of Industrial Drive adjacent to the east limit of the existing Orchard View by the Mississippi senior residence. Land use to the south and east of the site consists of vacant land, with the potential of commercial north of the site as part of the Mississippi Mills Business Park. Lands along Industrial Drive are zoned for commercial use, with commercial and retail use along Ottawa Street which is located 725 m north of the site. The site is currently zoned “I” Community Facility Zone which will support the proposed Mill Valley Living development.

FIGURE 2.3
2019 PEAK AM AND PM HOUR TRAFFIC COUNTS



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The development will comprise of 12 townhouse blocks for a total of 45 units, and an apartment building which would provide 48 apartment units. The apartment building will be an independent living development which will provide centralized amenities.

Table 3.1 provides an inventory of the number and type of units proposed for the senior development. A conceptual site plan for the development is provided as Figure 3.1.

TABLE 3.1
INVENTORY OF THE DEVELOPMENT

UNIT TYPE	NUMBER OF UNITS
Senior Townhouse Units (12 Blocks)	45 Units
4 Storey Senior Apartment Building	48 Units
Total Senior Dwelling Units	93 Units

The private driveways of 18 townhouse units along with 2 accesses to the senior apartment building will all front onto the new Gerry Emon Road, an 8.5 m wide municipal road. A 1.82 m wide pedestrian sidewalk is provided along the outside of the interior road adjacent to the townhouses, and along Gerry Emon Road adjacent to the frontage of the site. The sidewalk will extend along the east side of Gerry Emon Road to Industrial Drive.

The townhouses will each provide parking in the unit's garage with additional space in the driveway. The apartment building will provide 76 parking spaces of which 4 will be barrier free spaces. The total development will provide 163 parking spaces. A bike rack for employees will be located near the rear entrance of the apartment building.

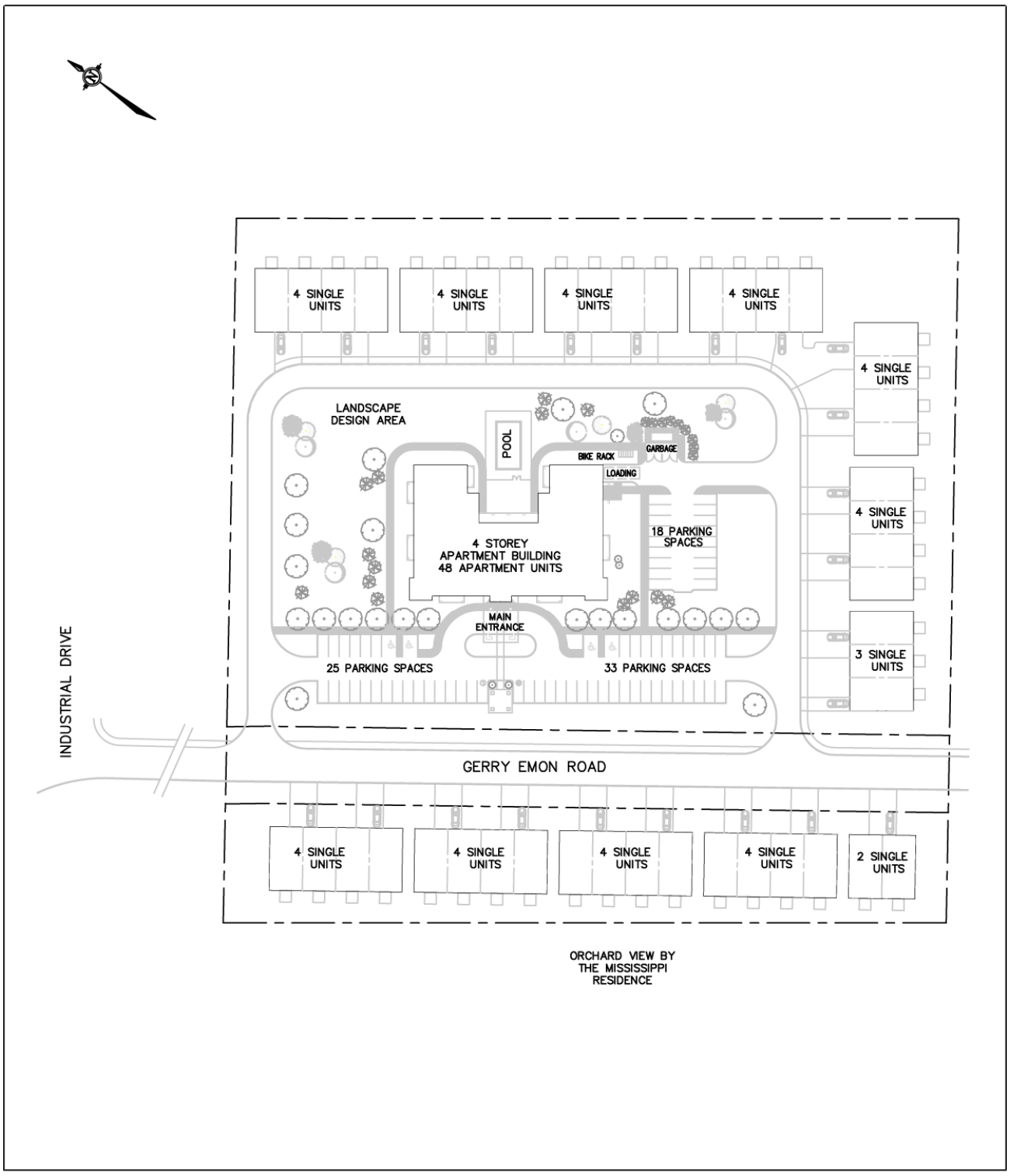
The Mill Valley Living development will be constructed according to market demand, with the senior building constructed first followed by the townhouses. The total development is expected to be completed by the year 2023.

4. TRAFFIC ANALYSIS

4.1 Trip Generation

The number of site generated trips for the senior townhouses and building were determined using the statistical data published in the Institute of Transportation Engineers (ITE) document, *Trip Generation, 10th Edition*. The analysis used the fitted curve equations for the trip generation rates for a senior townhouse and senior apartment building.

FIGURE 3.1
CONCEPTUAL SITE PLAN



The ITE trip graphs for the "Senior Adult Housing - Attached" are provided as Exhibit 1 in the Appendix. This category is for adult townhouse units which provide independent living in active adult communities which generally lack centralized amenities.

The apartment building is for a "Congregate Care Facility" with the ITE graphs provided as Exhibit 2. This category is for an independent care facility which provides centralized amenities such as dining, housekeeping and organized social activities. Limited medical facilities may or may not be provided. Table 4.1 presents the trip generation rates for the townhouses and apartment building which were derived from the ITE trip graphs using the fitted curve equations for the number of dwelling units of the development.

TABLE 4.1
TRIP GENERATION RATES

SENIOR HOUSING TYPE	ITE LAND USE	TRIP GENERATION RATE	
		Peak AM Hr.	Peak PM Hr.
45 Townhouse Units	Senior Adult Housing - Attached ITE Land Use Code 252	T = 0.20(X) - 1.66	T = 0.24(X) - 2.11
48 Apartment Units	Congregate Care Facility ITE Land Use Code 253	T = 0.05(X) + 2.13	T = 0.14(X) + 5.10

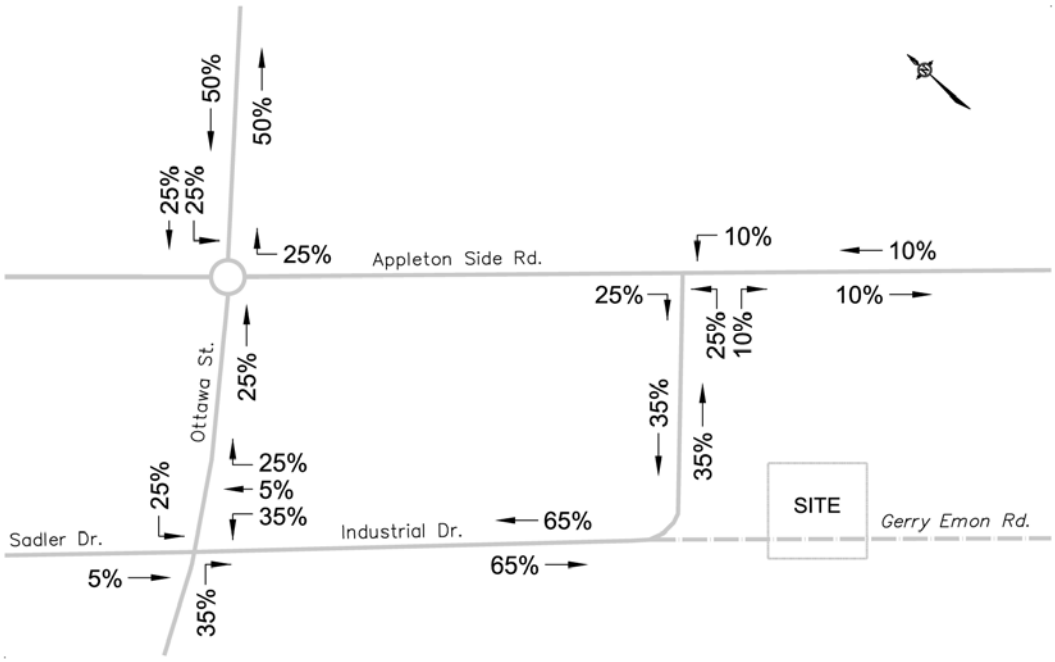
Table 4.2 shows the expected number of peak hour site generated trips for the site during the weekday peak AM and PM hour of the adjacent street traffic. Since there is currently no public transit service in the Town of Almonte, there were no adjustments applied to the site generated trips for public transit. All trips to/from the senior development are considered primary trips with no pass-by trip adjustments applied.

TABLE 4.2
PEAK HOUR SITE TRIPS GENERATED

UNIT TYPE	WEEKDAY PEAK AM HR.			WEEKDAY PEAK PM HR.		
	TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT
45 Townhouse Units	7	2 (35%)	5 (65%)	9	5 (60%)	4 (40%)
48 Apartment Units	5	3 (60%)	2 (40%)	12	6 (53%)	6 (47%)
Total Senior Trips	12	**5**	**7**	21	**11**	**10**

4.2 Trip Distribution

The distribution of site generated trips entering and exiting the Mill Valley Living development was determined by examination of the proportion of peak hour traffic at the Industrial/Ottawa intersection and traffic along Appleton Side Road. The distribution of traffic would represent the trip pattern of workers at the senior apartment building, and the possible destinations of residents of the townhouse units. The site generated trips were distributed to the proportions shown below for both the peak AM and PM hour.



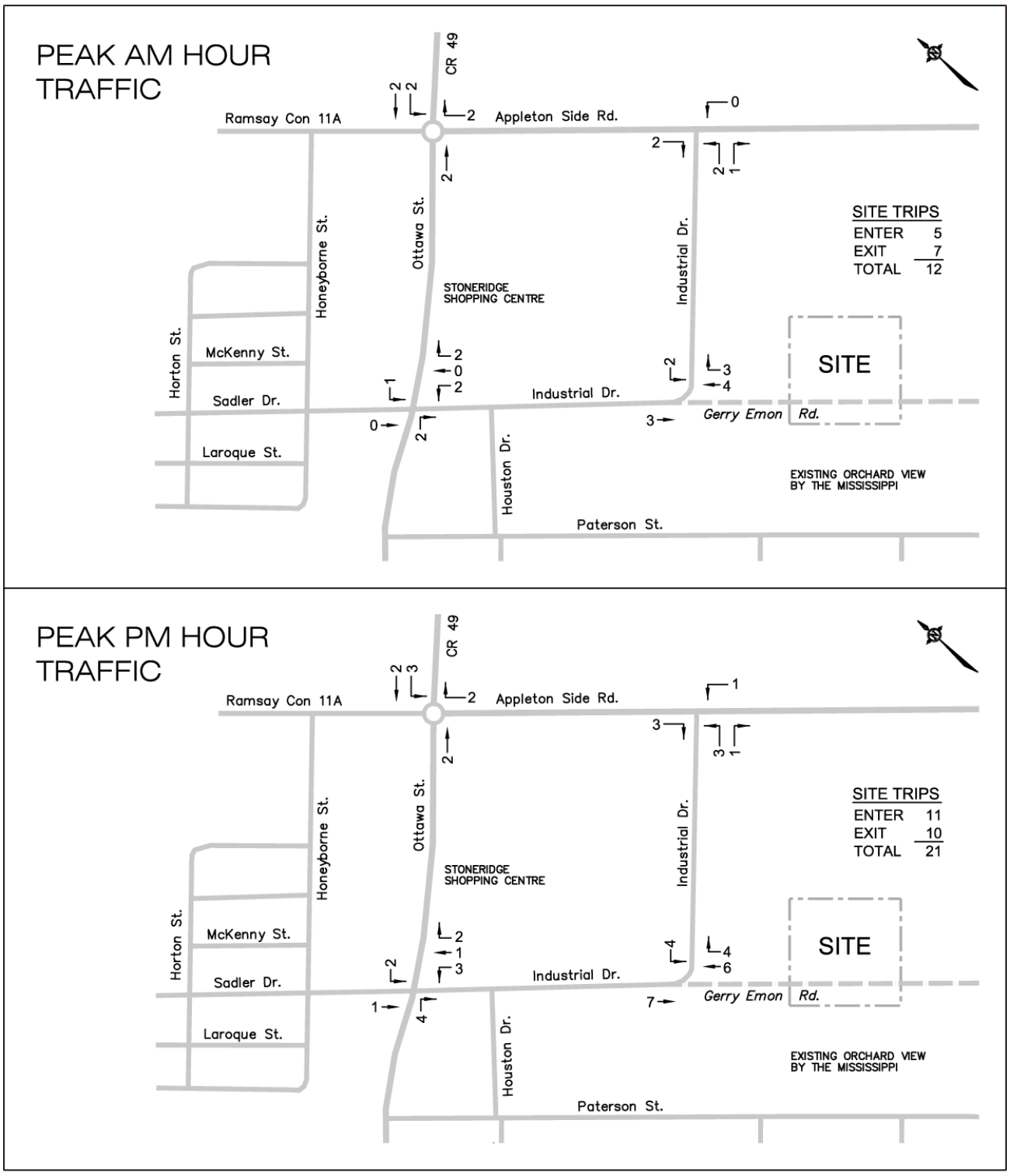
Site generated trips from Table 4.2 were distributed onto the adjacent roads to the proportions shown above. Figure 4.1 shows the expected weekday peak AM and PM hour site generated trips for the apartment building and townhouse units of the Mill Valley Living development.

