

James J. Copeland, P.Eng., RSP1 GRIFFIN transportation group inc. 30 Bonny View Drive Fall River, NS B2T 1R2

September 16, 2024

Att: Julia Healey

Zwicker Zareski Architecture + Planning

1 Canal Street

Dartmouth, NS B2Y 2W1

RE: Traffic Impact Statement – Proposed development at Civic #1540 Prospect Road

1.0 INTRODUCTION

1.1 – Overview

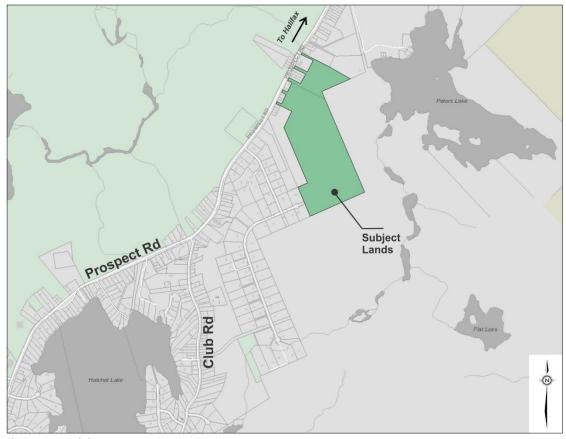
At the request of *Zwicker Zareski Architecture + Planning (ZZAP)*, the GRIFFIN transportation group inc. has carried out a qualitative Stage 1 - Traffic Impact Assessment in support of a Development Agreement (DA) application for a proposed new business at civic #1540, Lots E and H (PID #40841116 and #00656074). These lands are located on the east side of Prospect Road in the community of Hatchet Lake, Halifax Regional Municipality (HRM). The location of these lands is contained in *Figure 1*.

The existing Lots E and H are undeveloped and have a combined area of about 86.5 acres. They currently have a RB-1 (Residential B-1 Zone) land use zone designation within the *District 4 (Prospect) Land Use By-Law* area. Although the majority of the subject lands are vacant, there are two existing driveways that connect to Prospect Road. A description of the existing and proposed site driveways is provided later in this letter.

Through our discussions with ZZAP, it is understood that the proponent is submitting a planning application to HRM for approval to change how these lands will be used in the future. The landowner has plans to build a garage-style building that will be used to service and maintain construction equipment. The owners have indicated there will be 1 to 2 full time employees on site, plus the periodic movement of construction equipment to/from the property, as required for servicing and maintenance. In addition, a laydown area will be installed to accommodate the storage of construction materials to support the on-going business operations.



Figure 1: Location of Subject Lands



Source: HRM GIS Maps

1.2 – Terms of Reference

The qualitative traffic impact assessment associated with the proposed development is discussed in the following Sections. Throughout the completion of this study GRIFFIN has followed HRM traffic impact study guidelines for a new development located in a suburban area, as well as Institute of Transportation Engineers (ITE), and Transportation Association of Canada (TAC) guiding principles.

2.0 STUDY AREA AND SITE CONTEXT

2.1 – Road Layout Overview

Prospect Road – also known as Route 333 in the Province's provincial road network – is a suburban arterial road with a two-lane, two-way rural cross-section including paved shoulders and open ditches. It has a curvilinear alignment and is generally aligned in a north-south direction. This road provides access to individual residences and businesses, as well as serving as a commuter corridor to move people to/from the employment areas in Halifax.



2.2 - Existing Traffic Volume Review

GRIFFIN installed an automatic traffic recording (ATR) device on Prospect Road to record the existing vehicle demand and operating speeds traveling in both directions. The ATR unit was placed immediately south of civic #1568 in order to gather relevant data in the vicinity of the new site driveway. The ATR unit recorded weekday vehicle information for more than 24 hours between August 27th and 29th, 2024. A summary of the observed August 2024 weekday peak hour volumes is contained in *Table 1*.

Table 1: Peak Hour Traffic Volumes on Prospect Road - August 2024

	Northbound (toward Halifax)	Southbound (toward Peggys Cove)	Two-way Peak Hour Volumes
Highest Volume - Weekday AM Peak Hour	746	244	990 vph
Highest Volume - Weekday PM Peak Hour	457	848	1,305 vph

vph - vehicles per hour

The highest hour of traffic flow occurred during the weekday afternoon commuter peak. At this time of day, the two-way peak hour volumes traveling along Prospect Road in the vicinity of the subject lands was observed to be about 1,305 vehicles/hour (vph). The ATR quantified an average daily volume which was estimated to be 13,580 vehicles/day; however, this does not take into account daily weekend volumes which tend to be lower. Thus, the average daily volume is expected to be lower than this value, likely in the vicinity of 12,500 to 13,000 vpd

GRIFFIN reviewed the Transportation Association of Canada (TAC) Geometric Design Guidelines to help put the observed vehicle demand on Prospect Road into perspective. Although TAC does not provide guidance with respect to the absolute maximum capacity of roads, they provide typical volumes expected for several roadway classification types. The latest TAC geometric design guidelines suggest that rural arterial roads typically accommodate up to 12,000 vpd. Again, these are guidelines for typical volumes and the maximum capacity values would be higher.

