

Date: January 16, 2025

Our File No: 9393-01

RDCK File Number: #Z2410F

BY EMAIL

Ben Hall, Partner
Spearhead
4655 Hwy 3A
Nelson, BC
V1L 6N3

Dear Mr. Hall:

Re: Spearhead Industrial Rezoning, Nelson, BC – Access Study Proposal

Creative Transportation Solutions Ltd. (CTS) is pleased to submit this **FINAL** report summarising our work on the above study. CTS was retained by Spearhead to undertake an Access Study for the proposed industrial expansion at 4655 Highway 3A in Nelson, BC. The primary objectives of this study were as follows:

1. To conduct data collection and analysis to support the approval of the proposed industrial expansion;
2. To prepare a report that documents the technical analysis, key findings and recommendations to meet the requirements as set out by the Regional District of Central Kootenay, and the Ministry of Transportation and Infrastructure.

This report documents our analyses and findings.

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1.0 BACKGROUND

1.1 The Site

Spearhead is proposing an expansion to their existing manufacturing facility to include additional manufacturing and office space as well as a day care centre for employees at 4655 Highway 3A in Nelson, BC.

Access to the development will be located to the south of the development along Highway 3A.

The study area and the existing roadways are illustrated in **FIGURE 1**.

FIGURE 1
STUDY AREA AND INTERSECTIONS



1.2 Existing Road Network

The following is a summary of the existing road network:

Highway 3A

- Highway 3A is a two-lane highway with a posted speed limit of 80 km/h
- No on-street parking
- There are painted shoulders that can be used for pedestrians and cyclists
- The road is only illuminated at specific locations
- Rural cross section, shoulders with run-off

1.3 Alternative Modes of Travel

Transit Network

There are bus stops within a walking distance of 400 metres from the site and therefore this site could be considered transit accessible if there is a pedestrian network from the site to the bus stops. The closest bus stops are located along Crescent Road. The closest bus routes to the site are listed below.

- Route #10 North Shore: Service for this bus runs 6-7 times per day, approximately every 1-1.5 hours during peak periods. The majority of service is with a community bus.

Bus stops are illustrated in **FIGURE 2**.

Bicycle Network

There are no dedicated bike routes but there are shoulders on both sides of the road.

The existing bicycle network within the study area is illustrated in **FIGURE 2**.

Pedestrian Network

There are no sidewalks surrounding the site but there are shoulders on both sides of the road.

The existing sidewalks within the study area are illustrated in **FIGURE 2**.

**FIGURE 2
ALTERNATIVE MODES**



1.4 Scope of Work

The weekday morning and afternoon peak hours were selected as the design hours of analysis for this study.

The following scenarios were used in this traffic impact assessment:

1. 2024 (existing base)
2. 2026 (future base)
3. 2026 (future base + traffic from the proposed development)

2.0 TRAFFIC VOLUMES

2.1 Current Road Network

2024 Base Traffic Volumes

CTS conducted turning movement counts on Thursday, November 21, 2024 from 06:00 to 09:00 and 15:00 to 18:00 to document the typical weekday morning and afternoon peak hour traffic volumes for the study intersections. The study intersections included:

- Site Access & Highway 3A

The traffic count data was summarized and reviewed to ensure data integrity and validity. The summarized traffic data sheets are included in **APPENDIX A**.

The following peak hours were selected, based on the peak hours observed by the study intersections:

- Weekday Morning Peak Hour – 07:45 – 08:45
- Weekday Afternoon Peak Hour – 16:15 – 17:15

The Active-Permanent Core MoTI count station “Harrop P-31-3EW-NY” is directly adjacent to the count location. After review it was found that the peak traffic volumes along Highway 3A occur during the months of July and August. Monthly average traffic volumes for the previous 10 years were compiled to compare November volumes to July and August volumes to calculate an adjustment factor to apply to the base counted volumes so as to represent the peak volumes expected at the site location. **TABLE 1** below summarizes the collected data, and an adjustment factor of 1.72 was chosen to be applied to the base counted volumes. Volumes from 2020 to 2022 were not included due to changes to vehicle traffic during the covid pandemic.

TABLE 1
PERMANENT COUNT STATION DATA

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Average
July MADT	3786	4062	4191	4315	4255	4302	4080	4291	4241	4265	
Aug MADT	4056	4165	4347	4391	4269	4391	4308	4023	4221	-	
Nov MADT	2301	2440	2540	2536	2518	2577	2499	-	2464	2648	
July %	64.5%	66.5%	65.0%	70.1%	69.0%	66.9%	63.3%	-	72.1%	61.1%	67%
Aug %	76.3%	70.7%	71.1%	73.1%	69.5%	70.4%	72.4%	-	71.3%	-	72%

The unfactored 2024 base traffic volumes for the weekday morning and weekday afternoon peak hours are illustrated in **FIGURE 3** and **FIGURE 4**, respectively. The factored 2024 base traffic volumes for the weekday morning and weekday afternoon peak hours are illustrated in **FIGURE 5** and **FIGURE 6**, respectively.