5. TRAFFIC IMPACT

5.1 Background and Total Traffic Volumes

Much of the area surrounding the proposed development has experienced development both residential and commercial/retail in the past years. Available land along Ottawa Street has been developed as commercial/retail, with Ottawa Street being modified to a four lane road with traffic signals at the Industrial/Ottawa and Paterson/Ottawa intersections and a roundabout at the Appleton Side/Ottawa intersection. There is still some land available for development in the area including the serviced lots in the Mississippi Mills Business Park along Industrial Drive.

FIGURE 4.1
PEAK AM AND PM HOUR SITE GENERATED TRIPS



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The study has based the growth in background traffic on the historical growth obtained from Statistics Canada 2016 Census Profile for the Town of Almonte. The following is the population of the town:

Year		Population
2011	→	4,822
2016	→	5,039

The census information determined that the average annual compounded population growth within the Town of Almonte was 0.884 percent. The study has therefore assumed an average annual compounded increase of 1.0 percent, which translates to the following growth factors between the 2019 traffic counts (Figure 2.1) and the expected 2023 and 2028 background traffic. The growth factors were applied to all approaches of the Industrial/Ottawa and Industrial/Appleton Side intersections.

Growth Factor - 1.0% Annual Increase

2019 → 2023	1.041
2019 → 2028	1.094

In addition to the annual growth within the Town, the lands to the south of the site are proposed to be developed as residential. The Mill Valley Estates will contain approximately 406 residential units proportioned to the following:

Single-Family Dwellings	137
Semi-Detached Dwellings	128
Townhouse Dwellings	141
	406 Dwelling Units

The Mill Valley Estates will have entrance/exit points onto Paterson Street and Apple Side Road, with the new Gerry Emon Road extending north through the subdivision and Mill Valley Living to connect to Industrial Drive. The expected number of site generated trips was determined using the ITE *Trip Generation, 10th Edition* document and proportioning trips onto Paterson Street, Appleton Side Road and the new Gerry Emon Road. Although the Mill Valley Estate subdivision has not received approval, the study has assumed full construction of the 406 units by the time Mill Valley Living is completed in 2023 with 40 percent of the trips proportioned to Gerry Emon Road.

Figure 5.1 shows the expected 2023 peak AM and PM hour background volume of traffic utilizing the above growth factors (excluding site generated trips), and trips from the full development of the Mill Valley Estates subdivision. Figure 5.2 presents the 2028 peak hour background traffic.

The total traffic volumes are the addition of the future background traffic and the expected site generated trips (Figure 4.1). Figure 5.3 shows the 2023 total volume of traffic and Figure 5.4 the 2028 total traffic.

FIGURE 5.1
2023 PEAK AM AND PM HOUR BACKGROUND TRAFFIC

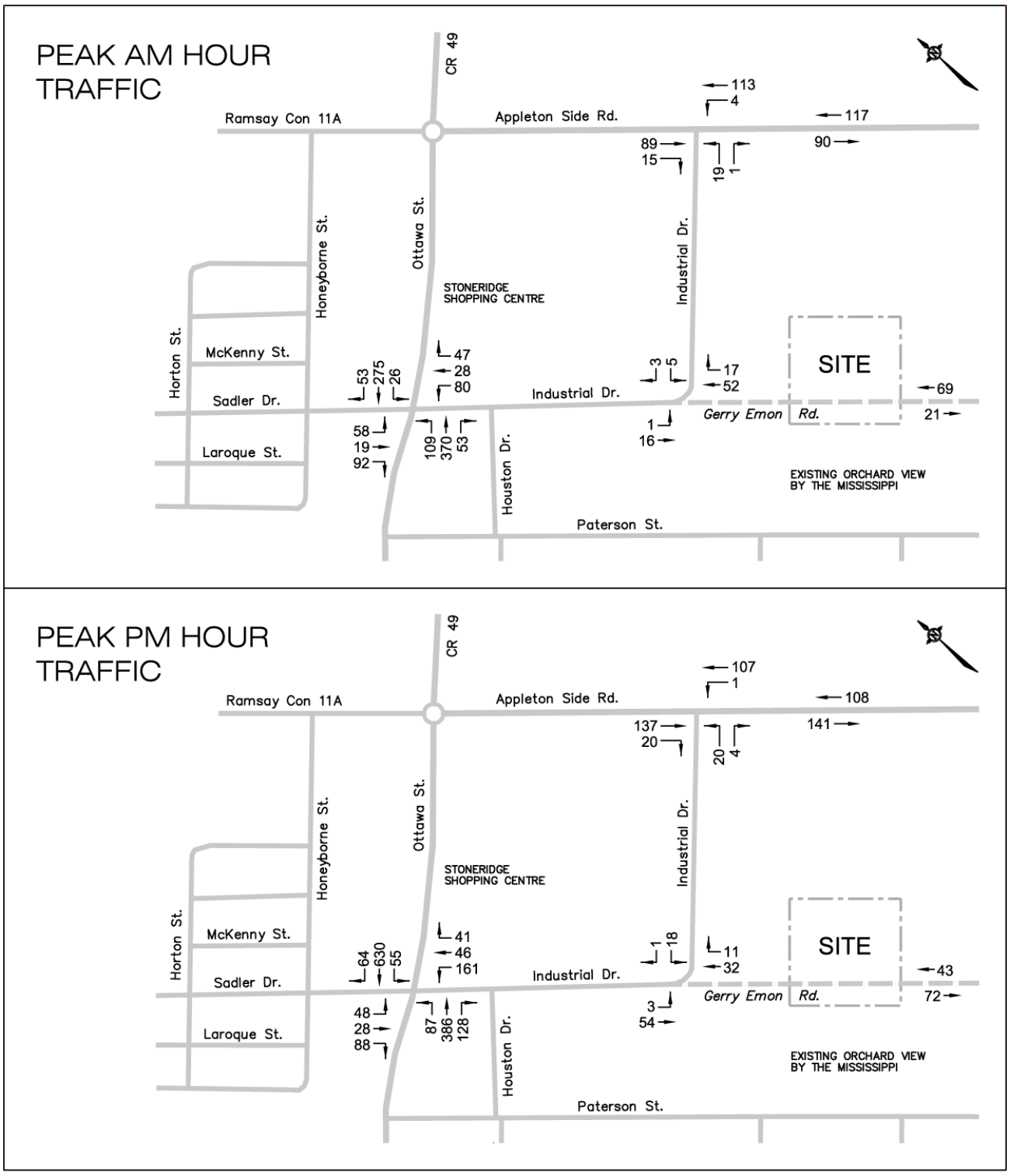

FIGURE 5.2
2028 PEAK AM AND PM HOUR BACKGROUND TRAFFIC

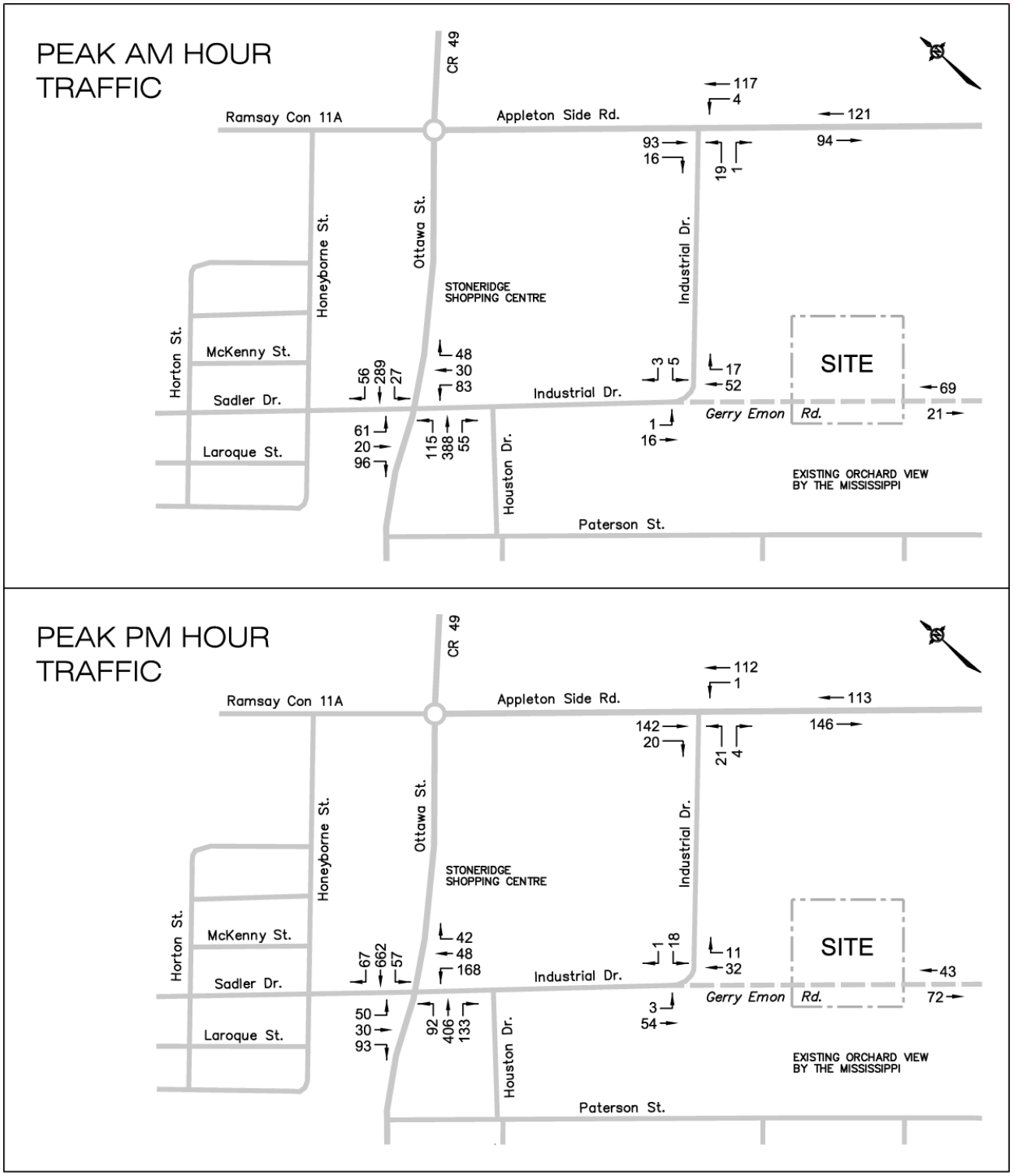

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FIGURE 5.3
2023 PEAK AM AND PM HOUR TOTAL TRAFFIC