In conclusion, the observed weekday demand of about 12,500-13,000 vpd is a typical volume expected along a rural arterial road. This suggests there is room for some traffic growth before the maximum capacity is reached in the Prospect Road corridor.

2.3 - Vehicle Operating Speeds

As noted above, the installed ATR unit also gathered vehicle operating speeds on Prospect Road in the vicinity of the property frontage. The 85th percentile vehicle operating speed recorded by the ATR unit was calculated to be 80 km/h in the southbound direction, and 86 km/h in the



northbound direction. As such, 80 km/h was chosen as the design speed for the sight distance assessment discussed later in this letter.

The 85th percentile vehicle operating speeds are higher than the regulatory 70 km/h speed limit.

3.0 THE PROPOSED CHANGES

3.1 - Overview

Discussions were held with ZZAP to understand the proposed business operations that will occur at civic #1540 and identify a reasonable estimate of vehicle trips that are expected to move in and out of the site driveway. It was indicated that a new garage building would be constructed and this new space would be used by the owners to carry out construction equipment repairs, maintenance, and servicing. In addition, the business operations will include a laydown area for the storage of construction materials to support their on-going day-to-day project work.

Generally, the proposed business operations are relatively small. Thus, the majority of land area within the boundaries of the subject properties will remain undeveloped and unused. *Figure 2* shows the approximate location of the new building, the construction material laydown area, as well as the location of the proposed new driveway.

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Figure 2: Proposed Site Plan

Source: ZZAP



3.2 – Proposed Changes to the Site Accesses

Currently, there are two existing vehicle driveways connecting to Prospect Road that serve Lots E and H, including:

- 1. An existing north driveway that connects via a narrow piece of frontage located at the north boundary of civic #1536.
- 2. An existing south driveway that connects via a narrow piece of frontage located at the south boundary of civic #1600.

Since there is no development on site, it is understood that these two driveways are not used on a regular basis.

Under the proposed scenario, the two existing driveways will be closed to vehicle traffic and a new central driveway will be constructed. As shown in *Figure 2*, this new vehicle access will be located immediately north of civic #1568 and will connect along a flat tangent segment of Prospect Road. The width of the property frontage along Prospect Road in this location is 20 m. It should be noted that a utility pole and concrete culvert extending across Prospect Road both appear to be situated in close proximity to the proposed new access and should be considered in any future driveway design.

3.3 – Visibility at the New Driveway

Typically, a driver sight distance review is completed as part of the traffic impact assessment process to identify any driver sight distance or visibility limitations up and downstream of a new site access. GRIFFIN carried out the visibility review process following the latest Transportation Association of Canada's (TAC) *Geometric Design Guide for Canadian Roads* document (2017) as well as the Nova Scotia Department of Public Work's field measurement best practices.

At this early planning stage, GRIFFIN only assessed the minimum requirement for vehicles approaching the new access which is referred to as stopping sight distance (SSD). The provision of adequate SSD for vehicles traveling on the main roadway ensures drivers have sufficient forward visibility to identify a hazard in the roadway, and if needed, bring their vehicle to a stop.

GRIFFIN completed the field measurements using a hazard object height of 0.6m and a driver eye height of 1.05m. The available sight distance measurements were recorded in the vicinity of the proposed new driveway, between civics #1562 and #1568, to identify any potential visibility constraints. A summary of the SSD assessment is provided in *Table 2* which only shows the results for an assumed driveway location at about the mid-point of the new property frontage.

GRIFFIN concluded that the available driver visibility along Prospect Road exceeds minimum TAC requirements for an 80 km/h operating speed. The driver visibility observed during the field review is provided in *Figures 3 and 4*.