FIGURE 3
UNFACTORED 2024 WEEKDAY MORNING PEAK HOUR BASE TRAFFIC VOLUMES

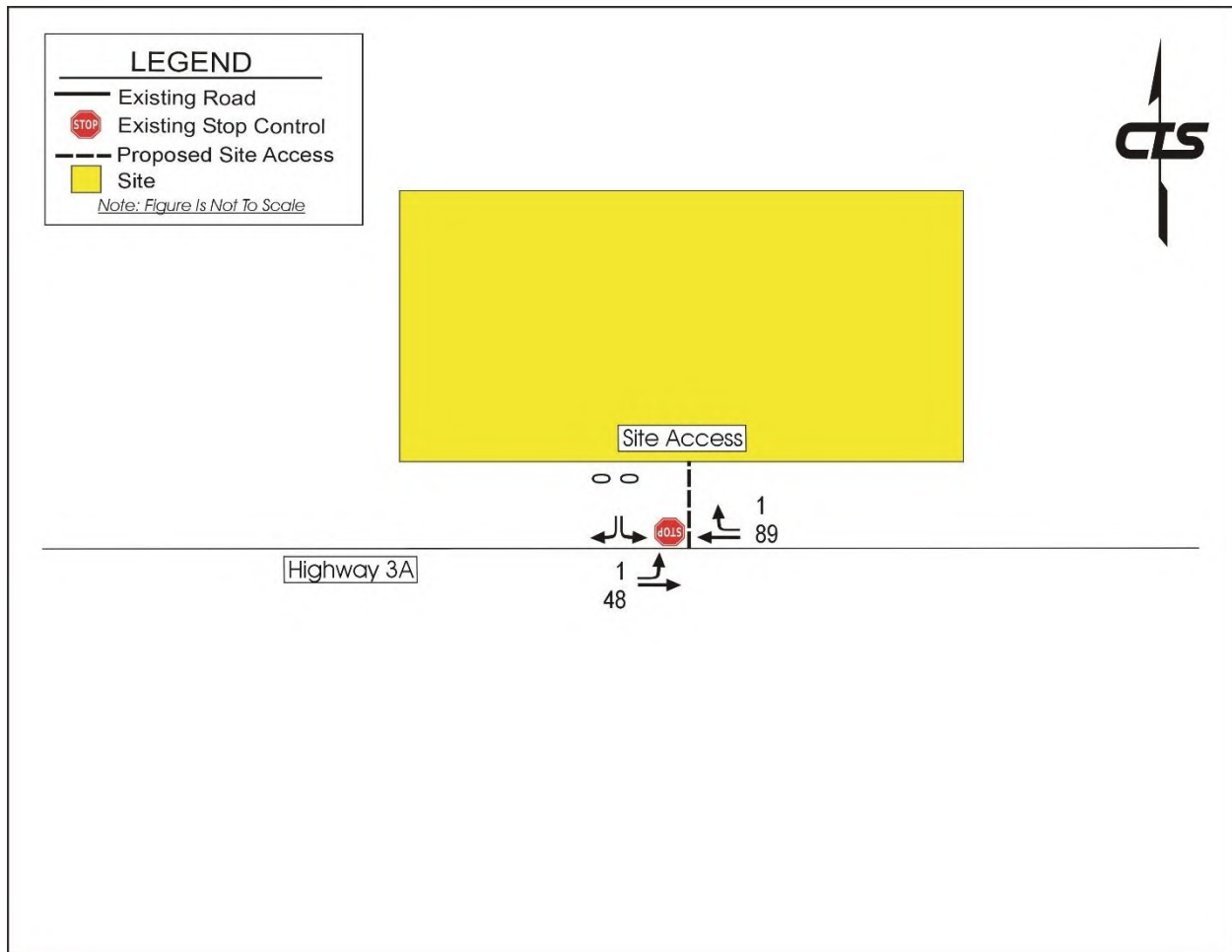


FIGURE 4
UNFACTORED 2024 WEEKDAY AFTERNOON PEAK HOUR BASE TRAFFIC VOLUMES

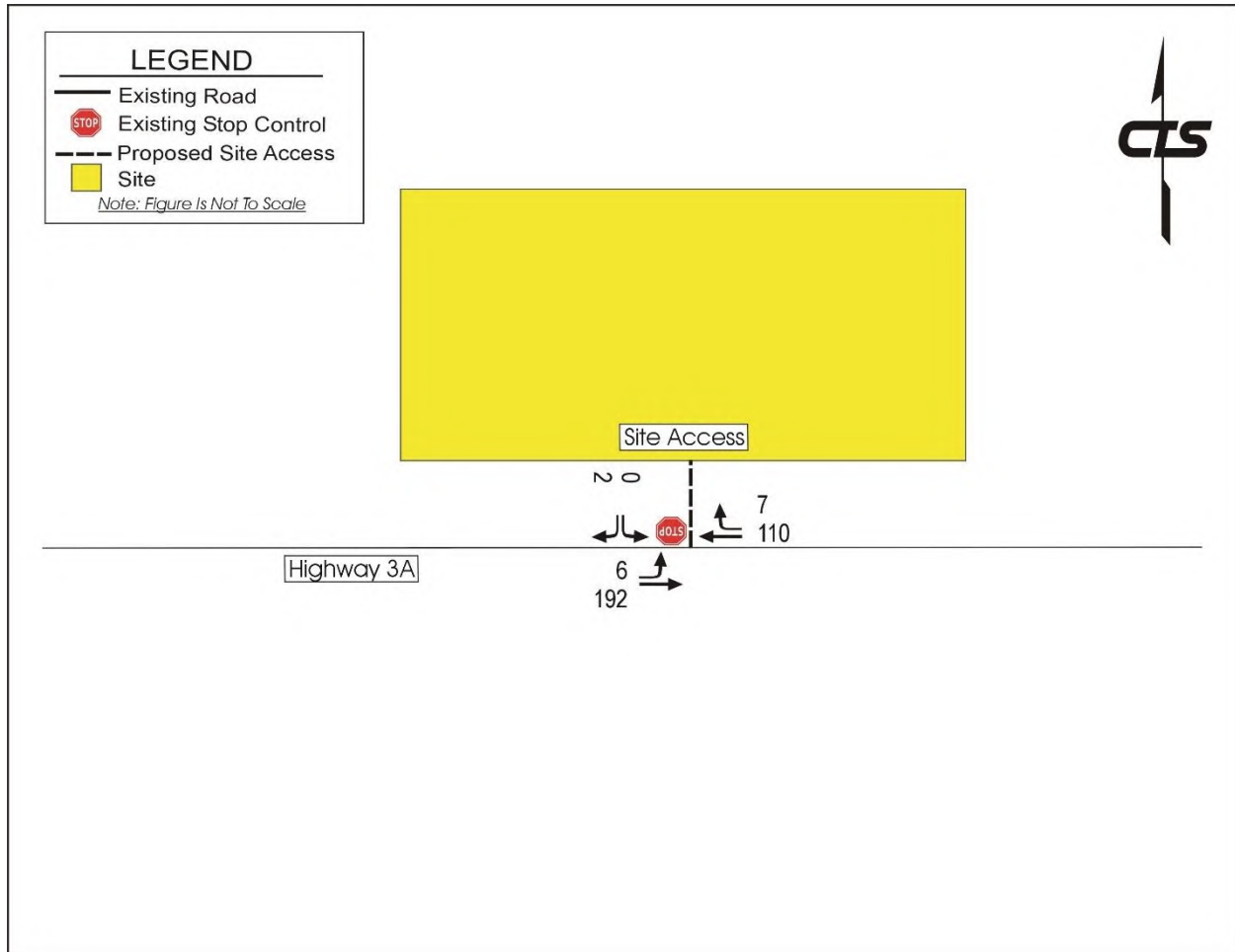


FIGURE 5
FACTORED 2024 WEEKDAY MORNING PEAK HOUR BASE TRAFFIC VOLUMES

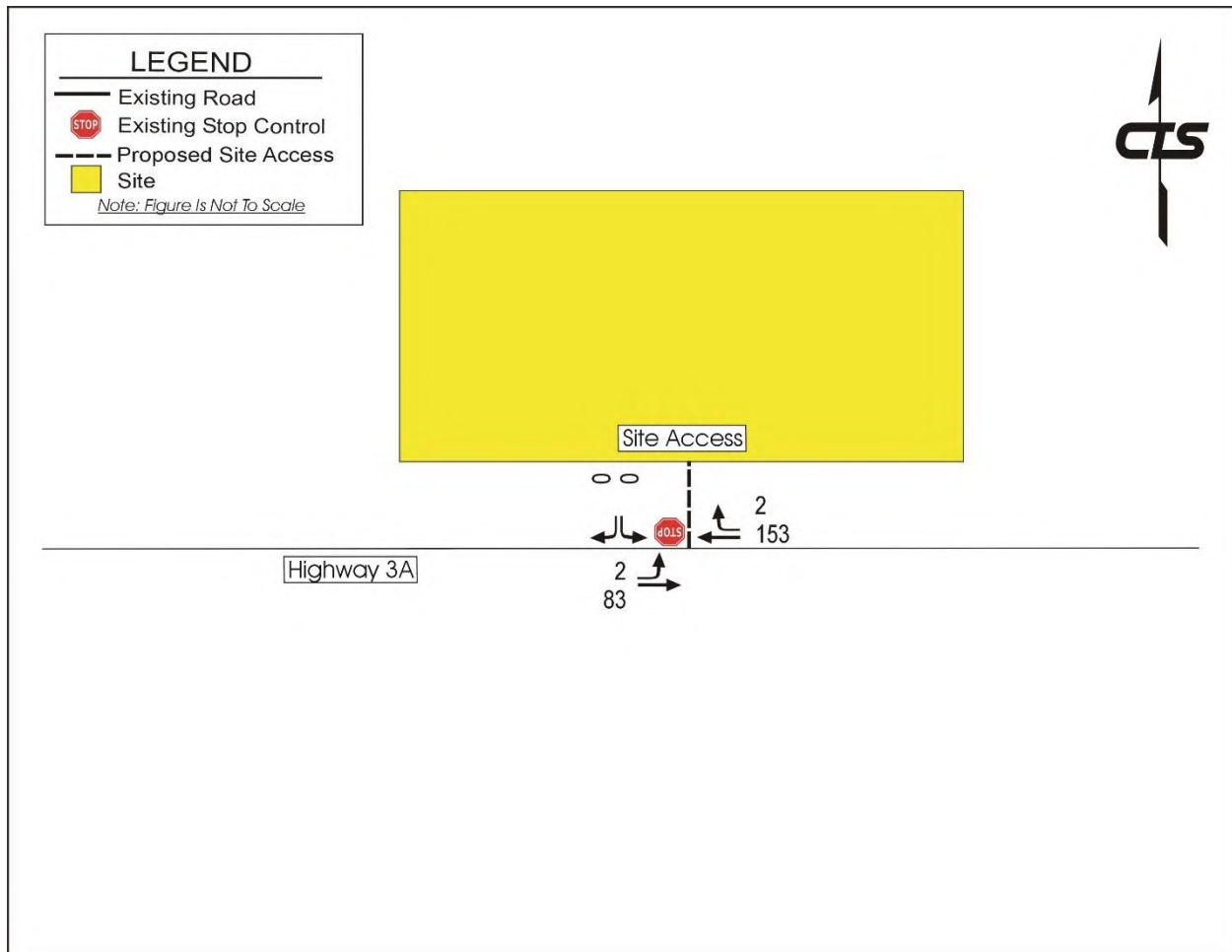
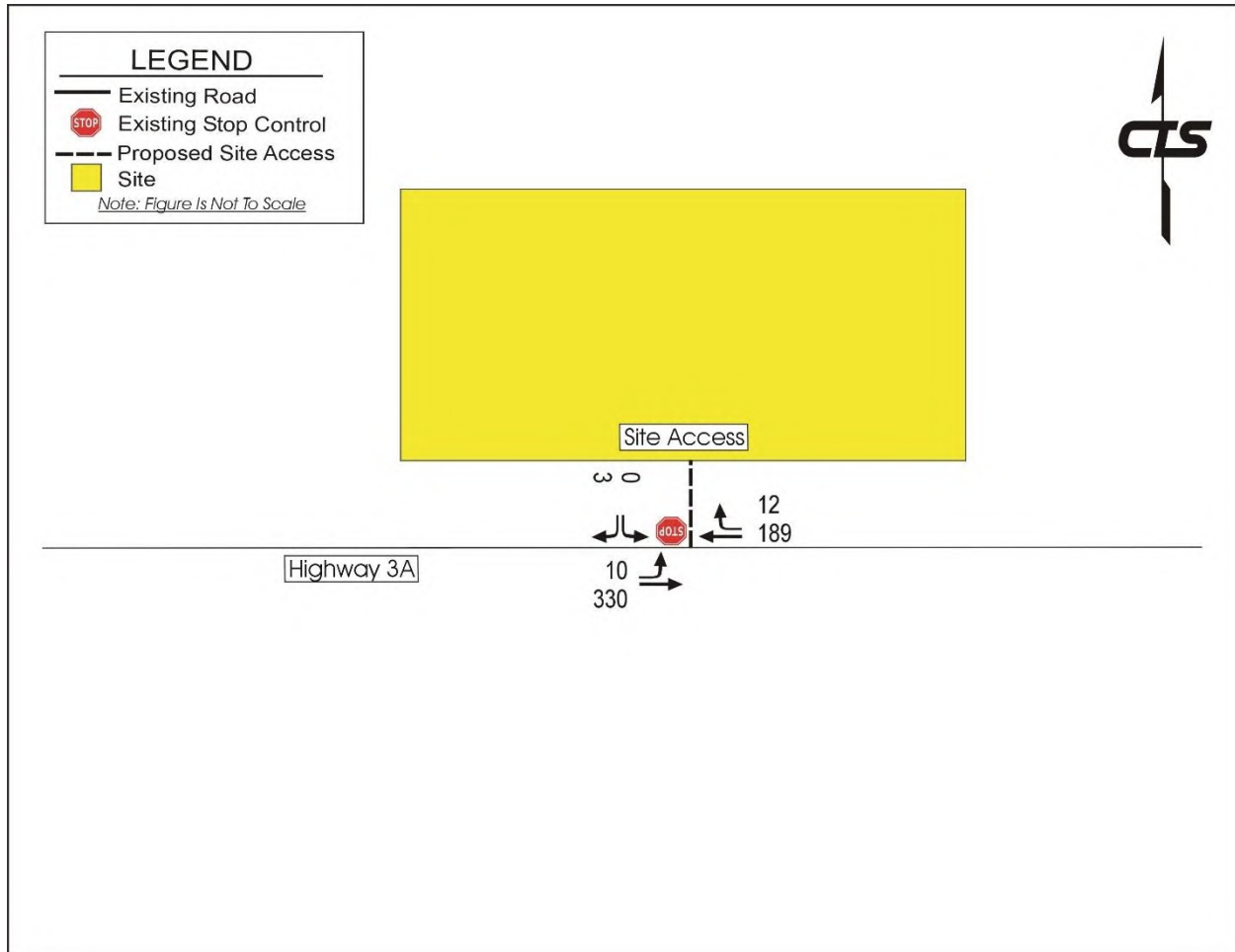