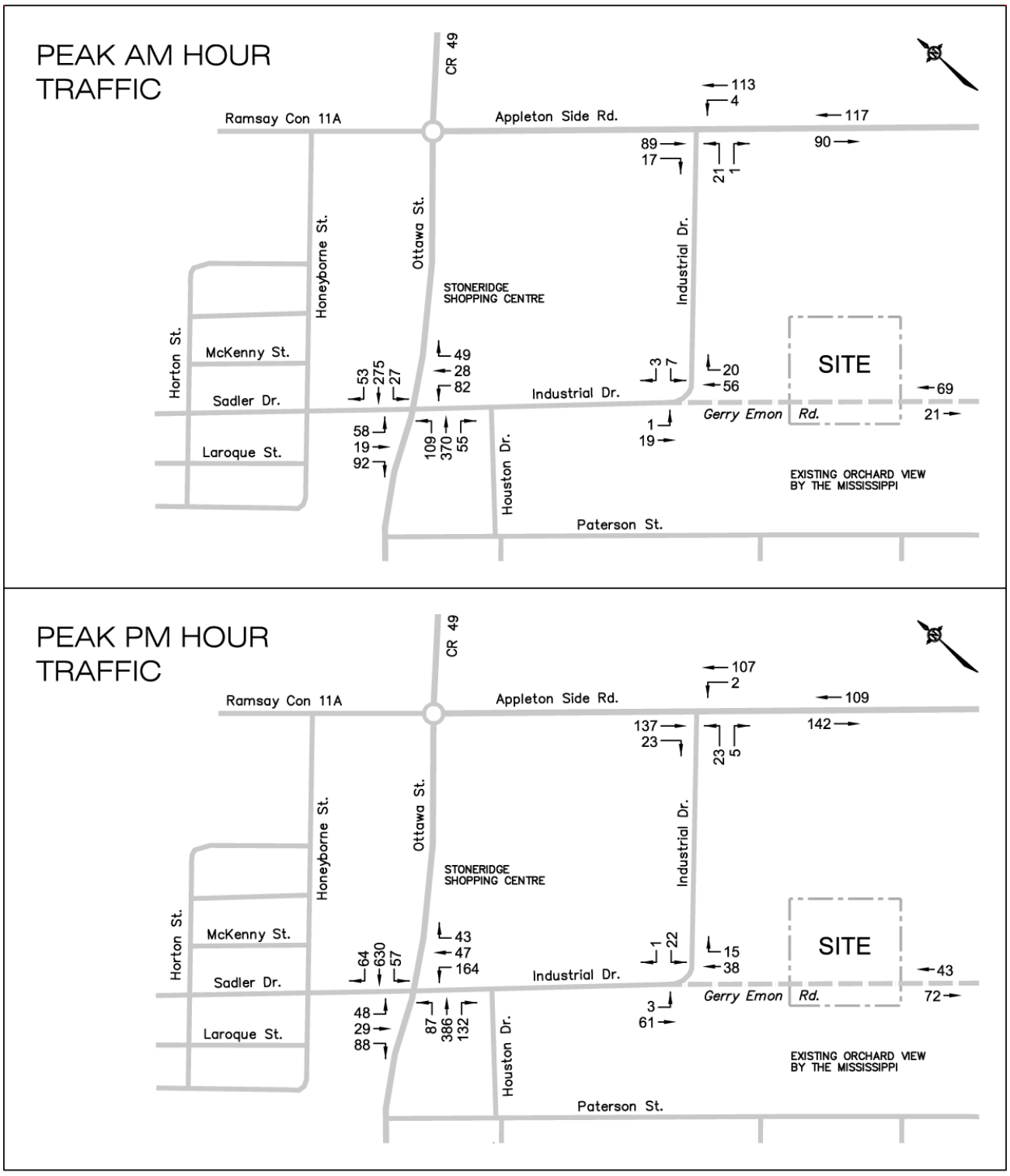
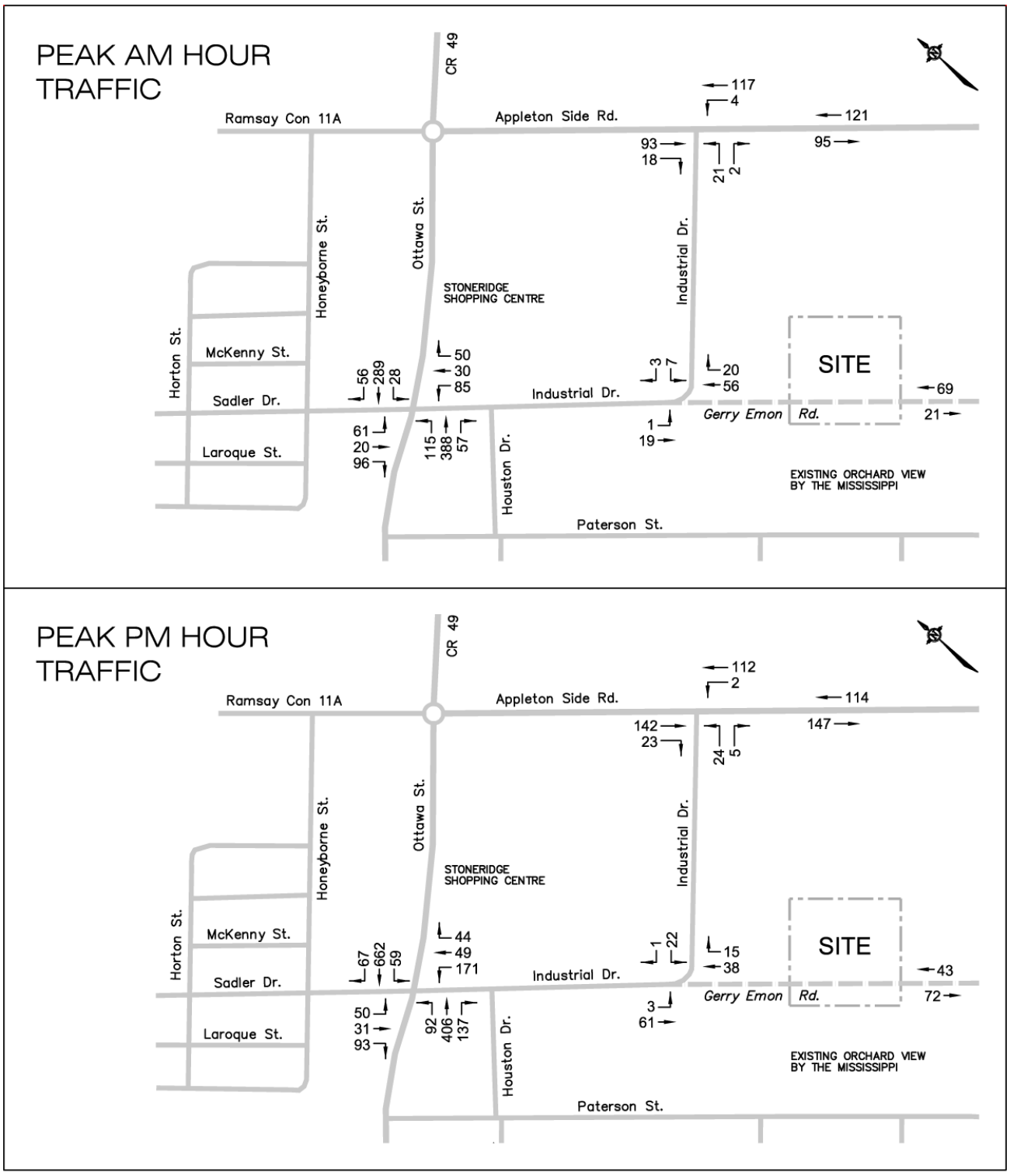


FIGURE 5.4
2028 PEAK AM AND PM HOUR TOTAL TRAFFIC



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5.2 Traffic Analysis

The Traffic Impact Study will examine the operation of the Industrial/Ottawa and Industrial/Appleton Side intersections including an examination for the requirement of an exclusive northbound Appleton Side Road left turn lane and sight distance analysis. The analysis will also examine the geometry and traffic controls at the new intersection of Industrial/Gerry Emon. The time period of the analysis would be the weekday peak AM and PM hour of the adjacent streets which are the peak time periods of the surrounding roads as determined by the traffic counts. The study will examine the operation of the intersections for the year 2023 when the total development is expected to be completed, and at the year 2028. The analysis will utilize the *Highway Capacity Software, Version 7.9.5,* which uses the capacity analysis procedure as documented in the *Highway Capacity Manual (HCM) 2010 and HCM 6th Edition*.

For a signalized intersection, the operation or level of service of an intersection is determined from the average control delay per vehicle, which is estimated for each lane group and aggregated for each approach and for the intersection as a whole. The following relates the level of service with the control delay at each lane movement:

LEVEL OF SERVICE	CONTROL DELAY
Level of Service A	≤ 10 sec./vehicle
Level of Service B	> 10-20 sec./vehicle
Level of Service C	> 20-35 sec./vehicle
Level of Service D	> 35-55 sec./vehicle
Level of Service E	> 55-80 sec./vehicle
Level of Service F	> 80 sec./vehicle

For unsignalized intersections, the level of service of each lane movement and approach is determined as a function of the average control delay of vehicles at the approach. The following relates the level of service of each lane movement with the expected control delay at the approach.

LEVEL OF SERVICE	AVERAGE CONTROL DELAY	
Level of Service A	0-10 sec./vehicle	Little or No Delay
Level of Service B	>10-15 sec./vehicle	Short Traffic Delays
Level of Service C	>15-25 sec./vehicle	Average Traffic Delays
Level of Service D	>25-35 sec./vehicle	Long Traffic Delays
Level of Service E	>35-50 sec./vehicle	Very Long Traffic Delays
Level of Service F	>50 sec./vehicle	Extreme Delays – Demand Exceeds Capacity

The expected length of queue at the critical lane movements for an unsignalized two-way stop controlled intersection was determined by the calculation of the 95th percentile queue at the lane approach. The 95th percentile queue length is the calculated 95th greatest queue length out of 100 occurrences at a movement during a 15-minute peak period. The 95th percentile queue length is a function of the capacity of a movement and the total expected traffic, with the calculated value determining the magnitude of the queue by representing the queue length as fractions of vehicles. The results of the analysis are discussed in detail in the following sections:

Industrial Drive and Ottawa Street Intersection

The intersection of Industrial Drive and Ottawa Street is a signalized intersection located approximately 725 m north of the Mill Valley Living site. Ottawa Street forms the eastbound and westbound approaches, Industrial Drive the northbound approach, and Sadler Drive the southbound approach. The lane configuration is listed in this report under Section 2 - Adjacent Roads and Intersections. The traffic signal timing plan and traffic counts were obtained from the 2020 Technical Memorandum, *Mississippi Mills Traffic and Safety Review*.

The analysis of the existing 2019 peak hour traffic determined that the intersection operated at a Level of Service (LOS) "B" during the peak AM and PM hour. Table 5.1 summarizes the operation of the intersection with the analysis sheets provided in the Appendix as Exhibit 3 for the peak AM hour and Exhibit 4 for the peak PM hour.

TABLE 5.1
INDUSTRIAL/OTTAWA (Traffic Signals) – LOS & Control Delay

Intersection Approach	WEEKDAY PEAK AM HOUR YEAR 2019 **2023** (2028)		WEEKDAY PEAK PM HOUR YEAR 2019 **2023** (2028)	
	LOS	**Delay (sec.)**	**LOS**	**Delay (sec.)**
EB Left – Ottawa St.	A **A** (A)	2.7 **2.7** (2.8)	A **A** (A)	3.4 **3.7** (4.2)
EB Through – Ottawa St.	B **B** (B)	10.6 **11.2** (11.3)	B **B** (B)	11.1 **12.6** (13.1)
EB Right – Ottawa St.	B **B** (B)	10.3 **10.9** (11.0)	B **B** (B)	10.8 **12.3** (12.8)
WB Left – Ottawa St.	A **A** (A)	4.9 **4.9** (5.0)	A **A** (A)	4.8 **5.3** (5.6)
WB Through – Ottawa St.	B **B** (B)	12.5 **12.7** (12.8)	B **B** (B)	13.7 **14.3** (15.0)
WB Right – Ottawa St.	B **B** (B)	12.1 **12.3** (12.5)	B **B** (B)	13.4 **13.9** (14.6)
NB Left/Through – Industrial Dr.	B **B** (B)	12.0 **13.1** (13.2)	B **B** (B)	15.1 **16.2** (16.8)
SB Left – Sadler Dr.	B **B** (B)	14.0 **15.3** (15.6)	B **B** (C)	17.9 **19.4** (20.4)
SB Through/Right – Sadler Dr.	B **B** (B)	12.1 **12.1** (12.2)	B **B** (B)	12.7 **13.0** (13.4)
TOTAL	B **B** (B)	10.6 **11.0** (11.2)	B **B** (B)	12.3 **13.1** (13.7)

The study has also examined the operation of the Industrial/Ottawa intersection for the expected traffic at the year 2023. This analysis would represent the traffic at the completion of the Mill Valley Living development and would include all expected site generated trips. The 2023 analysis determined that the intersection would continue to operate at a LOS "B" during both the peak AM and PM hour as shown in Table 5.1 and in the analysis sheets as Exhibit 5 and Exhibit 6.

For the expected 2028 traffic which represents 5 years beyond completion, the intersection would continue to operate at a LOS "B" during the peak AM and PM hour as shown in Table 5.1. Exhibit 7 presents a detailed analysis sheet for the peak AM hour traffic, and Exhibit 8 for the peak PM hour traffic.

The site would generate a low volume of trips which would not trigger the requirement for further roadway or intersection modifications. The construction of the Mill Valley Living development would not have an impact on the recommendations for the Industrial/Ottawa intersection which are presented in the *Mississippi Mills Traffic and Safety Review* report.