Table 2: Summary of Stopping Sight Distance Measurements – At Proposed Access (80 km/h)

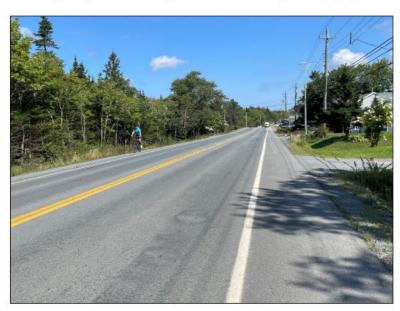
Measurement	Travel	Available	TAC Red	quired SSD	Does Available
Location	Direction	SSD	Base ^A	Slope Adjusted	Exceed Required?
1. New Access (centre of new frontage)	Northbound (toward Halifax)	286 m	130 m	130 m (2%) ^B	YES
	Southbound (toward Peggys Cove)	210 m		130 m (<2%) ^B	YES

A – 2017 TAC Chapter 2, Table 2.5.2

Figure 3: Driver Views Along Prospect Road at Proposed Access – Looking South (Left)



Figure 4: Driver Views Along Prospect Road at Proposed Access - Looking North (Right)



 $^{{\}it B-An}$ estimate of the actual slope along Prospect Road on the approaches to the new access.



4.0 VEHICLE TRIP GENERATION

4.1 - New Vehicle Trips

In order to assess the change in traffic volumes on the study area roads under future conditions, there was a need to determine the expected number of new vehicles that would be added to the study area roads and intersections, explicitly associated with the proposed development. This is referred to as the trip generation calculation process. Typically, traffic engineers use trip generation rates published by the Institute of Transportation Engineers (ITE) to forecast site-generated volumes for specific land use types, if deemed appropriate.

As noted earlier in this letter, the proponent has plans to build a new garage-style building to accommodate construction equipment repair and servicing, as well as a construction material storage / laydown area to support their on-going project work. It is understood there will only be up to 2 employees on site at any given time. Thus, the proposed business is somewhat different than a traditional vehicle repair business. Given this situation, GRIFFIN has elected to use a first principles approach to quantifying the new traffic moving in/out of the new driveway. Our assumptions and calculations are contained in *Table 3*.

Table 3: Vehicle Trip Generation for the Proposed Development

		Trip	New '	Vehicle Trips /	Hour
	Size / Scale	Rate	In	Out	Total
AM Peak Hour					
Employee Vehicle Trips	2 employees	1.0 / emp ^A	2 (100%)	0 (0%)	2
Equipment Moving In/Out	2 repairs	2.0 / equip ^B	2 (50%)	2 (50%)	4
Construction Materials In/Out		4.0 / hour	2 (50%)	2 (50%)	4
Service / Delivery Vehicles	1 delivery	2.0 / delivery	1 (50%)	1 (50%)	2
PM Peak Hour	AN	1 Peak Total Trips	7	5	12
Employee Vehicle Trips	2 employees	1.0 / emp ^A	0 (0%)	2 (100%)	2
Equipment Moving In/Out	2 repairs	2.0 / equip ^B	2 (50%)	2 (50%)	4
Construction Materials In/Out		4.0 / hour	2 (50%)	2 (50%)	4
Service / Delivery Vehicles	1 delivery	2.0 / delivery	1 (50%)	1 (50%)	2
	PM	1 Peak Total Trips	5	7	12

A – Assume one employee drives to work, the other is dropped off.

Based on the results contained in *Table 3*, the proposed business operation is expected to generate the following peak hour trips:

- Weekday AM Peak Hour: 12 new vehicle trips/hour (7 inbound and 5 outbound)
- Weekday PM Peak Hour: 12 new vehicle trips/hour (5 inbound and 7 outbound)

Traffic Impact Statement

B – Assume that pieces of equipment are transported to/from the site using a truck/trailer.



This generally equates to adding one new vehicle trip every 5 minutes to the study area roads. We previously concluded Prospect Road has some residual capacity that can accommodate traffic growth – including small increases of one new trip every 5 minutes during peak times of the day. Given the relatively low traffic demand generated by the proposed business operations, there is not expected to be any measurable change in operations along Prospect Road.

4.2 – Expected Distribution of New Trips

The highest concentration of new vehicle trips generated by the proposed development will occur on Prospect Road – in the vicinity of the new access. However, as stated above, the addition of one new vehicle trip every 5 minutes is expected to have little to no impact.

GRIFFIN also carried out a qualitative assessment of the expected travel direction for new vehicle trips and concluded the following:

- To/From the North (Halifax): We expect the majority of new vehicle trips estimated to be about 80% will move to/from the Halifax direction. This assumption is based on the fact the majority of the Region's population and employment including businesses and construction activity is located in this direction.
- To/from the South (Peggy's Cove): All remaining vehicle trips are expected to move to/from the south; however, the number of trips will be much lower than the volume expected to be moving to/from the north.