FIGURE 6
FACTORED 2024 WEEKDAY AFTERNOON PEAK HOUR BASE TRAFFIC VOLUMES



2.2 Future Traffic Volumes

2026 Future Base Traffic Volumes

2026 is anticipated to be the year of the buildout of the proposed development. The 2024 base traffic volumes were factored up by a traffic volume growth rate of 1.0% per annum (simple straight line) to represent base year 2026 volumes.

FIGURE 7 and **FIGURE 8** illustrate the weekday morning and weekday afternoon, respectively.

FIGURE 7
2026 WEEKDAY MORNING PEAK HOUR BASE TRAFFIC VOLUMES

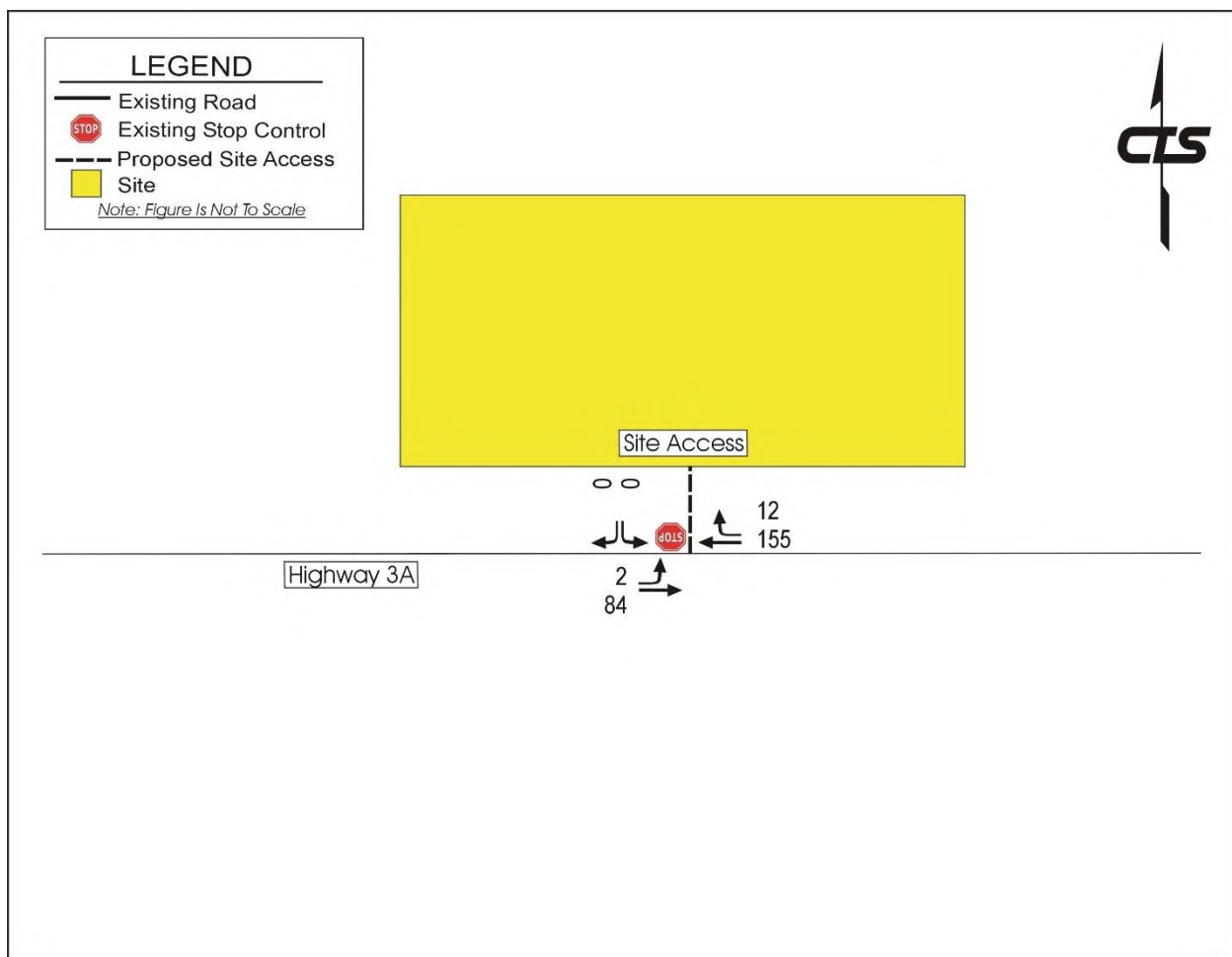
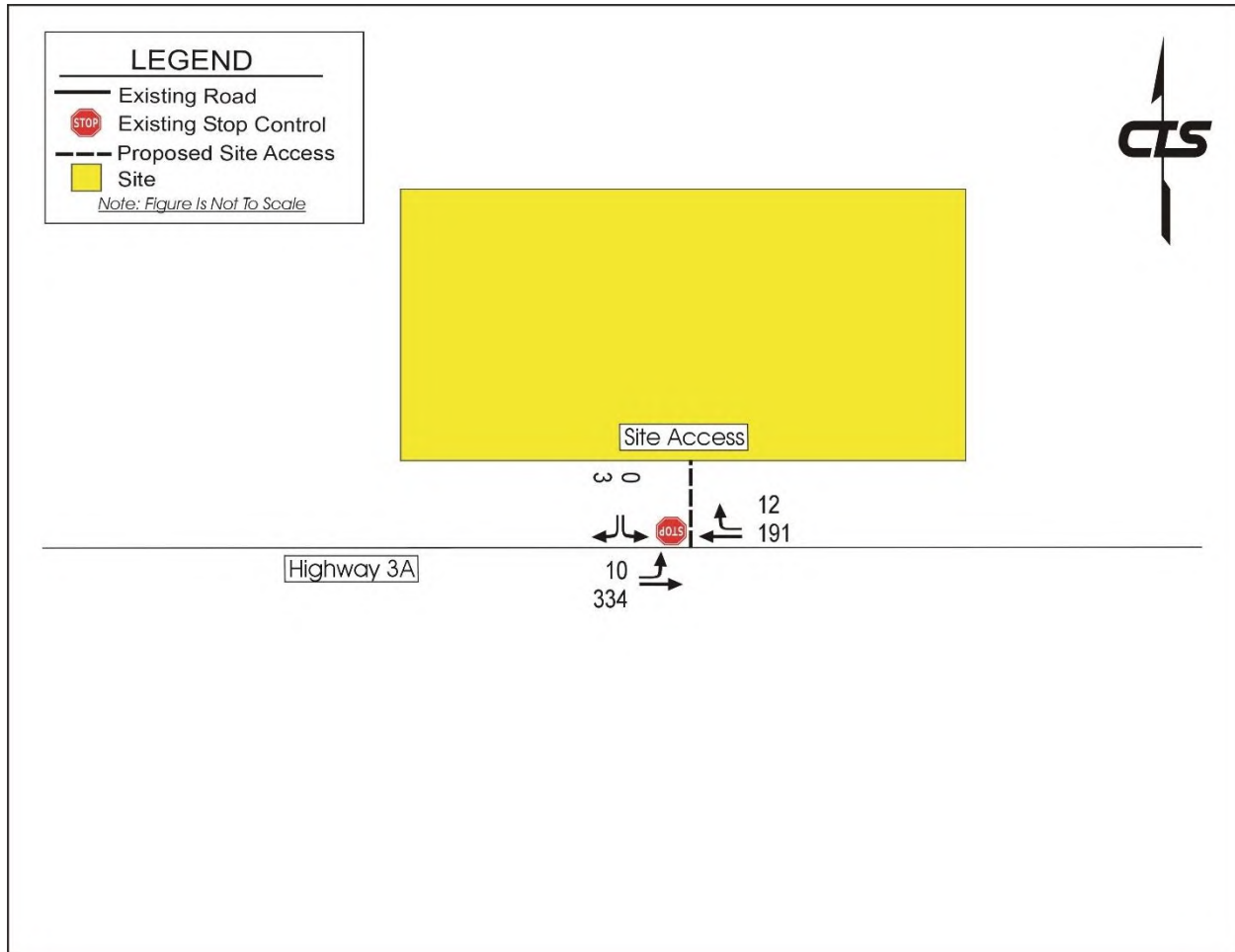


FIGURE 8
2026 WEEKDAY AFTERNOON PEAK HOUR BASE TRAFFIC VOLUMES



3.0 SITE TRAFFIC VOLUMES

3.1 Trip Generation

CTS utilized employee data and projections as provided by Spearhead for trip generation purposes. The truck and vehicle projections are included in **APPENDIX B** and summarized in **TABLE 2** below.