Industrial Drive and Appleton Side Road Intersection

The intersection of Industrial Drive and Appleton Side Road is a "T" intersection with Industrial Drive forming the eastbound approach and Appleton Side Road the northbound and southbound approaches. The intersection is located 450 m east of Gerry Emon Road, and is a two-way stop controlled intersection with a stop sign installed at the eastbound Industrial Drive approach. The 2019 traffic counts along Appleton Side Road were taken by the County just south of Industrial Drive, with the Industrial Drive traffic estimated by the size and type of use of development along Industrial Drive. All approaches would comprise of a single lane sharing traffic movements. The lane configuration is listed in this report under Section 2 - Adjacent Roads and Intersections.

The 2019 operational analysis determined that the intersection would operate well with both the northbound Appleton Side Road shared left/through movement and eastbound Industrial shared left/right turn movement functioning at a LOS "A". Table 5.2 summarizes the operation of the intersection with the analysis sheets provided as Exhibit 9 and Exhibit 10.

TABLE 5.2
INDUSTRIAL/APPLETON SIDE (Two-Way Stop) – LOS & Control Delay

Intersection Approach	WEEKDAY PEAK AM HOUR YEAR 2019 **2023** (2028)		WEEKDAY PEAK PM HOUR YEAR 2019 **2023** (2028)	
	LOS	**Delay (sec.)**	**LOS**	**Delay (sec.)**
EB Left/Right – Industrial Drive	A **A** (A)	9.2 **9.9** (10.0)	A **B** (B)	9.4 **10.1** (10.2)
NB Left/Through – Appleton Side	A **A** (A)	7.4 **7.5** (7.5)	A **A** (A)	7.4 **7.6** (7.6)

The northbound Appleton Side Road approach will consist of one lane with a shared left/through movement. This approach was examined to determine if an exclusive northbound left turn lane is warranted following the development of the site. The

analysis utilized the left turn lane warrant graphs which are contained in the Ministry of Transportation Ontario document (MTO), *Geometric Design Standards for Ontario Highways.* The left turn lane warrants used the expected total 2028 peak AM and PM hour traffic (Figure 5.4) and the warrant graphs for a design speed of 90 km./h. (posted speed of 80 km./h.) since the posted speed limit changes from 50 km./h. to 80 km./h. approximately 40 m south of Industrial Drive. The expected 2028 traffic during the peak AM and PM hour would not warrant the requirement for an exclusive northbound Appleton Side Road left turn lane, with the analysis provided as Exhibit 11 in the Appendix. The intersection geometry used in the operational analysis of the intersection for the total 2023 and 2028 traffic assumed the existing lane configuration of the Industrial/Appleton Side intersection.

For the expected 2023 and 2028 volume of traffic following the completion of the Mill Valley Living development, the intersection would continue to function at the same level of service at all approaches as the existing 2019 traffic with the northbound and eastbound approaches functioning at a LOS "A". Table 5.2 summarizes the results with Exhibit 12 and 13 presenting the analysis for the 2023 peak AM and PM hour, and Exhibit 14 and 15 the analysis for the 2028 peak hour traffic.

The 95th percentile queue using the 2028 traffic determined the queue at the eastbound Industrial Drive approach to be 0.1 vehicles during the peak AM and PM hour. The queue at the northbound Appleton Side Road approach would be 0.0 vehicles during both the peak AM hour and PM hour. The expected 95th percentile queue would not present an operational problem at the intersection or require modifications to the intersection due to the development of the Mill Valley Living development.

A sight line analysis was conducted at the proposed Industrial/Appleton Side intersection. The analysis utilized the "Turning Sight Distance" guideline published by the Transportation Association of Canada (TAC) in the *Geometric Design Guide for Canadian Roads*. The guideline used was for a vehicle turning left onto a two lane roadway across a passenger vehicle approaching from the left. Figure 2.3.3.4a of the TAC manual was used with a design speed of 90 km./h. (posted speed of 80 km./h.). The guideline determined the required sight distance to be 173 m (B-1 graph line). Appleton Side Road in the vicinity of the site has a straight and level alignment with a clear view of 440 m north to the Ottawa/Appleton Side roundabout, and to the south a distance which exceeds the TAC guideline which was determined in Figure 2.3.3.4a. Exhibit 16 shows the required sight distance for left turning vehicles from the TAC manual.

Industrial Drive and Gerry Emon Road Intersection

The Industrial/Gerry Emon intersection is a new intersection with Gerry Emon Road forming the northbound approach and Industrial Drive the southbound and westbound approaches. The volume of traffic would be low with all approaches to the intersection comprising of a single lane with shared movements. The following shows the proposed lane configuration of the intersection:

Northbound Gerry Emon Rd. One shared through/right lane (Stop Sign)
Southbound Industrial Dr. One shared left/through lane (Stop Sign)
Westbound Industrial Dr. One shared left/right turn lane (Stop Sign)

The intersection was analyzed assuming intersection control provided by all-way stop signs. The reasoning for all-way stop signs is that the northbound and southbound approaches have different street names and the name change should take place at a stop or signal controlled intersection. The all-way stop signs would also add a measure of traffic calming along Gerry Emon Road past the senior development.

The operational analysis was conducted for the peak AM and PM hour for the expected traffic at the year 2028. Since the 2023 and 2028 traffic scenarios both assume full build out of the Mill Valley Living and Mill Valley Estates developments, the expected 2023 and 2028 traffic would be similar with both scenarios assuming a very conservative volume of traffic.

During both the peak AM and PM hours all approaches to the intersection would function at a LOS "A". Table 5.3 summarizes the operation of the intersection with the analysis sheets provided as Exhibit 17 for the peak AM hour and Exhibit 16 the peak PM hour.

TABLE 5.3
INDUSTRIAL/GERRY EMON (All-Way Stop) – LOS & Control Delay

Intersection Approach	WEEKDAY PEAK AM HOUR YEAR (2028)		WEEKDAY PEAK PM HOUR YEAR (2028)	
	LOS	Delay (sec.)	LOS	Delay (sec.)
WB Left/Right – Industrial Drive	(A)	(7.2)	(A)	(7.5)
NB Through/Right – Gerry Emon	(A)	(7.2)	(A)	(7.2)
SB Left/Through – Industrial Drive	(A)	(7.2)	(A)	(7.4)
TOTAL	(A)	(7.2)	(A)	(7.3)

The Industrial/Gerry Emon intersection would operate at an acceptable level of service as an all-way stop controlled intersection. There would be no requirement for modifications to the existing roadways with the exception of constructing the northbound Gerry Emon Road approach.

6. FINDINGS AND RECOMMENDATIONS

Houchaimi Holdings Inc. is proposing the development of 3.42 ha of vacant land at the northeast portion of the Town of Almonte. The site is located adjacent to the east property limit of the existing Orchard View by the Mississippi retirement residence. The new development will be called Mill Valley Living which proposes the construction of 48 senior apartment units and 45 townhouse units for seniors, for a total of 93 dwelling units.

The site will have two accesses onto Gerry Emon Road which is a new road proposed to link the Mill Valley Estates subdivision south of the site with Industrial Drive north of the site. Gerry Emon Road will be a municipal road constructed by the developer as part of the development agreement. The new street will link to Industrial Drive forming a new intersection located 475 m south of Ottawa Street and 450 m west of Appleton Side Road.

The Traffic Impact Study has examined the operation of the Industrial/Ottawa and Industrial/Appleton Side intersections during both the weekday peak AM and PM hour. The analysis years would be at the completion of the development in 2023, and at 2028 which represents five years beyond completion. The operation of the new Industrial/Gerry Emon intersection will be conducted for the 2028 peak AM and PM hour. The findings and recommendations of the study are summarized in the following:

1. The trip generation analysis determined that the total trips from the Mill Valley Living would generate a total of 12 trips entering and exiting during the peak AM hour, and 21 trips entering and exiting during the peak PM hour. The trips would access the municipal road network along a new road called Gerry Emon Road which passes through the site and connects to Industrial Drive to the north. Trips from the site would be distributed to the Industrial/Ottawa and Industrial/Appleton Side intersections.

2. The study analysis has assumed an average annual compounded growth in background traffic of 1.0 percent to the horizon years of the study which were determined by the historical increase in population of the Town. The background traffic also included the completion of the Mill Valley Estates subdivision adjacent to the south limit of the site. The subdivision proposes 406 dwelling units with access to the road network from accesses to Paterson Street, Apple Side Road, and along Gerry Emon Road. The study has conservatively assumed completion of the subdivision by 2023. The study has also assigned 40 percent of the trips from the Mill Valley Estates subdivision to travel along Gerry Emon Road past the site. The percentage was based on the origin/destination of subdivision trips and the length and convenience of access to the surrounding road network.

3. The intersection of Industrial Drive and Ottawa Street is controlled by traffic signals. The operational analysis for the 2019 traffic determined that the intersection currently operates at a Level of Service (LOS) “B” during the weekday peak AM and PM hour. Following the development of the Mill Valley

Living development, the intersection would continue to operate at a LOS "B" during both the 2023 and 2028 peak AM and PM hour. There would be no requirement for modifications to the intersection due to the development of the site as Mill Valley Living.

4. The intersection of Industrial Drive and Appleton Side Road is a two-way stop controlled intersection with a stop sign installed at the eastbound Industrial Drive approach. The operational analysis, which was conducted for the eastbound Industrial Drive and northbound Appleton Side Road approaches using the existing 2019 traffic counts, determined that the intersection would function at a LOS "A" during both the peak AM and PM hour.

   A left turn lane warrant analysis was conducted at the intersection using the MTO *Geometric Design Standards for Ontario Highways* and the expected 2028 peak AM and PM hour traffic volumes. The analysis for the northbound left/through approach movement determined that an exclusive northbound Appleton Side Road left turn lane was not warranted. The operational analysis was completed for the expected traffic at the year 2023 and 2028 using the existing lane configuration of the intersection. The analysis determined that both the eastbound Industrial Drive and northbound Appleton Side Road approaches functioned at a LOS "A" during the peak AM and PM hour. There would be no requirement for modifications to the intersection due to the development of the site as Mill Valley Living.

   A sight line analysis determined that the intersection would exceed the turning sight distance guidelines as set out in the Transportation Association of Canada (TAC) document, *Geometric Design Guide for Canadian Roads*, for the minimum distance for vehicles turning left from Appleton Side Road onto Industrial Drive.

5. The proposed intersection of Industrial Drive and Emon Road was analyzed as an all-way stop controlled intersection which would provide a measure of traffic calming along Gerry Emon Road past the site. The analysis of the 2028 peak AM and PM hour determined that the intersection would operate at a LOS "A". All approaches would consist of a single lane with no exclusive turn lanes. There would be no requirement for modifications to the intersection with the exception of constructing a northbound Gerry Emon Road approach.

Prepared by:

David J. Halpenny, M. Eng., P. Eng.

APPENDIX

ITE TRIP GENERATION DATA SHEETS

LEFT TURN LANE WARRANT ANALYSIS

OPERATIONAL ANALYSIS WORK SHEETS

TURNING SIGHT DISTANCE ANALYSIS

EXHIBIT 1
ITE TRIP GENERATION MANUAL 10th Ed. – Senior Adult Housing - Attached (252)

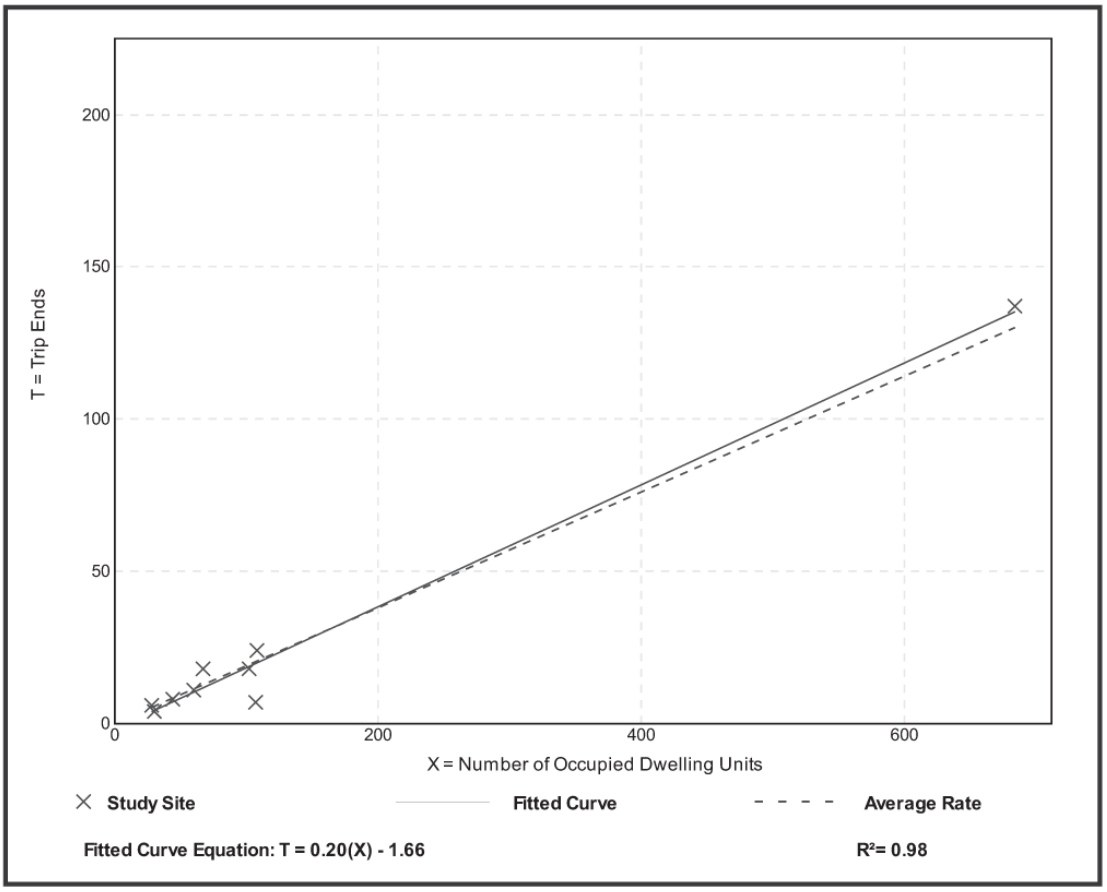
Senior Adult Housing - Attached
(252)