In summary, the majority of trips are expected to move to/from the north toward Halifax.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 - Conclusions

The following conclusions were gleaned from the qualitative traffic impact assessment of the proposed development:

- Proposed Changes: The proponent currently owns a construction business and has plans to use civic #1540 Prospect Road (Lots E and H) to support this existing business. It is understood they will construct a new garage-style building to service and maintain construction equipment, as well as the installation of a laydown area to accommodate the storage of construction materials. The majority of the land area will remain undeveloped and vacant. The two existing driveways will be closed and a new central driveway will connect to Prospect Road via the 20m wide frontage immediately north of civic #1568.
- New Vehicle Traffic: The trip generation calculations were carried out using a first
 principles approach to account for site-specific vehicle trips moving in/out of the site
 during the typical weekday peak hours. GRIFFIN has estimated that the proposed business



- operations are expected to generate up to 12 trips/hour (7 inbound and 5 outbound) during the weekday morning peak period, and 12 trips/hour (5 inbound and 7 outbound) during the weekday afternoon peak period.
- Traffic Operational Impacts: GRIFFIN expects there will be no measurable traffic
 operational impact on the study area roads and intersections associated with the opening
 of the proposed business. This conclusion is based on the fact there is some amount of
 residual capacity in the Prospect Road corridor, and the proposed development will only
 generate a very small number of new vehicle trips during peak travel periods.
- Visibility at New Driveway: The available stopping sight distance (SSD) measured along Prospect Road appears to exceed TAC minimum requirements for the measured 85th percentile operating speed. This suggests the proposed new driveway location between civics #1562 and #1568 is a suitable location that exceeds TAC's visibility requirements.

5.2 – Recommendations

Based on the findings of this qualitative review the following steps are recommended:

- Access Design: That the geometric design of the proposed vehicle access serving the new
 business operations follows the latest Transportation Association of Canada (TAC) and
 HRM design guidelines contained in the most recent edition of their Municipal Design
 Guidelines document. This includes the accommodation of an appropriate truck design
 vehicle (i.e. garbage truck or emergency vehicle). One inbound and one outbound lane will
 provide sufficient capacity. Due to the very low volume of peak hour trips turning in/out
 of the site, no auxiliary turn lanes will be required on Prospect Road.
- Closure of Existing Accesses: Once the proposed site driveway is constructed and open to traffic, the two existing driveways are recommended to be closed. The proposed business operations will require only one driveway connection, and this approach follows good access management principles.
- By-Law Requirements: That the municipal By-laws/Policy requirements for corner clearance, sight triangles, and driver visibility are met to ensure acceptable traffic operations are maintained throughout the planning, design, and construction phases of the project.
- Signs and Pavement Markings: Should any new or changed signs and/or pavement
 markings be installed, that they follow the latest guidelines contained in TAC's Manual of
 Uniform Traffic Control Devices for Canada (MUTCDC) document. Further, the proponent
 should work with HRM during the detailed design stage to identify the frequency of large
 truck trips moving in/out of the site and determine the need for "Trucks Entering" warning
 signs along Prospect Road in advance of the new driveway location.



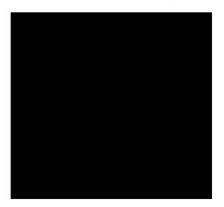
6.0 CLOSING

The findings flowing from this qualitative traffic impact statement suggest the new vehicle trips generated by the proposed new business on Prospect Road is expected to have little to no impact on the traffic operational performance of the study area roads and intersections. I would be happy to provide you with additional information or clarification regarding these matters and can be reached anytime by phone at (902) 266-9436 or by email at jcopeland@griffininc.ca.

Sincerely,



Managing Principal – Traffic & Road Safety Engineer GRIFFIN transportation group inc.





APPENDIX

Prospect Road
Traffic Volumes & Speeds
August 2024

For Project: Hatchet Lake Aug 2024
Project Notes: 1568 Prospect Rd
Location/Name: Northbound (incoming)

Report Generated: 8/29/2024 12:45:31 PM

Speed Intervals 1 km/h
Time Intervals Instant

Traffic Report From 8/27/2024 11:00:00 AM through 8/29/2024 11:59:59 AM

85th Percentile Speed 86 km/h 85th Percentile Vehicles 12097

Max Speed 131 km/h on 8/28/2024 5:10:15 AM

Total Vehicles 14232 AADT: 6970

Volumes -

weekly counts

	Time	5 Day	7 Day	
Average Daily		4744	4744	
AM Peak	7:00 AM	728	728	
PM Peak	12:00 PM	491	491	