TABLE 2
SUMMARY OF SITE GENERATED TRAFFIC

Staff	Peak Hour	Peak Hour Volumes (vph)		
		in	out	total
Manufacturing, Office, and Day Care Employees	Weekday Morning	36	0	36
	Weekday Afternoon	0	36	36

From **TABLE 2**, the total current proposed site is forecasted to generate a total of 36 vehicle trips (36 inbound, and 0 outbound) during the weekday morning peak hour and 36 vehicle trips (0 inbound and 36 outbound) during the weekday afternoon peak hour.

3.2 Trip Distribution

As the vast majority of employees commuting to the site will be residing in and near the City of Nelson. Based on discussions with the client, CTS has assumed that 90% of vehicle trips will be to and from west of the site towards the City of Nelson, with the remaining 10% of vehicle trips to be assigned to east of the site.

3.3 Traffic Assignment

FIGURE 9 and **FIGURE 10** illustrate the site generated traffic volumes on the *existing* road network for the weekday morning and afternoon peak hours, respectively.

FIGURE 9
2026 SITE TRAFFIC VOLUMES FOR WEEKDAY MORNING PEAK HOUR

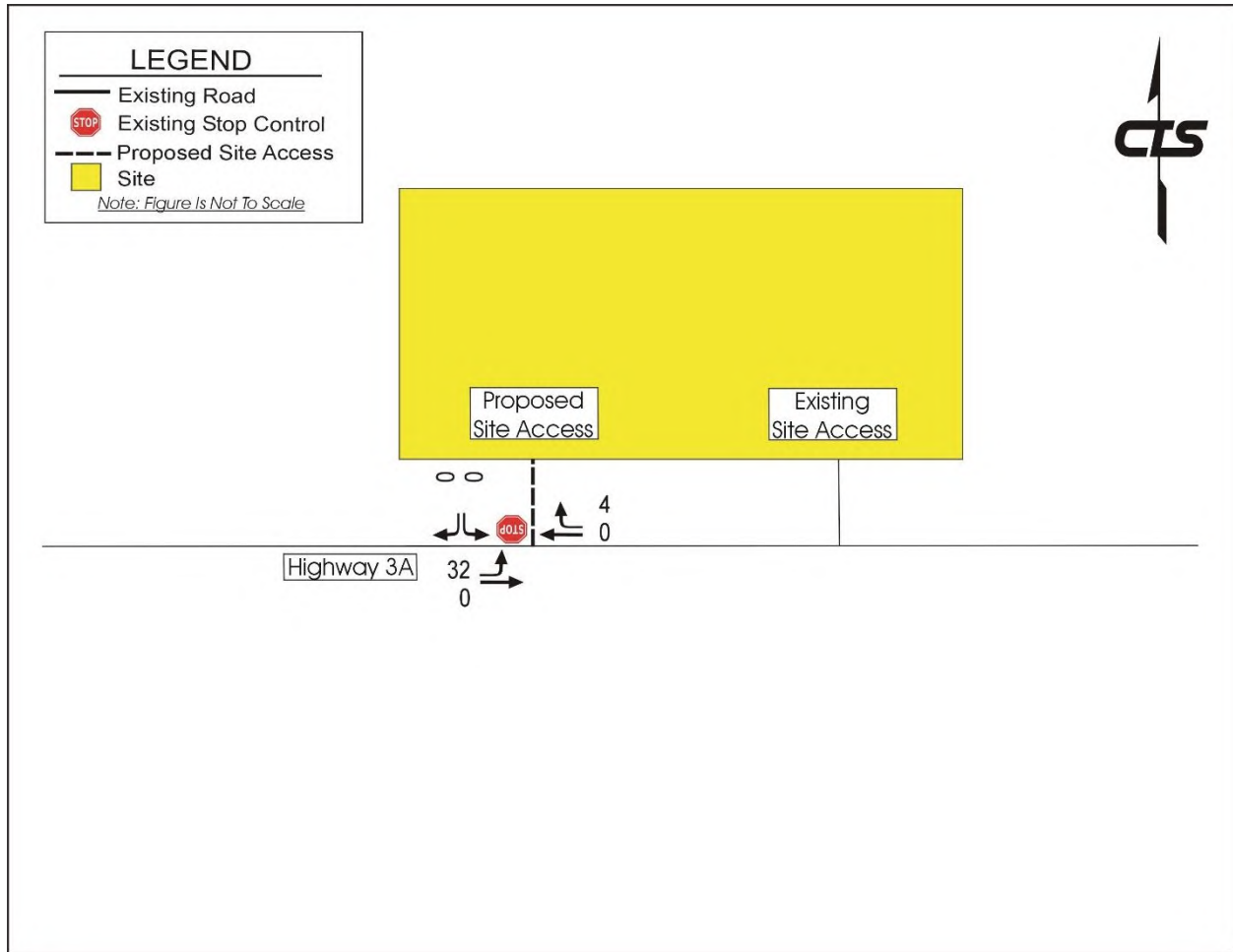
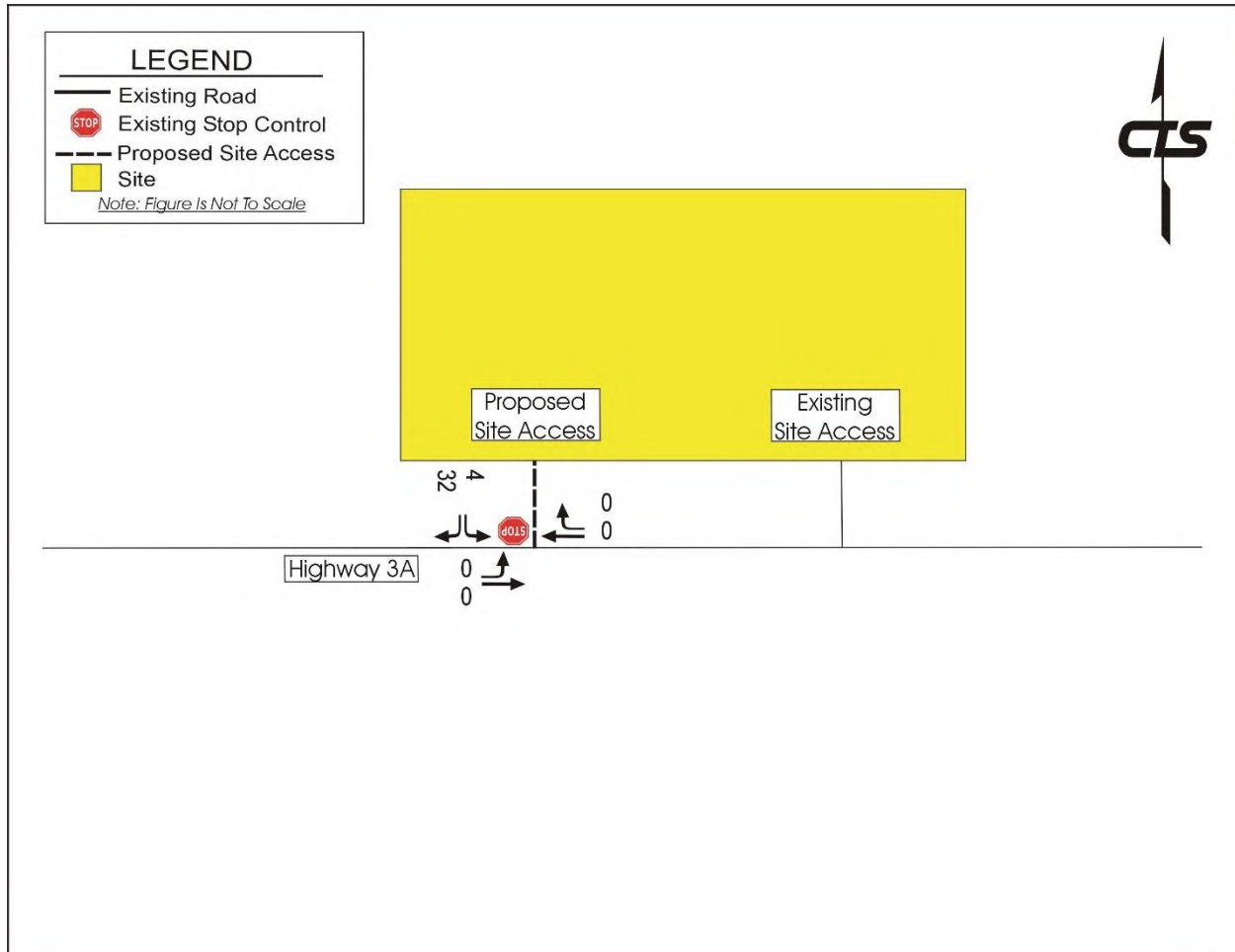


FIGURE 10
2026 SITE TRAFFIC VOLUMES FOR WEEKDAY AFTERNOON PEAK HOUR



4.0 BASE + SITE TRAFFIC VOLUMES

2026 Base + Site Volumes

FIGURE 11 illustrates the total projected traffic for the year 2026 weekday morning peak hour consisting of both base and site traffic resulting from the proposed development. It is the result of superimposing **FIGURE 9** onto **FIGURE 7**.

FIGURE 12 illustrates the total projected traffic for the year 2026 weekday afternoon peak hour consisting of both base and site traffic resulting from the proposed development. It is the result of superimposing **FIGURE 10** onto **FIGURE 8**.