Vehicle Trip Ends vs:	**Occupied Dwelling Units**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 7 and 9 a.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	9
Avg. Num. of Occupied Dwelling Units:	137
Directional Distribution:	35% entering, 65% exiting

Vehicle Trip Generation per Occupied Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.19	0.07 - 0.27	0.05

Data Plot and Equation



Senior Adult Housing - Attached
(252)

Vehicle Trip Ends vs:	**Occupied Dwelling Units**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	9
Avg. Num. of Occupied Dwelling Units:	137
Directional Distribution:	60% entering, 40% exiting

Vehicle Trip Generation per Occupied Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.23	0.08 - 0.36	0.06

Data Plot and Equation

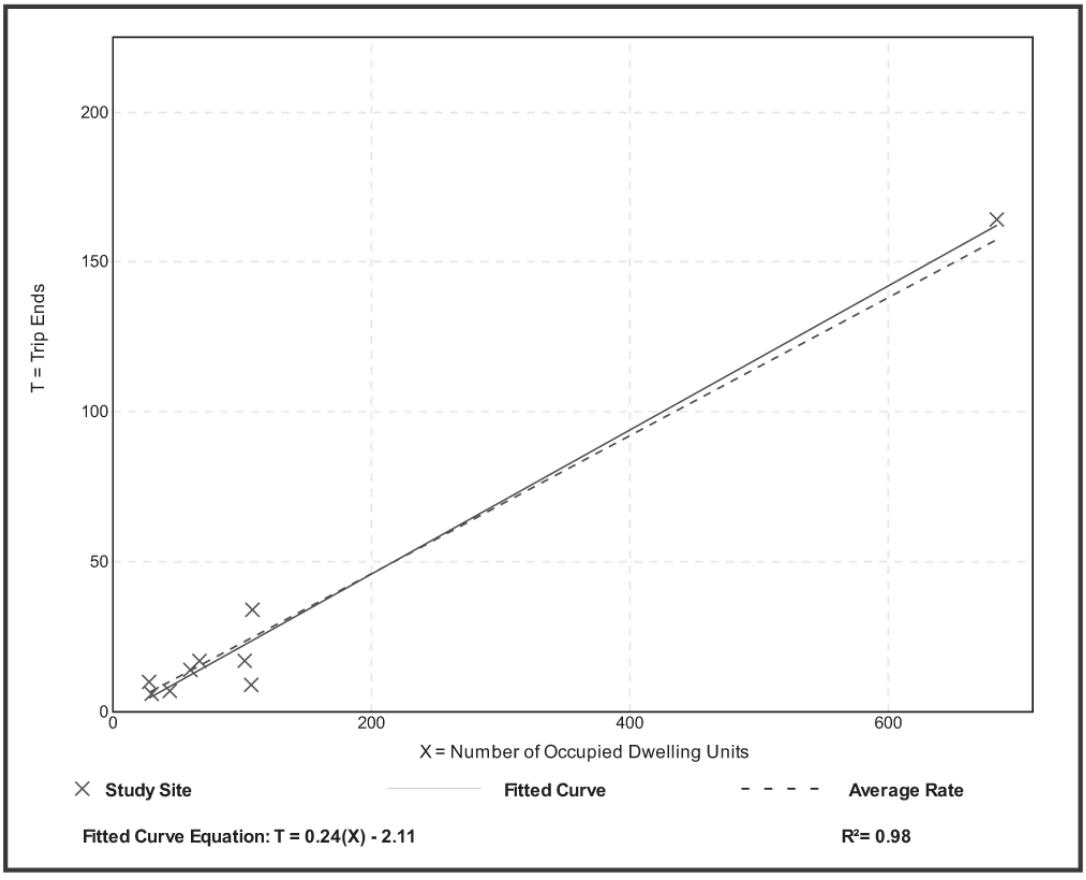


EXHIBIT 2
ITE TRIP GENERATION MANUAL 10th Ed. – Congregate Care Facility (253)

Congregate Care Facility
(253)

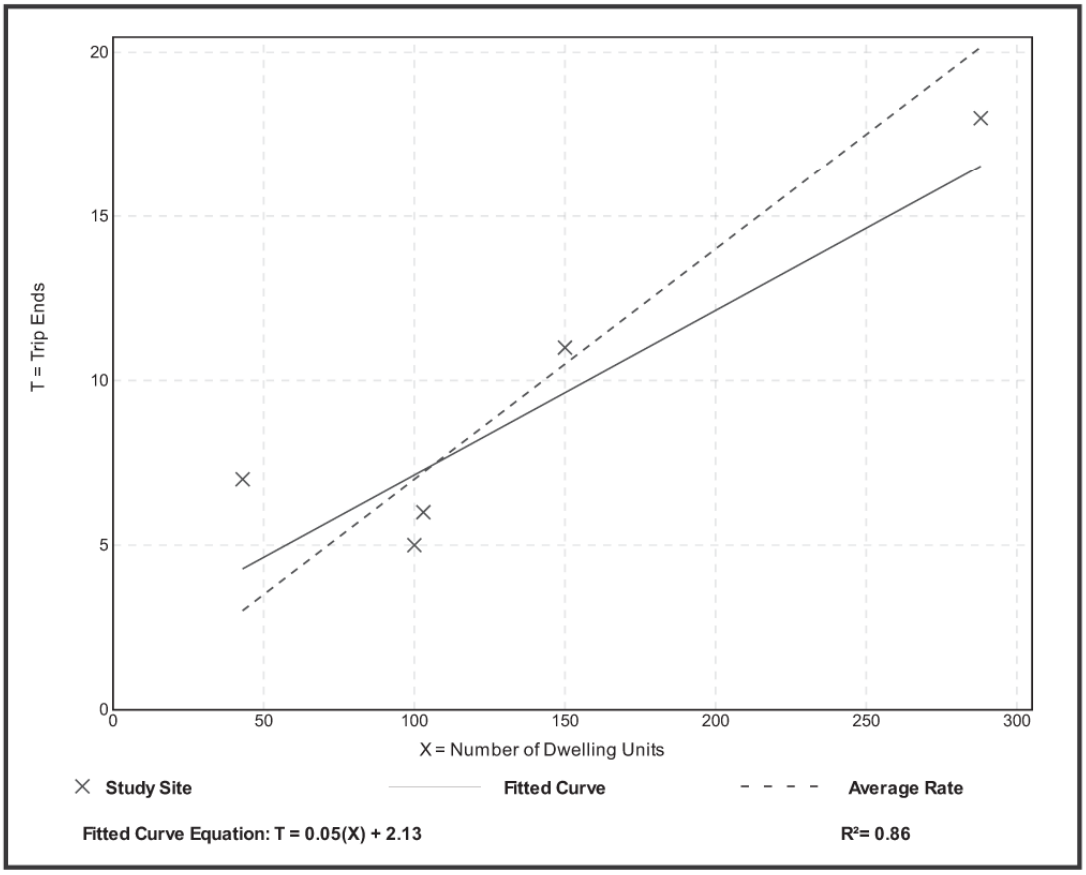
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 5
Avg. Num. of Dwelling Units: 137
Directional Distribution: 60% entering, 40% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.07	0.05 - 0.16	0.03

Data Plot and Equation

Caution – Small Sample Size



Congregate Care Facility
(253)

Vehicle Trip Ends vs:	**Dwelling Units**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	6
Avg. Num. of Dwelling Units:	131
Directional Distribution:	53% entering, 47% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.18	0.15 - 0.30	0.04

Data Plot and Equation

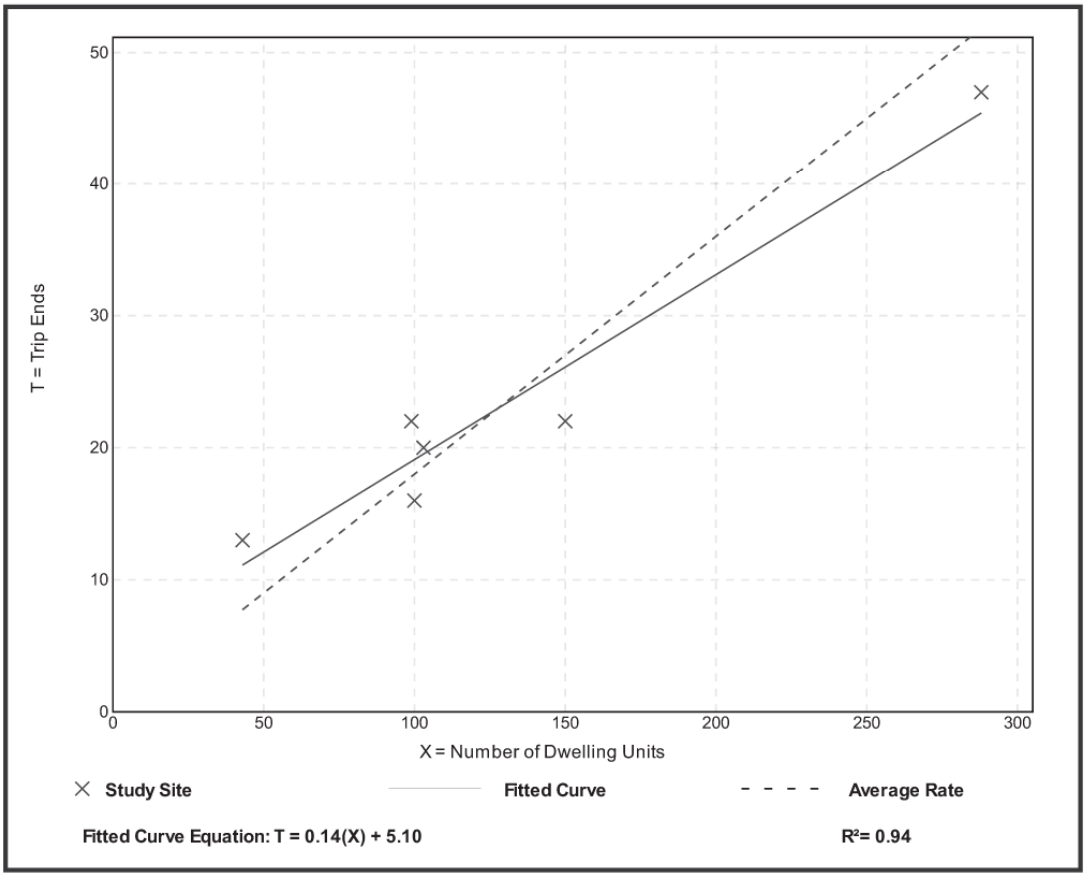
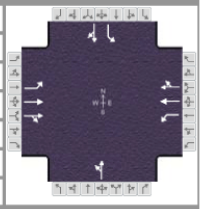


EXHIBIT 3
2019 WEEKDAY PEAK AM HOUR ANALYSIS – Industrial/Ottawa

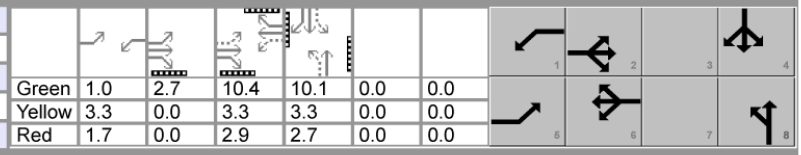
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst		Analysis Date	9/1/2020	Area Type	Other
Jurisdiction	Lanark County	Time Period	Peak AM Hour	PHF	0.92
Urban Street	Ottawa Street	Analysis Year	2019	Analysis Period	1> 7:00
Intersection	Industrial/Ottawa	File Name	720_2019_ex_am.xus		
Project Description	Mill Valley Living				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	105	355	43	17	264	51	52	27		56	18	88

Signal Information			
Cycle, s	41.4	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	1.0	2.7	10.4	10.1	0.0	0.0	
Yellow	3.3	0.0	3.3	3.3	0.0	0.0	
Red	1.7	0.0	2.9	2.7	0.0	0.0	