Speed

Speed Limit:7085th Percentile Speed:8650th Percentile Speed:79

10 km/h Pace Interval: 73.0 km/h to 83.0 km/h

Average Speed: 78.5

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Count over limit	N/A	3455	6238	2962	N/A	N/A	N/A
% over limit	N/A	88.2	89.2	89.1	N/A	N/A	N/A
Avg Speeder	N/A	79.9	80.2	80.7	N/A	N/A	N/A
Avg Speed	N/A	78.1	78.5	79.0	N/A	N/A	N/A

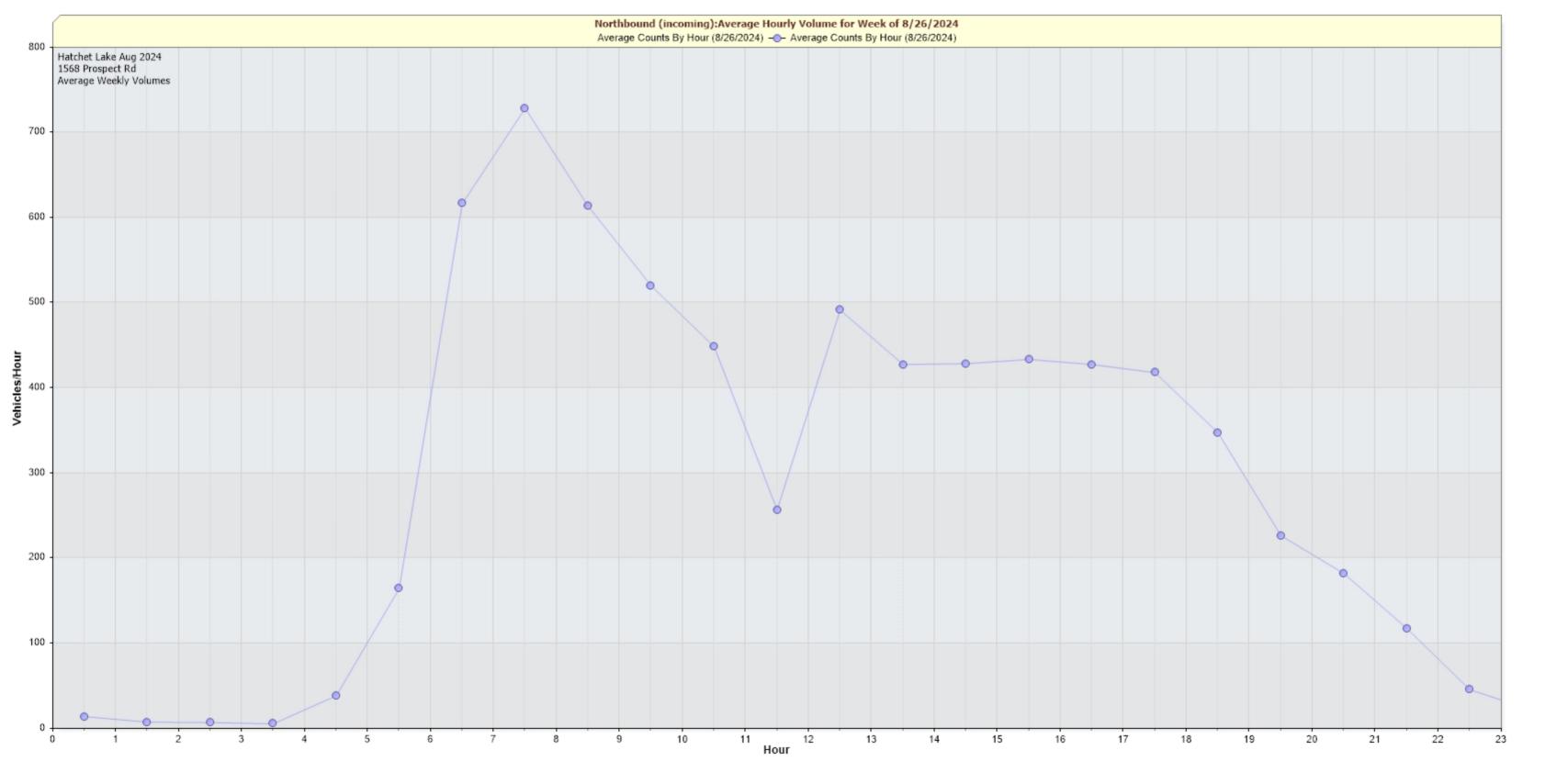
Class Counts

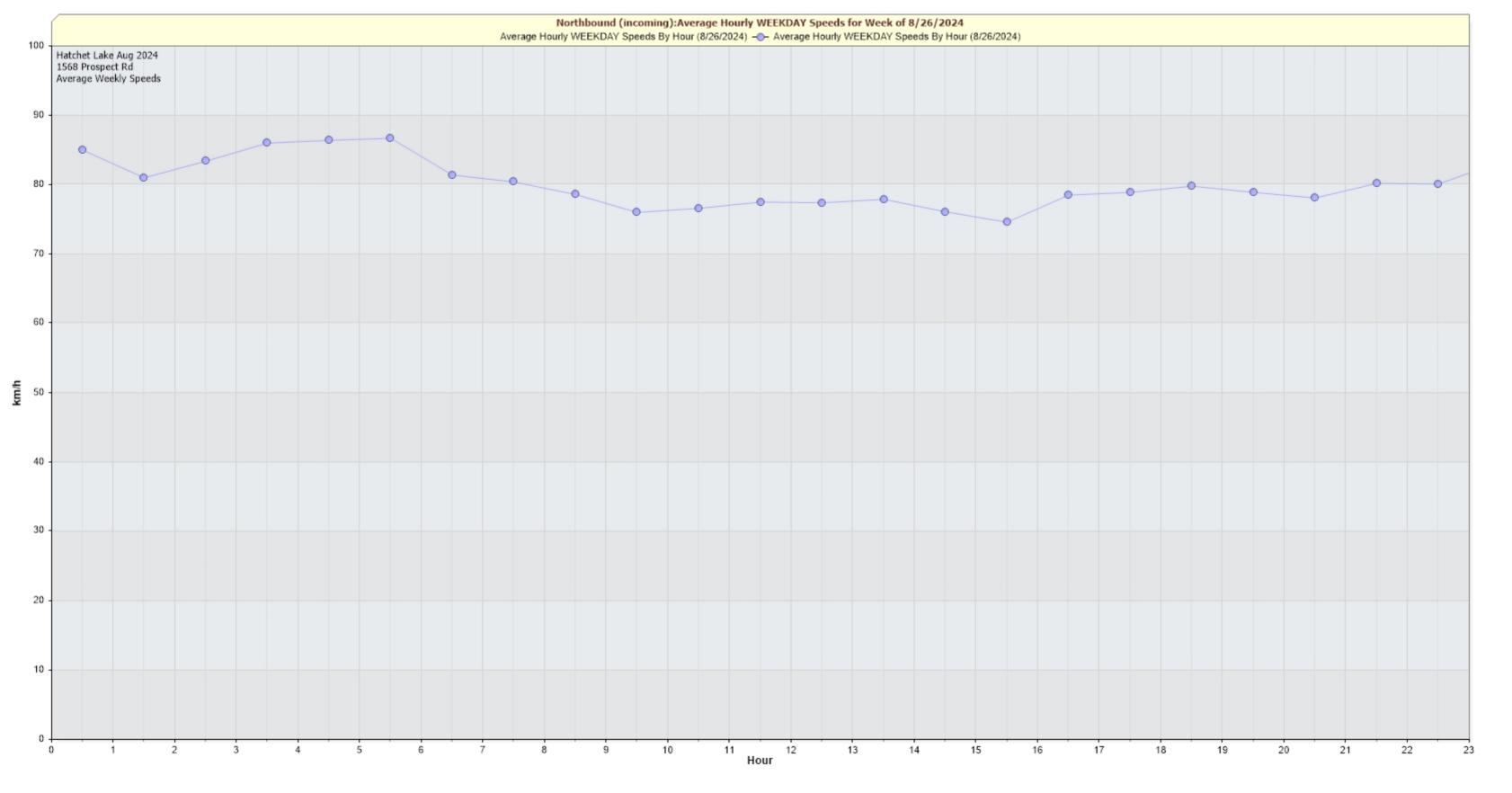
	Number	%
VEH_SM	3	0
VEH_MED	13663	96
VEH LG	566	4