FIGURE 11
2026 WEEKDAY MORNING PEAK HOUR BASE+SITE TRAFFIC VOLUMES

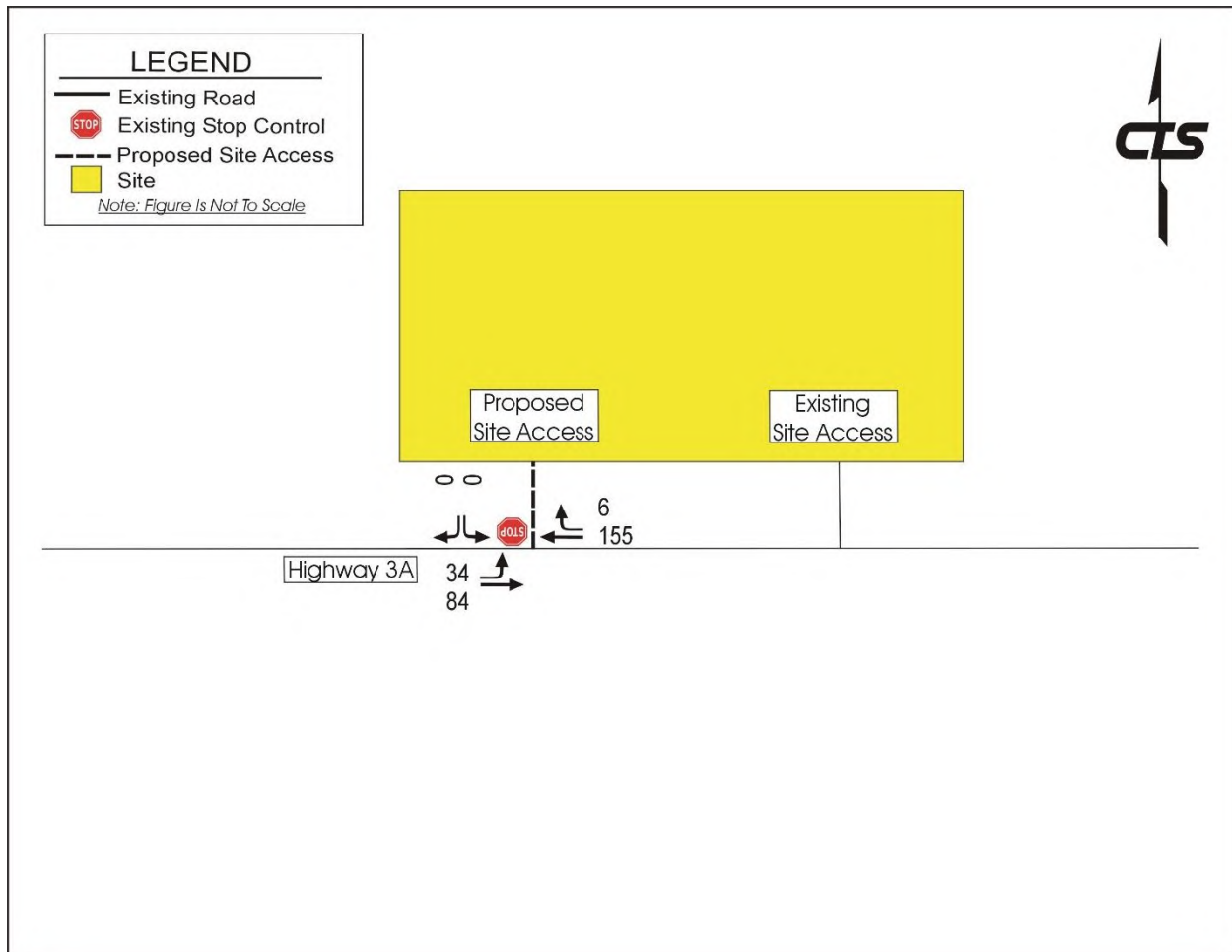
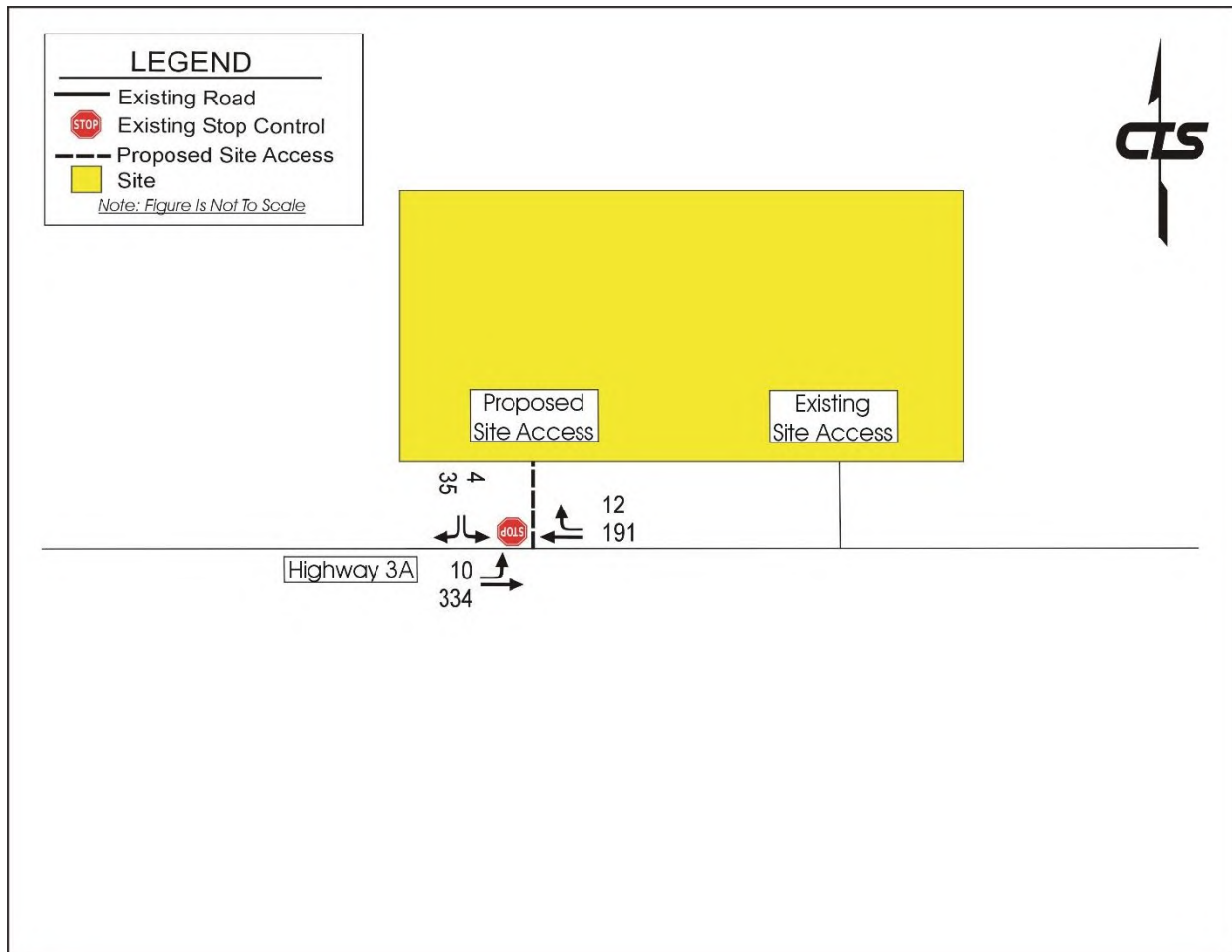


FIGURE 12
2026 WEEKDAY AFTERNOON PEAK HOUR BASE+SITE TRAFFIC VOLUMES



5.0 TRAFFIC ENGINEERING ANALYSIS

5.1 Capacity Analysis

Capacity analysis was performed at the location in order to determine the intersection levels of service (LOS) that is provided to motorists. The LOS for intersections and movements is defined in terms of delay (seconds per vehicle), which is a measure of driver discomfort and frustration, fuel consumption and lost travel time.

An intersection or movement LOS can range from "A" (Excellent) to "F" (Fail). See **Table 3**. A LOS of "F" (Fail) indicates that an intersection or movement is failing because the intersection or movement is over capacity and delays are considered excessive. A LOS of "D" during the critical peak hours is considered acceptable by many public agencies in large urban areas for overall intersection operation and a LOS of "E" or better is considered acceptable for left turn movements as it recognizes that the intersections normally perform much better the remaining 90% of the day.

**TABLE 3
LEVEL OF SERVICE DESCRIPTIONS**

Level of Service	Description
A	Excellent
B	Good
C	Fair
D	Poor
E	Very Poor
F	Fail

Highway Capacity Software (HCS 2024) was used for the analysis of the unsignalized intersections.

The analyses used the factored traffic volumes to yield the most conservative results.

The following assumptions were made with respect to the intersection capacity analysis:

- *Saturation flow rate* = 1,800 passenger cars/hour of green time/lane (pcphgpl)
- *Peak hour factor* (PHF) = 0.81 (weekday morning peak) and 0.76 (weekday afternoon peak) which is the factor observed from the surveyed intersections.
- Heavy vehicle percentage for roads = 3%

Saturation flow rate is the equivalent hourly rate at which previously queued vehicles can traverse an intersection approach under prevailing conditions, assuming that the green signal is available at all times and no lost times are experienced. It is a base rate to which adjustment factors are applied.

Peak Hour Factor is a measure of traffic demand fluctuation within the analysis hour. The closer the number is to 1.00, the less fluctuation during the hour.