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	1.1	4.0	1.1	4.0		8.0		6.0
Phase Duration, s	8.7	19.3	6.0	16.6		16.1		16.1
Change Period, ($Y+R_c$), s	5.0	6.2	5.0	6.2		6.0		6.0
Max Allow Headway (*MAH*), s	3.1	3.1	3.1	3.1		3.3		3.3
Queue Clearance Time (g_s), s	2.9	5.7	2.2	5.2		5.0		6.4
Green Extension Time (g_e), s	0.1	1.4	0.0	1.4		0.5		0.5
Phase Call Probability	0.73	1.00	0.19	1.00		0.95		0.95
Max Out Probability	0.00	0.00	0.00	0.00		0.00		0.00

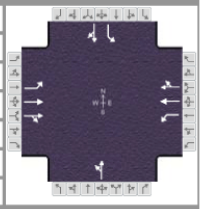
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8		7	4	14
Adjusted Flow Rate (*v*), veh/h	114	219	213	18	174	168		86		61	115	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1856	1781	1781	1856	1747		1302		1374	1615	
Queue Service Time (g_s), s	0.9	3.7	3.7	0.2	3.1	3.2		0.6		1.5	2.3	
Cycle Queue Clearance Time (g_c), s	0.9	3.7	3.7	0.2	3.1	3.2		3.0		4.4	2.3	
Green Ratio (*g/C*)	0.68	0.34	0.34	0.57	0.28	0.28		0.27		0.27	0.27	
Capacity (*c*), veh/h	923	634	609	646	513	483		493		445	432	
Volume-to-Capacity Ratio (*X*)	0.124	0.346	0.350	0.029	0.339	0.348		0.174		0.137	0.267	
Back of Queue (*Q*), ft/ln (50 th percentile)	1.8	28.9	27.5	0.9	26.2	24.8		12.3		10.1	17	
Back of Queue (*Q*), veh/ln (50 th percentile)	0.1	1.1	1.1	0.0	1.0	1.0		0.5		0.4	0.7	
Queue Storage Ratio (*RQ*) (50 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00	0.00	
Uniform Delay (d_1), s/veh	2.6	10.5	10.2	4.9	12.3	12.0		12.0		13.9	12.0	
Incremental Delay (d_2), s/veh	0.0	0.1	0.1	0.0	0.1	0.2		0.1		0.1	0.1	
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Control Delay (*d*), s/veh	2.7	10.6	10.3	4.9	12.5	12.1		12.0		14.0	12.1	
Level of Service (LOS)	A	B	B	A	B	B		B		B	B	
Approach Delay, s/veh / LOS	8.8	A		11.9	B		12.0	B		12.7	B	
Intersection Delay, s/veh / LOS	10.6						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.66	B	1.90	B	2.26	B	2.26	B
Bicycle LOS Score / LOS	0.94	A	0.79	A	0.63	A	0.78	A

EXHIBIT 4
2019 WEEKDAY PEAK PM HOUR ANALYSIS – Industrial/Ottawa

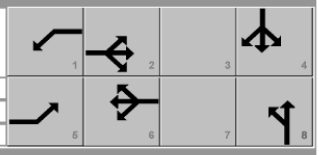
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst		Analysis Date	9/1/2020	Area Type	Other
Jurisdiction	Lanark County	Time Period	Peak PM Hour	PHF	0.92
Urban Street	Ottawa Street	Analysis Year	2019	Analysis Period	1> 7:00
Intersection	Industrial/Ottawa	File Name	720_2019_ex_pm.xus		
Project Description	Mill Valley Living				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	84	371	97	27	605	61	139	44		46	27	85

Signal Information					EB			WB			NB			SB		
Cycle, s	42.9	Reference Phase	2													
Offset, s	0	Reference Point	End	Green	1.5	1.8		12.0	10.5	0.0	0.0					
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	3.3	0.0		3.3	3.3	0.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.7	0.0		2.9	2.7	0.0	0.0					



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	1.1	4.0	1.1	4.0		8.0		6.0
Phase Duration, s	8.3	20.0	6.5	18.2		16.5		16.5
Change Period, (*Y+R c*), s	5.0	6.2	5.0	6.2		6.0		6.0
Max Allow Headway (*MAH*), s	3.1	3.1	3.1	3.1		3.3		3.3
Queue Clearance Time (*g s*), s	2.7	6.7	2.3	9.4		9.2		10.2
Green Extension Time (*g e*), s	0.1	2.4	0.0	2.4		0.7		0.7
Phase Call Probability	0.66	1.00	0.29	1.00		0.99		0.99
Max Out Probability	0.00	0.00	0.00	0.00		0.00		0.00

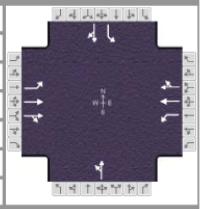
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8		7	4	14
Adjusted Flow Rate (*v*), veh/h	91	262	247	29	368	356		199		50	122	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1856	1720	1781	1856	1794		1174		1358	1646	
Queue Service Time (*g s*), s	0.7	4.6	4.7	0.3	7.3	7.4		4.7		1.5	2.5	
Cycle Queue Clearance Time (*g c*), s	0.7	4.6	4.7	0.3	7.3	7.4		7.2		8.2	2.5	
Green Ratio (*g/C*)	0.68	0.34	0.34	0.62	0.30	0.30		0.27		0.27	0.27	
Capacity (*c*), veh/h	743	645	598	635	565	546		455		309	430	
Volume-to-Capacity Ratio (*X*)	0.123	0.406	0.413	0.046	0.651	0.652		0.437		0.162	0.283	
Back of Queue (*Q*), ft/ln (50 th percentile)	1.6	36.8	34	1	62	58.8		36.9		10.1	19.3	
Back of Queue (*Q*), veh/ln (50 th percentile)	0.1	1.4	1.4	0.0	2.4	2.4		1.5		0.4	0.8	
Queue Storage Ratio (*RQ*) (50 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00	0.00	
Uniform Delay (*d 1*), s/veh	3.3	10.9	10.6	4.8	13.3	12.9		14.8		17.8	12.6	
Incremental Delay (*d 2*), s/veh	0.0	0.2	0.2	0.0	0.5	0.5		0.2		0.1	0.1	
Initial Queue Delay (*d 3*), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Control Delay (*d*), s/veh	3.4	11.1	10.8	4.8	13.7	13.4		15.1		17.9	12.7	
Level of Service (LOS)	A	B	B	A	B	B		B		B	B	
Approach Delay, s/veh / LOS	9.8	A		13.2	B		15.1	B		14.2	B	
Intersection Delay, s/veh / LOS	12.3						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.66	B	1.89	B	2.26	B	2.26	B
Bicycle LOS Score / LOS	0.98	A	1.11	A	0.82	A	0.77	A

EXHIBIT 5
2023 WEEKDAY PEAK AM HOUR ANALYSIS – Industrial/Ottawa

HCS7 Signalized Intersection Results Summary

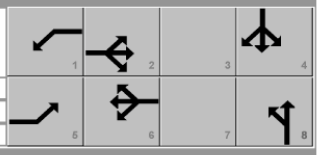
General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst		Analysis Date	9/1/2020	Area Type	Other
Jurisdiction	Lanark County	Time Period	Peak AM Hour	PHF	0.92
Urban Street	Ottawa Street	Analysis Year	2023	Analysis Period	1> 7:00
Intersection	Industrial/Ottawa	File Name	720_2023_tot_am.xus		
Project Description	Mill Valley Living				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	109	370	55	27	275	53	82	28		58	19	92

Signal Information			
Cycle, s	41.6	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	1.4	2.3	10.4	10.2	0.0	0.0	
Yellow	3.3	0.0	3.3	3.3	0.0	0.0	
Red	1.7	0.0	2.9	2.7	0.0	0.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	1.1	4.0	1.1	4.0		8.0		6.0
Phase Duration, s	8.7	18.9	6.4	16.6		16.2		16.2
Change Period, (*Y+R c*), s	5.0	6.2	5.0	6.2		6.0		6.0
Max Allow Headway (*MAH*), s	3.1	3.1	3.1	3.1		3.3		3.3
Queue Clearance Time (*g s*), s	3.0	6.1	2.3	5.4		6.5		8.1
Green Extension Time (*g e*), s	0.1	1.5	0.0	1.5		0.6		0.6
Phase Call Probability	0.75	1.00	0.29	1.00		0.97		0.97
Max Out Probability	0.00	0.00	0.00	0.00		0.00		0.00

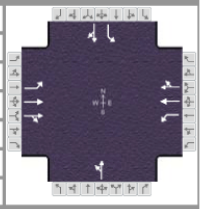
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8		7	4	14
Adjusted Flow Rate (*v*), veh/h	118	235	227	29	182	175		120		63	121	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1856	1766	1781	1856	1747		1192		1373	1615	
Queue Service Time (*g s*), s	1.0	4.0	4.1	0.3	3.3	3.4		2.1		1.7	2.5	
Cycle Queue Clearance Time (*g c*), s	1.0	4.0	4.1	0.3	3.3	3.4		4.5		6.1	2.5	
Green Ratio (*g/C*)	0.68	0.33	0.33	0.59	0.27	0.27		0.27		0.27	0.27	
Capacity (*c*), veh/h	912	612	583	640	510	480		473		397	436	
Volume-to-Capacity Ratio (*X*)	0.130	0.384	0.389	0.046	0.356	0.364		0.253		0.159	0.276	
Back of Queue (*Q*), ft/ln (50 th percentile)	2	32.6	30.7	1.2	27.7	26.2		19.5		11.2	18	
Back of Queue (*Q*), veh/ln (50 th percentile)	0.1	1.3	1.2	0.0	1.1	1.0		0.8		0.4	0.7	
Queue Storage Ratio (*RQ*) (50 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00	0.00	
Uniform Delay (*d 1*), s/veh	2.7	11.0	10.7	4.9	12.5	12.2		13.0		15.3	12.0	
Incremental Delay (*d 2*), s/veh	0.0	0.1	0.2	0.0	0.2	0.2		0.1		0.1	0.1	
Initial Queue Delay (*d 3*), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Control Delay (*d*), s/veh	2.7	11.2	10.9	4.9	12.7	12.3		13.1		15.3	12.1	
Level of Service (LOS)	A	B	B	A	B	B		B		B	B	
Approach Delay, s/veh / LOS	9.3	A		11.9	B		13.1	B		13.2	B	
Intersection Delay, s/veh / LOS	11.0						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.66	B	1.90	B	2.26	B	2.26	B
Bicycle LOS Score / LOS	0.97	A	0.81	A	0.68	A	0.79	A

EXHIBIT 6
2023 WEEKDAY PEAK PM HOUR ANALYSIS – Industrial/Ottawa

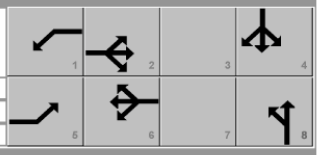
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst		Analysis Date	9/1/2020	Area Type	Other
Jurisdiction	Lanark County	Time Period	Peak PM Hour	PHF	0.92
Urban Street	Ottawa Street	Analysis Year	2023	Analysis Period	1> 7:00
Intersection	Industrial/Ottawa	File Name	720_2023_tot_pm.xus		
Project Description	Mill Valley Living				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	87	386	132	57	630	64	164	47		48	29	88

Signal Information					EB			WB			NB			SB		
Cycle, s	45.3	Reference Phase	2													
Offset, s	0	Reference Point	End	Green	2.7	0.8		12.8	11.8	0.0	0.0					
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	3.3	0.0		3.3	3.3	0.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.7	0.0		2.9	2.7	0.0	0.0					



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	1.1	4.0	1.1	4.0		8.0		6.0
Phase Duration, s	8.5	19.8	7.7	19.0		17.8		17.8
Change Period, (*Y+R c*), s	5.0	6.2	5.0	6.2		6.0		6.0
Max Allow Headway (*MAH*), s	3.1	3.1	3.1	3.1		3.3		3.3
Queue Clearance Time (*g s*), s	2.8	7.7	2.5	10.0		11.0		11.8
Green Extension Time (*g e*), s	0.1	2.7	0.1	2.7		0.8		0.8
Phase Call Probability	0.69	1.00	0.54	1.00		0.99		0.99
Max Out Probability	0.00	0.00	0.00	0.00		0.00		0.00

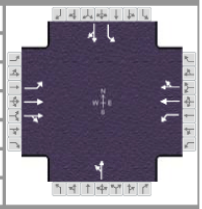
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8		7	4	14
Adjusted Flow Rate (*v*), veh/h	95	292	271	62	383	371		229		52	127	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1856	1689	1781	1856	1794		1136		1354	1647	
Queue Service Time (*g s*), s	0.8	5.6	5.7	0.5	8.0	8.0		6.2		1.6	2.7	
Cycle Queue Clearance Time (*g c*), s	0.8	5.6	5.7	0.5	8.0	8.0		9.0		9.8	2.7	
Green Ratio (*g/C*)	0.67	0.32	0.32	0.65	0.31	0.31		0.28		0.28	0.28	
Capacity (*c*), veh/h	715	607	553	625	575	556		452		282	448	
Volume-to-Capacity Ratio (*X*)	0.132	0.482	0.489	0.099	0.666	0.667		0.507		0.185	0.284	
Back of Queue (*Q*), ft/ln (50 th percentile)	2.3	47.5	43.2	1.8	69.6	65.9		46.4		11.5	21.1	
Back of Queue (*Q*), veh/ln (50 th percentile)	0.1	1.9	1.7	0.1	2.7	2.6		1.8		0.5	0.8	
Queue Storage Ratio (*RQ*) (50 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00	0.00	
Uniform Delay (*d 1*), s/veh	3.7	12.4	12.0	5.3	13.8	13.4		15.8		19.3	12.8	
Incremental Delay (*d 2*), s/veh	0.0	0.2	0.3	0.0	0.5	0.5		0.3		0.1	0.1	
Initial Queue Delay (*d 3*), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Control Delay (*d*), s/veh	3.7	12.6	12.3	5.3	14.3	13.9		16.2		19.4	13.0	
Level of Service (LOS)	A	B	B	A	B	B		B		B	B	
Approach Delay, s/veh / LOS	11.2		B	13.5		B	16.2		B	14.8		B
Intersection Delay, s/veh / LOS	13.1						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.67	B	1.90	B	2.26	B	2.26	B
Bicycle LOS Score / LOS	1.03	A	1.16	A	0.87	A	0.78	A