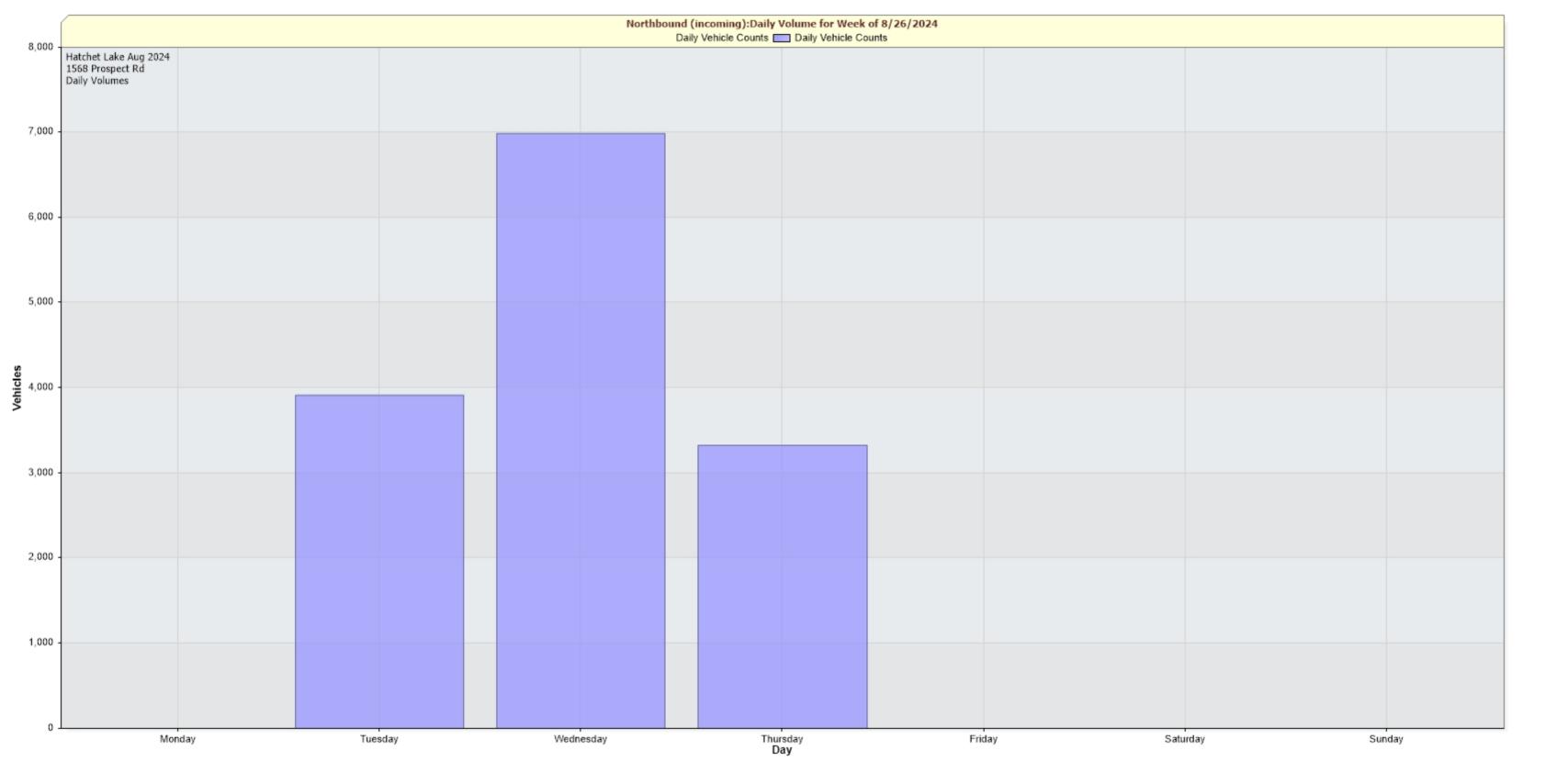
[VEH_SM=motorcycle, VEH_MED = sedan, VEH_LG = truck]

	8/26/2024	to	9/1/2024							
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Week	Weekend	Week Day 85%
Hour	8/26/2024	8/27/2024	8/28/2024	8/29/2024	8/30/2024	8/31/2024	9/1/2024	Day Avg	Avg	Avg Speed
0 - 1	*	*	11	17	*	*	*	14	0	88.65
1 - 2	*	*	10	5	*	*	*	7.5	0	85.5
2 - 3	*	*	3	11	*	*	*	7	0	89.5
3 - 4	*	*	5	6	*	*	*	5.5	0	97.5
4 - 5	*	*	44	33	*	*	*	38.5	0	97.5
5 - 6	*	*	175	154	*	*	*	164.5	0	94.65
6 - 7	*	*	628	605	*	*	*	616.5	0	86.45
7 - 8	*	*	746	711	*	*	*	728.5	0	85.85
8 - 9	*	*	594	633	*	*	*	613.5	0	84
9 - 10	*	*	469	571	*	*	*	520	0	82.7
10 - 11	*	*	468	429	*	*	*	448.5	0	82.4
11 - 12	*	178	441	151	*	*	*	256.67	0	83.4
12 - 13	*	461	522	*	*	*	*	491.5	0	83.25
13 - 14	*	458	397	*	*	*	*	427.5	0	85.15
14 - 15	*	430	427	*	*	*	*	428.5	0	82.75
15 - 16	*	414	453	*	*	*	*	433.5	0	82.15
16 - 17	*	457	398	*	*	*	*	427.5	0	85.5
17 - 18	*	456	380	*	*	*	*	418	0	85.05
18 - 19	*	401	294	*	*	*	*	347.5	0	86.15
19 - 20	*	253	200	*	*	*	*	226.5	0	85.75
20 - 21	*	220	144	*	*	*	*	182	0	84.35
21 - 22	*	133	102	*	*	*	*	117.5	0	87.15
22 - 23	*	38	53	*	*	*	*	45.5	0	88.25
23 - 24	*	17	26	*	*	*	*	21.5	0	90
Totals	0	3916	6990	3326	0	0	0			
% of Total	0%	27.52%	49.11%	23.37%	0%	0%	0%			