5.2 Unsignalized Intersections

TABLE 4 summarizes and compares the main performance parameters of the intersection capacity analysis for unsignalized intersections.

For unsignalized intersections, the delay time in seconds for each lane group is summarized. Delay is additional travel time experienced by a driver, passenger, bicyclist, or pedestrian beyond that required to travel at the desired speed.

The capacity analysis worksheets with Levels of Service for each individual movement are included in **APPENDIX C**.

TABLE 4
CAPACITY ANALYSIS FOR SITE ACCESS AND HIGHWAY 3A

Intersection	Time of Day	Scenario	Performance Measure	Eastbound			Westbound			Northbound			Southbound			LOS	Notes
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right		
Site Access (N/S) & Hwy 3A (E/W)	Weekday Morning Peak Hour	2024 Base	Volumes	2	83			153	2				0		0	A	Okay.
			Delay	8	0			0							0.0		
			95% Queue (m)	0	0			0							0.0		
		2026 Base	Volumes	2	84			155	2				0		0	A	Okay.
			Delay	8	0			0							0.0		
			95% Queue (m)	0	0			0							0.0		
		2026 Base + Site	Volumes	34	84			155	6				0		0	A	Okay.
			Delay	8	0			0							0.0		
			95% Queue (m)	1	0			0							0.0		
	Weekday Evening Peak Hour	2024 Base	Volumes	10	330			189	12				0		3	A	Okay.
			Delay	8	0			0							9.6		
			95% Queue (m)	0	0			0							0.0		
		2026 Base	Volumes	10	334			191	12				0		3	A	Okay.
			Delay	8	0			0							9.7		
			95% Queue (m)	0	0			0							0.0		
		2026 Base + Site	Volumes	10	334			191	12				4		35	A	Okay.
			Delay	8	0			0							10.5		
			95% Queue (m)	0	0			0							1.4		

Delay = Average Delay (seconds/vehicle)

Intersection approaching capacity (LOS 'D' or 'E'); or medium approach delays (25sec to <50sec)

Intersection equals or exceeds capacity (LOS 'F'); or high approach delays (>= 50sec)

From **TABLE 4**, the following observations can be made:

Site Access and Highway 3A

- The intersection overall operates at LOS A (Excellent) for all analysis scenarios.
- By comparing the results of the capacity analysis between the Base and Base + Site scenarios for the horizon years analyzed in this study, it is found that the traffic added by the proposed development does not significantly impact the performance of this intersection.
- The addition of site traffic in 2026 represents a 15% (36 vehicles) increase in the weekday morning peak hour intersection volume, and a 7% (36 vehicles) increase in the weekday afternoon peak hour intersection volume.
- No operational and/or geometrical improvements are recommended for this location.

6.0 INTERSECTION WARRANTS ANALYSIS

6.1 Left-Turn Warrant Analysis

A left-turn warrant was conducted for the eastbound left-turn movement at the intersection of the Site Access & Highway 3A. Methodology and graphs from the Ontario Ministry of Transportation (MoT) were used for the analysis. The details of the left turn warrant analysis are included in **APPENDIX D. TABLE 5** below has a summary of the results of the warrant analysis. Both base and base + site conditions in 2024 and 2026 were considered.

**TABLE 5
LEFT-TURN WARRANT ANALYSIS RESULTS**

LTFE-TURN LANE WARRANT ANALYSIS - HIGHWAY 3B									
Location	Direction	Scenario	Peak Hour	Opposing Traffic Volume	Advancing Traffic Volume	Left Turn Traffic Volume	Percentage of Left-Turning Traffic	Left-Turn Lane Warrant	Left-Turn Storage Length
				V _O	V _A	V _L	%	(Yes/No)	S (m)
Highway 3A	EB	2024 Base	1 Thursday AM	155	85	2	2%	N	0
			2 Thursday PM	201	340	10	3%	N	0
		2026 Base + Site	3 Thursday AM	161	118	34	29%	N	0
			4 Thursday PM	203	344	10	3%	N	0

The analysis shows that for all of the design conditions a left-turn lane is not warranted.

7.0 SITE AND ACCESS REVIEW

7.1 Swept Path Analysis

Swept path drawing analysis was conducted to ensure the manoeuvrability WB-20 trucks in and out of the site without impacting traffic operations on Highway 3A. Areas analysed were determined from expected ingress and egress manoeuvres that could potentially be difficult for users or results in conflicts. All movements have been analysed with a 0.5 metre buffer area around all sides of the vehicle. All swept path drawings can be found in **APPENDIX E**.

WB-20 tractor-trailers are able to enter and exit all areas with no conflicts.

All swept path analysis has been conducted with the site plan provided to CTS on December 09, 2024.

7.1 Sight Line Analysis

Sight line analysis was conducted during a site visit with a posted speed limit of 80 km/h. Using methodology from the *TAC Geometric Design Guide for Canadian Roads "Chapter 2 – Design Controls, Classification and Consistency"*, the sight line looking west of the proposed driveway access was measured to be 148 metres, and the sight line looking east was measured to be 224 metres. These exceed the design stopping sight distance of 130 metres for the design speed of 80 km/h as listing in Table 2.5.2 of the *TAC Geometric Design Guide for Canadian Roads "Chapter 2 – Design Controls, Classification and Consistency"*.

Additionally, intersection sight triangle analysis was conducted with a posted speed limit of 80 km/h. Using methodology from the *TAC Geometric Design Guide for Canadian Roads "Chapter 9 – Intersections"*, the intersection sight distance turning right westbound of the proposed driveway access was calculated to be 145 metres as listed in Table 9.9.6, and the intersection sight distance turning left eastbound was calculated to be 170 metres. The sightlines as measured in the field were found to be 148 metres for the right-turn westbound and 224 metres for the left-turn east-bound, both of which exceed the calculated intersection sight distances.

Field notes with measurements for the sightlines can be found in **APPENDIX F**.

8.0 CONCLUSIONS & RECOMMENDATIONS

8.1 Conclusions

- 1) Spearhead is proposing an expansion to their site, including additional manufacturing and office space, as well as a day care centre for use by employees.
- 2) The proposed development is connected to alternative modes of travel. The closest bus stop is within 400 metres walking distance from the access to the development. There is no dedicated cycling or pedestrian infrastructure, however there are shoulders alongside both sides of Highway 3A.
- 3) CTS conducted turning movement counts on Thursday, November 21, 2024 from 06:00 to 09:00 and 15:00 to 18:00 to document the typical weekday morning and afternoon peak hour traffic volumes for the following study intersections:
 - Site Access & Highway 3A
- 4) The following peak hours were selected, based on the peak hours observed by the study intersections:
 - Weekday Morning Peak Hour – 07:45 – 08:45
 - Weekday Afternoon Peak Hour – 16:15 – 17:15
- 5) The proposed development at full build-out, is forecasted to generate a total of 36 vehicle trips (36 inbound, and 0 outbound) during the weekday morning peak hour and 36 vehicle trips (0 inbound and 36 outbound) during the weekday afternoon peak hour.
- 6) A capacity analysis was conducted at the study intersection with the following results:
 - Site Access & Highway 3A: LOS A (Excellent) during all analysis periods.
- 7) A left-turn warrant analysis was conducted for the eastbound left-turn movement at the intersection of the Site Access & Highway 3A.
 - A left-turn lane was determined to **not be warranted** in all analysis scenarios.
- 8) Swept path analysis using the design vehicle WB-20 was conducted and no conflicts were found with a 0.5 metre buffer.
- 9) Sight line analysis was conducted using an 80 km/h design speed for stopping sight distance. The measured sight lines exceeded the design SSD.

8.2 Recommendations

- 1) CTS recommends that no further changes to the proposed layout and design of the site expansion are needed.
- 2) CTS recommends that the applicant work with the RDCK to have a streetlight installed on an existing pole in the immediate vicinity of the proposed new access.

We would like to take this opportunity to thank you for this unique project and we look forward to working with you again in the future. Please call the undersigned should you have any questions or comments.

Yours truly,

CREATIVE TRANSPORTATION SOLUTIONS LTD.

CTS Permit to Practice: 1000697

Reviewed by:

Prepared by:

Gary Vlieg, M.Sc., P.Eng. FEC
Vice President

Maciej Wysocki, EIT
Junior Traffic Engineer

Attachment

Appendix A

Turning Movement Counts



Site Access & Hwy 3A

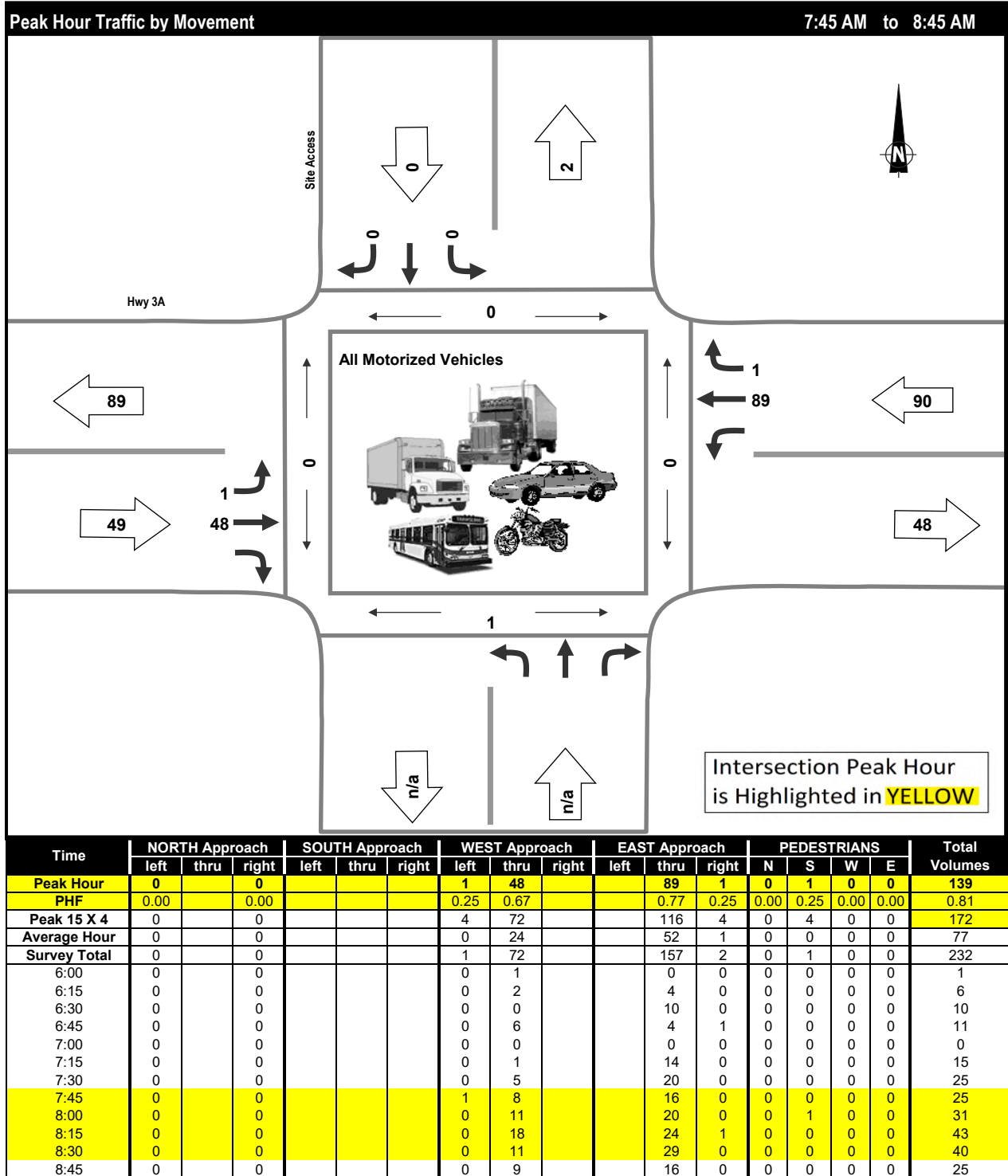
Thursday, November 21, 2024

Vehicle Classification Summary

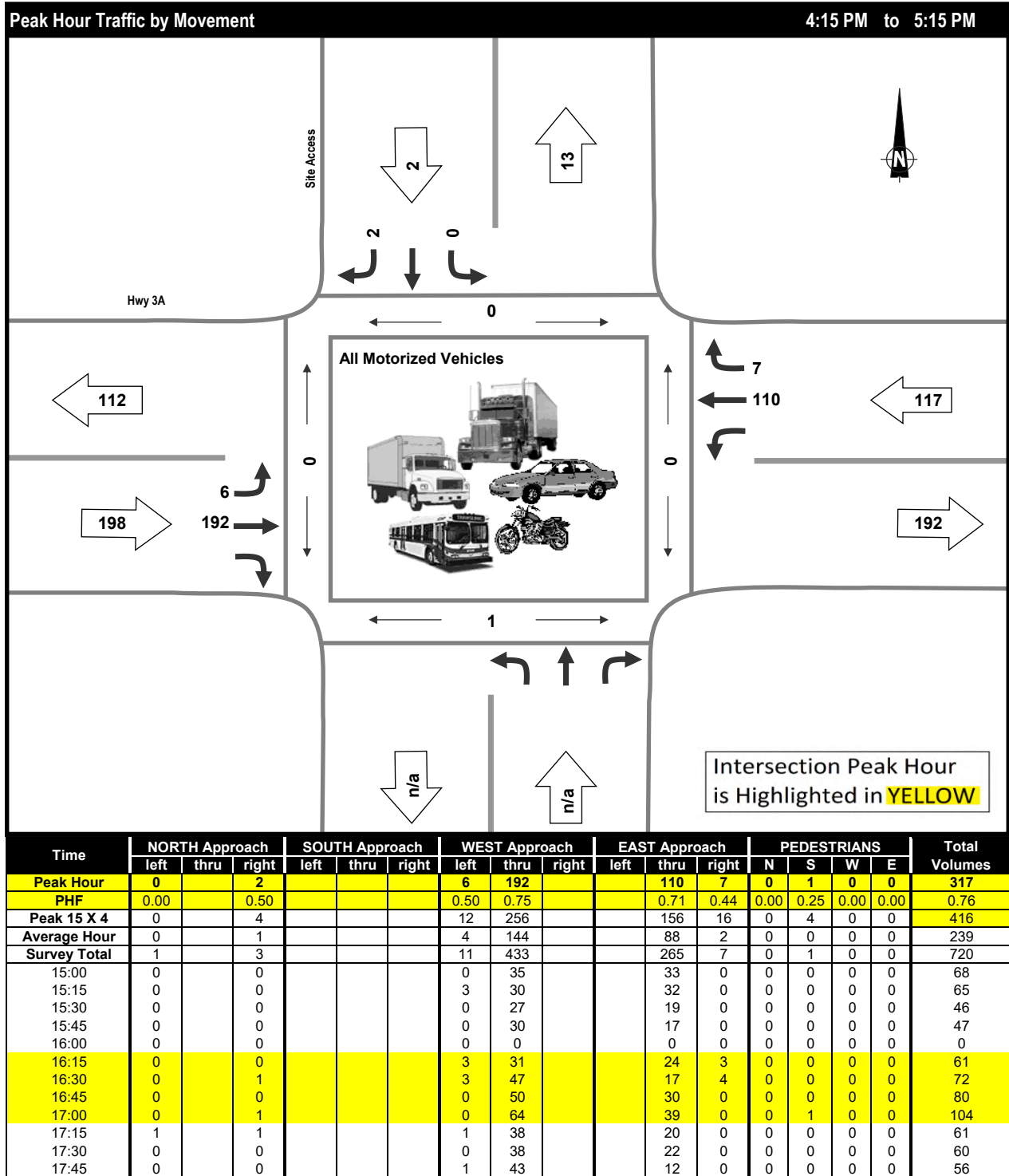
Project: #9393: Nelson Industrial Rezoning Access Study
Municipality: City of Nelson
Weather: Clear

Time Period	Entering Intersection	Vehicle Classification					Total
		Passenger Cars	Heavy Vehicles (3 or more axles)				
Morning (06:00 - 09:00)	Volume	220	12				232
	%	94.8%	5.2%				100.0%
	Volume						
	%						
Afternoon (15:00 - 18:00)	Volume	706	14				720
	%	98.1%	1.9%				100.0%
Total (6 Hours)	Volume	926	26				952
	%	97.3%	2.7%				100.0%

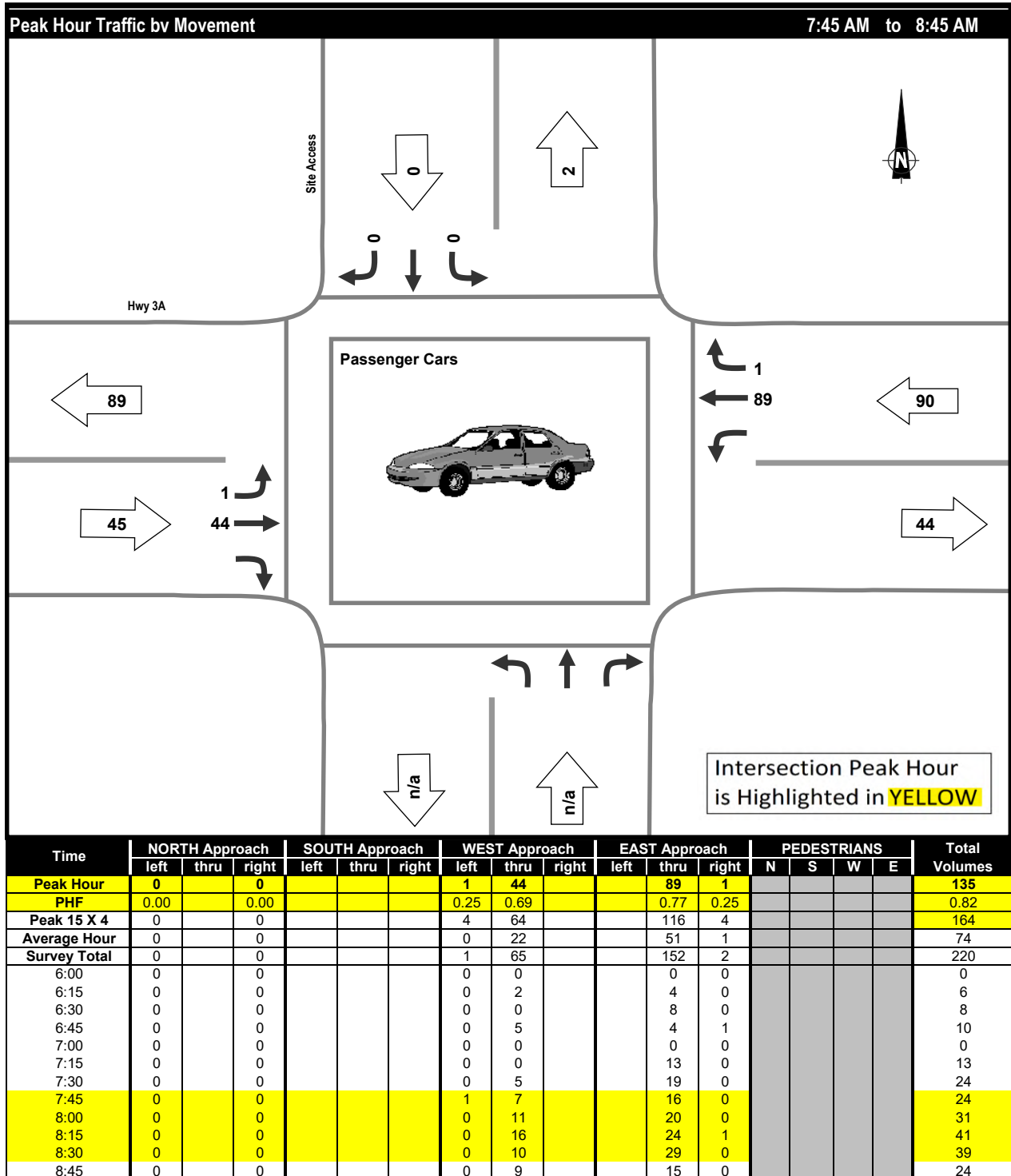
Project: #9393: Nelson Industrial Rezoning Access Study
Municipality: City of Nelson
Weather: Clear
Vehicle Class: All Motorized Vehicles