EXHIBIT 7
2028 WEEKDAY PEAK AM HOUR ANALYSIS – Industrial/Ottawa

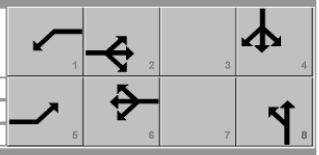
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst		Analysis Date	9/1/2020	Area Type	Other
Jurisdiction	Lanark County	Time Period	Peak AM Hour	PHF	0.92
Urban Street	Ottawa Street	Analysis Year	2028	Analysis Period	1> 7:00
Intersection	Industrial/Ottawa	File Name	720_2028_tot_am.xus		
Project Description	Mill Valley Living				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	115	388	57	28	289	56	85	30		61	20	96

Signal Information			
Cycle, s	41.8	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	1.5	2.3	10.4	10.3	0.0	0.0	
Yellow	3.3	0.0	3.3	3.3	0.0	0.0	
Red	1.7	0.0	2.9	2.7	0.0	0.0	

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	1.1	4.0	1.1	4.0		8.0		6.0
Phase Duration, s	8.8	19.0	6.5	16.6		16.3		16.3
Change Period, (*Y+R c*), s	5.0	6.2	5.0	6.2		6.0		6.0
Max Allow Headway (*MAH*), s	3.1	3.1	3.1	3.1		3.3		3.3
Queue Clearance Time (*g s*), s	3.0	6.3	2.3	5.6		6.8		8.5
Green Extension Time (*g e*), s	0.1	1.6	0.0	1.6		0.6		0.6
Phase Call Probability	0.77	1.00	0.30	1.00		0.97		0.97
Max Out Probability	0.00	0.00	0.00	0.00		0.00		0.00

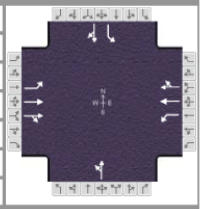
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8		7	4	14
Adjusted Flow Rate (*v*), veh/h	125	246	237	30	191	184		125		66	126	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1856	1767	1781	1856	1746		1180		1371	1616	
Queue Service Time (*g s*), s	1.0	4.3	4.3	0.3	3.5	3.6		2.2		1.8	2.6	
Cycle Queue Clearance Time (*g c*), s	1.0	4.3	4.3	0.3	3.5	3.6		4.8		6.5	2.6	
Green Ratio (*g/C*)	0.68	0.33	0.33	0.59	0.27	0.27		0.27		0.27	0.27	
Capacity (*c*), veh/h	903	612	583	633	508	479		469		389	437	
Volume-to-Capacity Ratio (*X*)	0.138	0.402	0.407	0.048	0.376	0.384		0.267		0.171	0.289	
Back of Queue (*Q*), ft/ln (50 th percentile)	2.2	34.5	32.7	1.3	29.7	28		20.7		12	19	
Back of Queue (*Q*), veh/ln (50 th percentile)	0.1	1.3	1.3	0.1	1.2	1.1		0.8		0.5	0.7	
Queue Storage Ratio (*RQ*) (50 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00	0.00	
Uniform Delay (*d 1*), s/veh	2.8	11.2	10.8	5.0	12.6	12.3		13.1		15.6	12.1	
Incremental Delay (*d 2*), s/veh	0.0	0.2	0.2	0.0	0.2	0.2		0.1		0.1	0.1	
Initial Queue Delay (*d 3*), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Control Delay (*d*), s/veh	2.8	11.3	11.0	5.0	12.8	12.5		13.2		15.6	12.2	
Level of Service (LOS)	A	B	B	A	B	B		B		B	B	
Approach Delay, s/veh / LOS	9.4	A		12.1	B		13.2	B		13.4	B	
Intersection Delay, s/veh / LOS	11.2						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.66	B	1.90	B	2.26	B	2.26	B
Bicycle LOS Score / LOS	0.99	A	0.82	A	0.69	A	0.81	A

EXHIBIT 8
2028 WEEKDAY PEAK PM HOUR ANALYSIS – Industrial/Ottawa

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst		Analysis Date	9/1/2020	Area Type	Other
Jurisdiction	Lanark County	Time Period	Peak PM Hour	PHF	0.92
Urban Street	Ottawa Street	Analysis Year	2028	Analysis Period	1> 7:00
Intersection	Industrial/Ottawa	File Name	720_2028_tot_pm.xus		
Project Description	Mill Valley Living				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	92	406	137	59	662	67	171	49		50	31	93

Signal Information												
Cycle, s	47.7	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On	Green	2.9	0.8	13.9	12.9	0.0	0.0		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.3	0.0	3.3	3.3	0.0	0.0		
				Red	1.7	0.0	2.9	2.7	0.0	0.0		

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	1.1	4.0	1.1	4.0		8.0		6.0
Phase Duration, s	8.7	20.9	7.9	20.1		18.9		18.9
Change Period, (*Y+R c*), s	5.0	6.2	5.0	6.2		6.0		6.0
Max Allow Headway (*MAH*), s	3.1	3.1	3.1	3.1		3.3		3.3
Queue Clearance Time (*g s*), s	2.9	8.3	2.6	10.9		11.9		12.7
Green Extension Time (*g e*), s	0.1	2.8	0.1	2.8		0.8		0.8
Phase Call Probability	0.73	1.00	0.57	1.00		1.00		1.00
Max Out Probability	0.00	0.00	0.00	0.00		0.00		0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8		7	4	14
Adjusted Flow Rate (*v*), veh/h	100	307	283	64	403	390		239		54	135	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1781	1856	1691	1781	1856	1794		1134		1351	1648	
Queue Service Time (*g s*), s	0.9	6.2	6.3	0.6	8.9	8.9		6.9		1.8	3.0	
Cycle Queue Clearance Time (*g c*), s	0.9	6.2	6.3	0.6	8.9	8.9		9.9		10.7	3.0	
Green Ratio (*g/C*)	0.66	0.33	0.33	0.65	0.31	0.31		0.29		0.29	0.29	
Capacity (*c*), veh/h	682	621	566	606	589	570		455		278	465	
Volume-to-Capacity Ratio (*X*)	0.147	0.494	0.501	0.106	0.684	0.684		0.525		0.196	0.290	
Back of Queue (*Q*), ft/ln (50 th percentile)	3.3	53.8	48.6	2.4	78.9	74.7		51.9		12.9	23.9	
Back of Queue (*Q*), veh/ln (50 th percentile)	0.1	2.1	1.9	0.1	3.1	3.0		2.0		0.5	0.9	
Queue Storage Ratio (*RQ*) (50 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00	0.00	
Uniform Delay (*d 1*), s/veh	4.1	12.9	12.5	5.6	14.4	14.0		16.5		20.2	13.2	
Incremental Delay (*d 2*), s/veh	0.0	0.2	0.3	0.0	0.5	0.5		0.3		0.1	0.1	
Initial Queue Delay (*d 3*), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0		0.0	0.0	
Control Delay (*d*), s/veh	4.2	13.1	12.8	5.6	15.0	14.6		16.8		20.4	13.4	
Level of Service (LOS)	A	B	B	A	B	B		B		C	B	
Approach Delay, s/veh / LOS	11.7		B	14.1		B	16.8		B	15.4		B
Intersection Delay, s/veh / LOS	13.7						B					

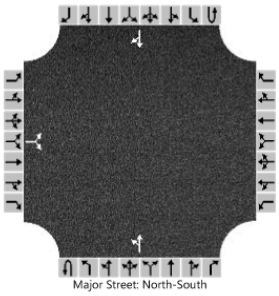
Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.67	B	1.90	B	2.26	B	2.26	B
Bicycle LOS Score / LOS	1.06	A	1.19	A	0.88	A	0.80	A

EXHIBIT 9
2019 WEEKDAY PEAK AM HOUR ANALYSIS – Industrial/Appleton Side

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst		Intersection	Appleton Side/Industrial
Agency/Co.		Jurisdiction	Lanark County
Date Performed	9/1/2020	East/West Street	Industrial Drive
Analysis Year	2019	North/South Street	Appleton Side Road
Time Analyzed	Peak AM Hour	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Mill Valley Living		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		2		1						4	76				75	10
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.43		6.23						4.13						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

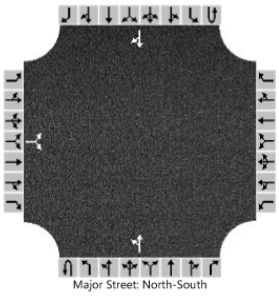
Flow Rate, v (veh/h)			3							4						
Capacity, c (veh/h)			854							1496						
v/c Ratio			0.00							0.00						
95% Queue Length, Q_{95} (veh)			0.0							0.0						
Control Delay (s/veh)			9.2							7.4						
Level of Service (LOS)			A							A						
Approach Delay (s/veh)	9.2								0.4							
Approach LOS	A															

EXHIBIT 10
2019 WEEKDAY PEAK PM HOUR ANALYSIS – Industrial/Appleton Side

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst		Intersection	Appleton Side/Industrial
Agency/Co.		Jurisdiction	Lanark County
Date Performed	9/1/2020	East/West Street	Industrial Drive
Analysis Year	2019	North/South Street	Appleton Side Road
Time Analyzed	Peak PM Hour	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Mill Valley Living		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		9		4						1	83				97	2
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.43		6.23						4.13						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			14							1						
Capacity, c (veh/h)			830							1477						
v/c Ratio			0.02							0.00						
95% Queue Length, Q_{95} (veh)			0.1							0.0						
Control Delay (s/veh)			9.4							7.4						
Level of Service (LOS)			A							A						
Approach Delay (s/veh)	9.4								0.1							
Approach LOS	A															

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EXHIBIT 11
2028 LEFT TURN LANE WARRANT ANALYSIS – Industrial/Appleton Side