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For Project:	Hatchet Lake Aug 2024
Project Notes:	1568 Prospect Rd
ocation/Name:	Southbound (outgoing)
Penort Generated:	8/20/2024

Report Generated: 8/29/2024 12:45:31 PM

Speed Intervals 1 km/h
Time Intervals Instant

Traffic Report From 8/27/2024 11:00:00 AM through 8/29/2024 11:59:59 AM

85th Percentile Speed 80 km/h 85th Percentile Vehicles 11472

Max Speed 125 km/h on 8/28/2024 3:53:46 PM

Total Vehicles 13497 AADT: 6610

Volumes -

weekly counts

	Time	5 Day	7 Day	
Average Daily		4499	4499	
AM Peak	10:00 AM	374	374	
PM Peak	4:00 PM	800	800	

Speed

Speed Limit:7085th Percentile Speed:8050th Percentile Speed:73

10 km/h Pace Interval: 68.0 km/h to 78.0 km/h

Average Speed: 73.31

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Count over limit	N/A	3898	4475	1056	N/A	N/A	N/A
% over limit	N/A	71.5	67.7	73.9	N/A	N/A	N/A
Avg Speeder	N/A	76.7	76.4	78.0	N/A	N/A	N/A
Avg Speed	N/A	73.4	72.9	75.0	N/A	N/A	N/A

Class Counts

	Number	%
VEH_SM	1	0
VEH_MED	12966	96.1
VEH_LG	530	3.9

[VEH_SM=motorcycle, VEH_MED = sedan, VEH_LG = truck]

	8/26/2024	to	9/1/2024							
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Week	Weekend	Week Day 85%
Hour	8/26/2024	8/27/2024	8/28/2024	8/29/2024	8/30/2024	8/31/2024	9/1/2024	Day Avg	Avg	Avg Speed
0 - 1	*	*	43	31	*	*	*	37	0	88
1 - 2	*	*	11	19	*	*	*	15	0	89.75
2 - 3	*	*	7	12	*	*	*	9.5	0	79.5
3 - 4	*	*	13	5	*	*	*	9	0	88
4 - 5	*	*	11	4	*	*	*	7.5	0	81
5 - 6	*	*	25	20	*	*	*	22.5	0	88.5
6 - 7	*	*	89	77	*	*	*	83	0	85.75
7 - 8	*	*	183	173	*	*	*	178	0	82.25
8 - 9	*	*	236	244	*	*	*	240	0	81.5
9 - 10	*	*	260	302	*	*	*	281	0	79.35
10 - 11	*	*	358	391	*	*	*	374.5	0	79.7
11 - 12	*	141	411	150	*	*	*	234	0	78.47
12 - 13	*	486	474	*	*	*	*	480	0	78.65
13 - 14	*	489	445	*	*	*	*	467	0	78.5
14 - 15	*	473	527	*	*	*	*	500	0	77.9
15 - 16	*	670	625	*	*	*	*	647.5	0	77.65
16 - 17	*	848	752	*	*	*	*	800	0	77.45
17 - 18	*	726	687	*	*	*	*	706.5	0	77.9
18 - 19	*	505	460	*	*	*	*	482.5	0	79.95
19 - 20	*	372	336	*	*	*	*	354	0	80.85
20 - 21	*	350	289	*	*	*	*	319.5	0	78.45
21 - 22	*	225	181	*	*	*	*	203	0	81.05
22 - 23	*	109	124	*	*	*	*	116.5	0	84.7
23 - 24	*	61	67	*	*	*	*	64	0	89.75
Totals	0	5455	6614	1428	0	0	0			
% of Total	0%	40.42%	49%	10.58%	0%	0%	0%			

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