TRAFFIC

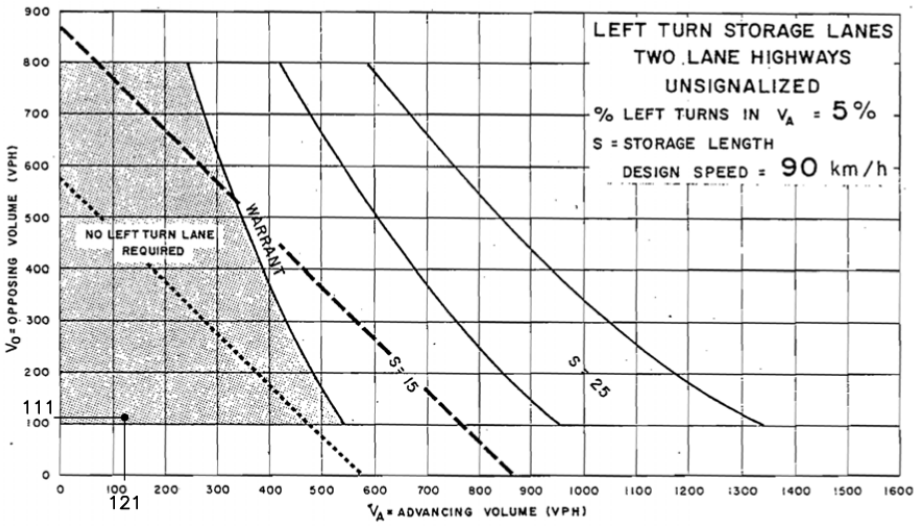
V_o = 111 vph
V_A = 121 vph
V_L = 4 vph

V_L / V_A = 3.31%

POSTED SPEED
80 km/h

WARRANT

NO LEFT TURN
LANE REQUIRED



NORTHBOUND LEFT
PEAK AM HOUR

TRAFFIC SIGNALS MAY BE WARRANTED IN RURAL AREAS OR URBAN AREAS WITH RESTRICTED FLOW

TRAFFIC SIGNALS MAY BE WARRANTED IN "FREE FLOW" URBAN AREAS

TRAFFIC

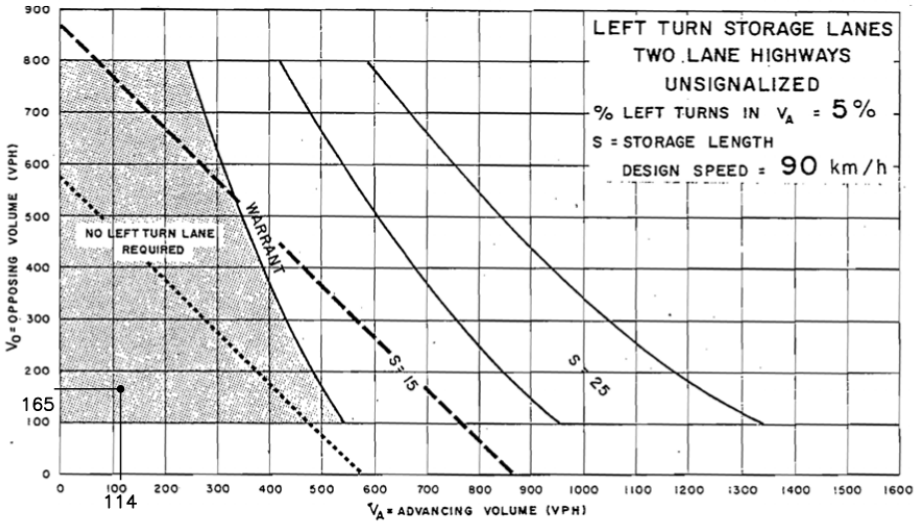
V_o = 165 vph
V_A = 114 vph
V_L = 2 vph

V_L / V_A = 1.75%

POSTED SPEED
80 km/h

WARRANT

NO LEFT TURN
LANE REQUIRED



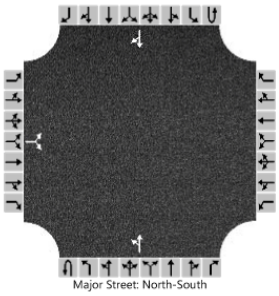
NORTHBOUND LEFT
PEAK PM HOUR

EXHIBIT 12
2023 WEEKDAY PEAK AM HOUR ANALYSIS – Industrial/Appleton Side

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst		Intersection	Appleton Side/Industrial
Agency/Co.		Jurisdiction	Lanark County
Date Performed	9/1/2020	East/West Street	Industrial Drive
Analysis Year	2023	North/South Street	Appleton Side Road
Time Analyzed	Peak AM Hour	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Mill Valley Living		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		21		1						4	113				89	17
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.43		6.23						4.13						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			24							4						
Capacity, c (veh/h)			753							1467						
v/c Ratio			0.03							0.00						
95% Queue Length, Q_{95} (veh)			0.1							0.0						
Control Delay (s/veh)			9.9							7.5						
Level of Service (LOS)			A							A						
Approach Delay (s/veh)	9.9								0.3							
Approach LOS	A															

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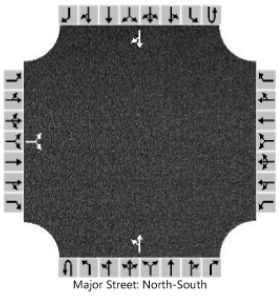
EXHIBIT 13
2023 WEEKDAY PEAK PM HOUR ANALYSIS – Industrial/Appleton Side

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst		Intersection	Appleton Side/Industrial
Agency/Co.		Jurisdiction	Lanark County
Date Performed	9/1/2020	East/West Street	Industrial Drive
Analysis Year	2023	North/South Street	Appleton Side Road
Time Analyzed	Peak PM Hour	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Mill Valley Living		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		23		5						2	107				137	23
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.43		6.23						4.13						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			30							2						
Capacity, c (veh/h)			731							1397						
v/c Ratio			0.04							0.00						
95% Queue Length, Q_{95} (veh)			0.1							0.0						
Control Delay (s/veh)			10.1							7.6						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	10.1								0.2							
Approach LOS	B															

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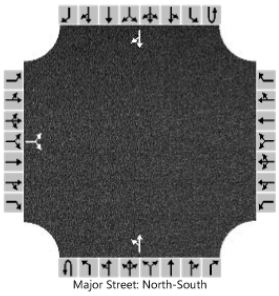
EXHIBIT 14
2028 WEEKDAY PEAK AM HOUR ANALYSIS – Industrial/Appleton Side

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst		Intersection	Appleton Side/Industrial
Agency/Co.		Jurisdiction	Lanark County
Date Performed	9/1/2020	East/West Street	Industrial Drive
Analysis Year	2028	North/South Street	Appleton Side Road
Time Analyzed	Peak AM Hour	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Mill Valley Living		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		21		2						4	117				93	18
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.43		6.23						4.13						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			25							4						
Capacity, c (veh/h)			751							1461						
v/c Ratio			0.03							0.00						
95% Queue Length, Q_{95} (veh)			0.1							0.0						
Control Delay (s/veh)			10.0							7.5						
Level of Service (LOS)			A							A						
Approach Delay (s/veh)	10.0								0.3							
Approach LOS	A															

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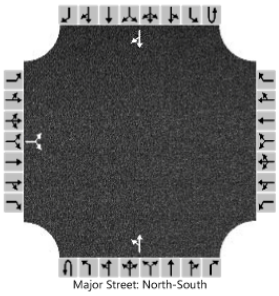
EXHIBIT 15
2028 WEEKDAY PEAK PM HOUR ANALYSIS – Industrial/Appleton Side

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst		Intersection	Appleton Side/Industrial
Agency/Co.		Jurisdiction	Lanark County
Date Performed	9/1/2020	East/West Street	Industrial Drive
Analysis Year	2028	North/South Street	Appleton Side Road
Time Analyzed	Peak PM Hour	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Mill Valley Living		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		24		5						2	112				142	23
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.43		6.23						4.13						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			32							2						
Capacity, c (veh/h)			720							1390						
v/c Ratio			0.04							0.00						
95% Queue Length, Q_{95} (veh)			0.1							0.0						
Control Delay (s/veh)			10.2							7.6						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	10.2								0.1							
Approach LOS	B															

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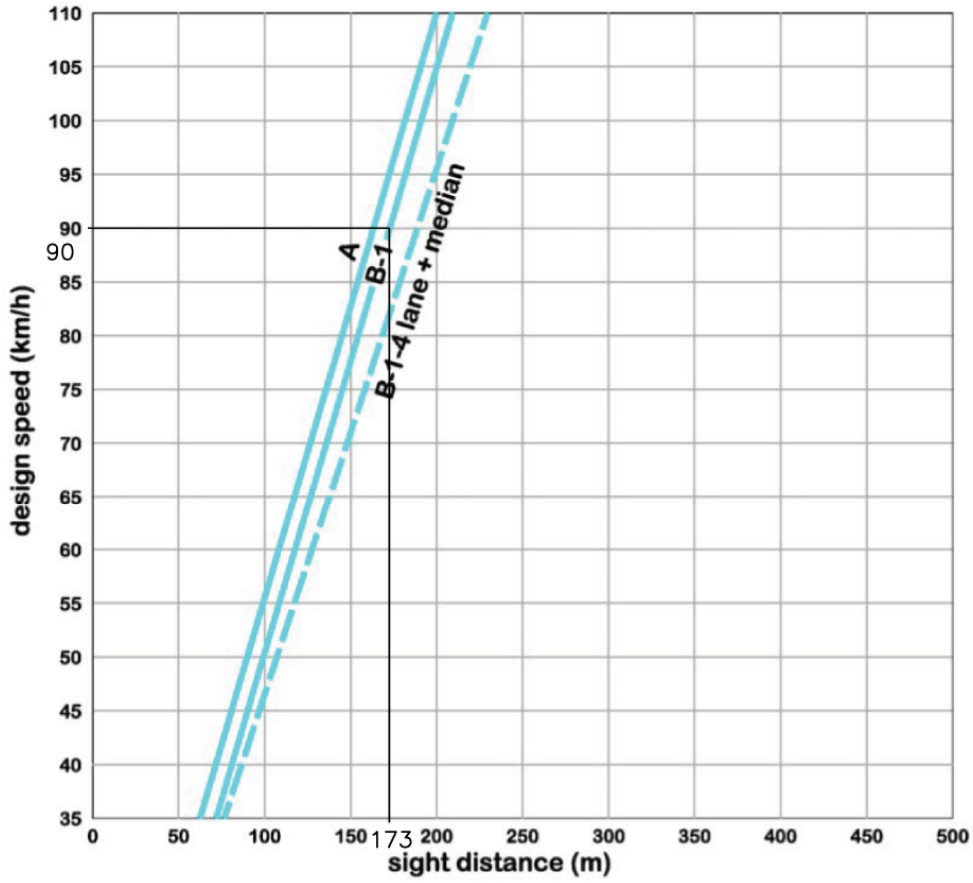
EXHIBIT 16
TURNING SIGHT DISTANCE (80 km./h. Posted Speed) – Industrial/Appleton Side

Figure 2.3.3.4a Sight Distance for Crossing Movements and Vehicles Turning Left across Passenger Vehicle approaching from the Left



A – sight distance for passenger vehicle crossing a two –lane roadway from stop.

B-1 – sight distance for passenger vehicle turning left onto a two-lane roadway across passenger vehicle approaching from the left.

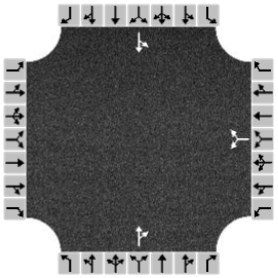
B-1-4 lane + median – sight distance for passenger vehicle turning left onto a four-lane roadway across passenger vehicle approaching from the left when median width is less than the vehicle length.

EXHIBIT 17
2028 WEEKDAY PEAK AM HOUR ANALYSIS – Industrial/Gerry Emon

HCS7 All-Way Stop Control Report

General Information		Site Information	
Analyst		Intersection	Industrial/Gerry Emon
Agency/Co.		Jurisdiction	Lanark County
Date Performed	7/27/2021	East/West Street	Industrial Drive
Analysis Year	2028	North/South Street	Gerry Emon Road
Analysis Time Period (hrs)	0.25	Peak Hour Factor	0.92
Time Analyzed	Peak AM Hour		
Project Description	Mill Valley Living		

Lanes



Vehicle Volume and Adjustments

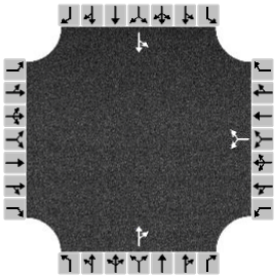
Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume				7		3		56	20	1	19	
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration				LR			TR			LT		
Flow Rate, v (veh/h)				11			83			22		
Percent Heavy Vehicles				3			3			3		
Departure Headway and Service Time												
Initial Departure Headway, hd (s)				3.20			3.20			3.20		
Initial Degree of Utilization, x				0.010			0.073			0.019		
Final Departure Headway, hd (s)				4.13			3.84			4.06		
Final Degree of Utilization, x				0.012			0.088			0.025		
Move-Up Time, m (s)				2.0			2.0			2.0		
Service Time, ts (s)				2.13			1.84			2.06		
Capacity, Delay and Level of Service												
Flow Rate, v (veh/h)				11			83			22		
Capacity				873			938			887		
95% Queue Length, Q_{95} (veh)				0.0			0.3			0.1		
Control Delay (s/veh)				7.2			7.2			7.2		
Level of Service, LOS				A			A			A		
Approach Delay (s/veh)				7.2			7.2			7.2		
Approach LOS				A			A			A		
Intersection Delay, s/veh | LOS	7.2						A					

EXHIBIT 18
2028 WEEKDAY PEAK PM HOUR ANALYSIS – Industrial/Gerry Emon

HCS7 All-Way Stop Control Report

General Information		Site Information	
Analyst		Intersection	Industrial/Gerry Emon
Agency/Co.		Jurisdiction	Lanark County
Date Performed	7/27/2021	East/West Street	Industrial Drive
Analysis Year	2028	North/South Street	Gerry Emon Road
Analysis Time Period (hrs)	0.25	Peak Hour Factor	0.92
Time Analyzed	Peak PM Hour		
Project Description	Mill Valley Living		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume				22		1		38	15	3	61	
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration				LR			TR			LT		
Flow Rate, v (veh/h)				25			58			70		
Percent Heavy Vehicles				3			3			3		
Departure Headway and Service Time												
Initial Departure Headway, hd (s)				3.20			3.20			3.20		
Initial Degree of Utilization, x				0.022			0.051			0.062		
Final Departure Headway, hd (s)				4.38			3.91			4.07		
Final Degree of Utilization, x				0.030			0.062			0.079		
Move-Up Time, m (s)				2.0			2.0			2.0		
Service Time, ts (s)				2.38			1.91			2.07		
Capacity, Delay and Level of Service												
Flow Rate, v (veh/h)				25			58			70		
Capacity				821			922			884		
95% Queue Length, Q_{95} (veh)				0.1			0.2			0.3		
Control Delay (s/veh)				7.5			7.2			7.4		
Level of Service, LOS				A			A			A		
Approach Delay (s/veh)				7.5			7.2			7.4		
Approach LOS				A			A			A		
Intersection Delay, s/veh | LOS	7.3						A					

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