Morning Peak Period


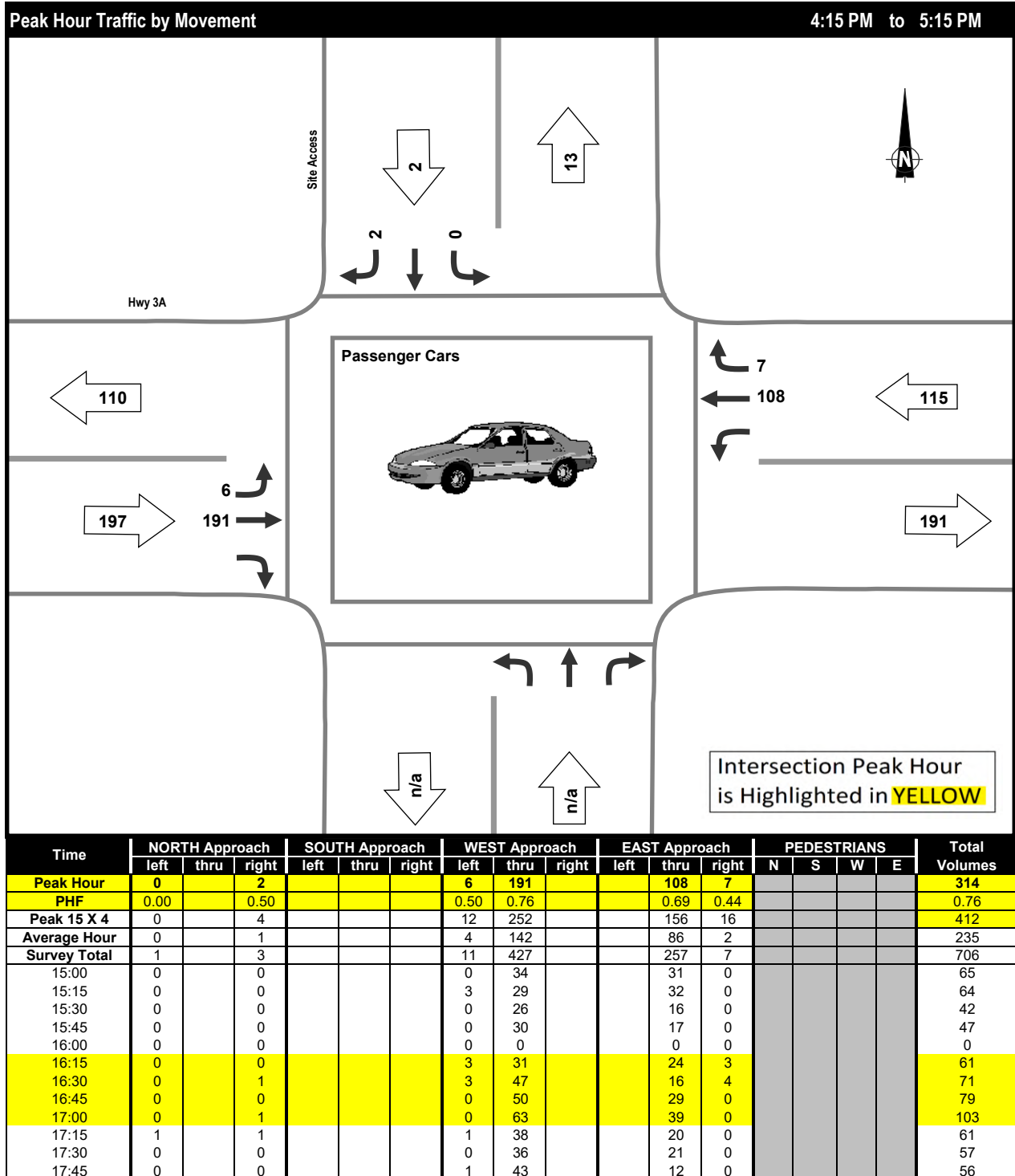
Project: #9393: Nelson Industrial Rezoning Access Study
Municipality: City of Nelson
Weather: Clear
Vehicle Class: All Motorized Vehicles

Afternoon Peak Period


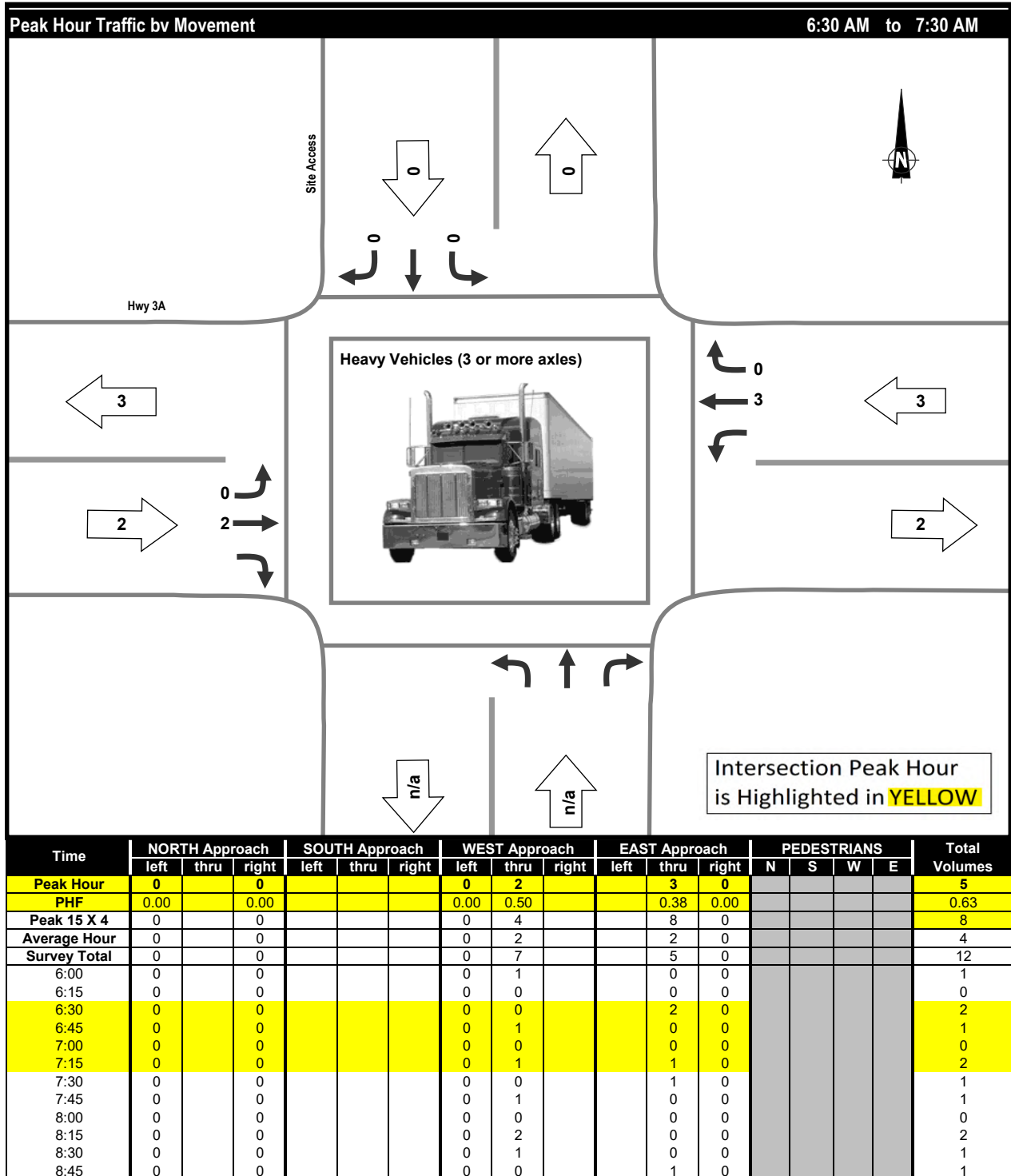
Project: #9393: Nelson Industrial Rezoning Access Study
Municipality: City of Nelson
Weather: Clear
Vehicle Class: Passenger Cars

Morning Peak Period


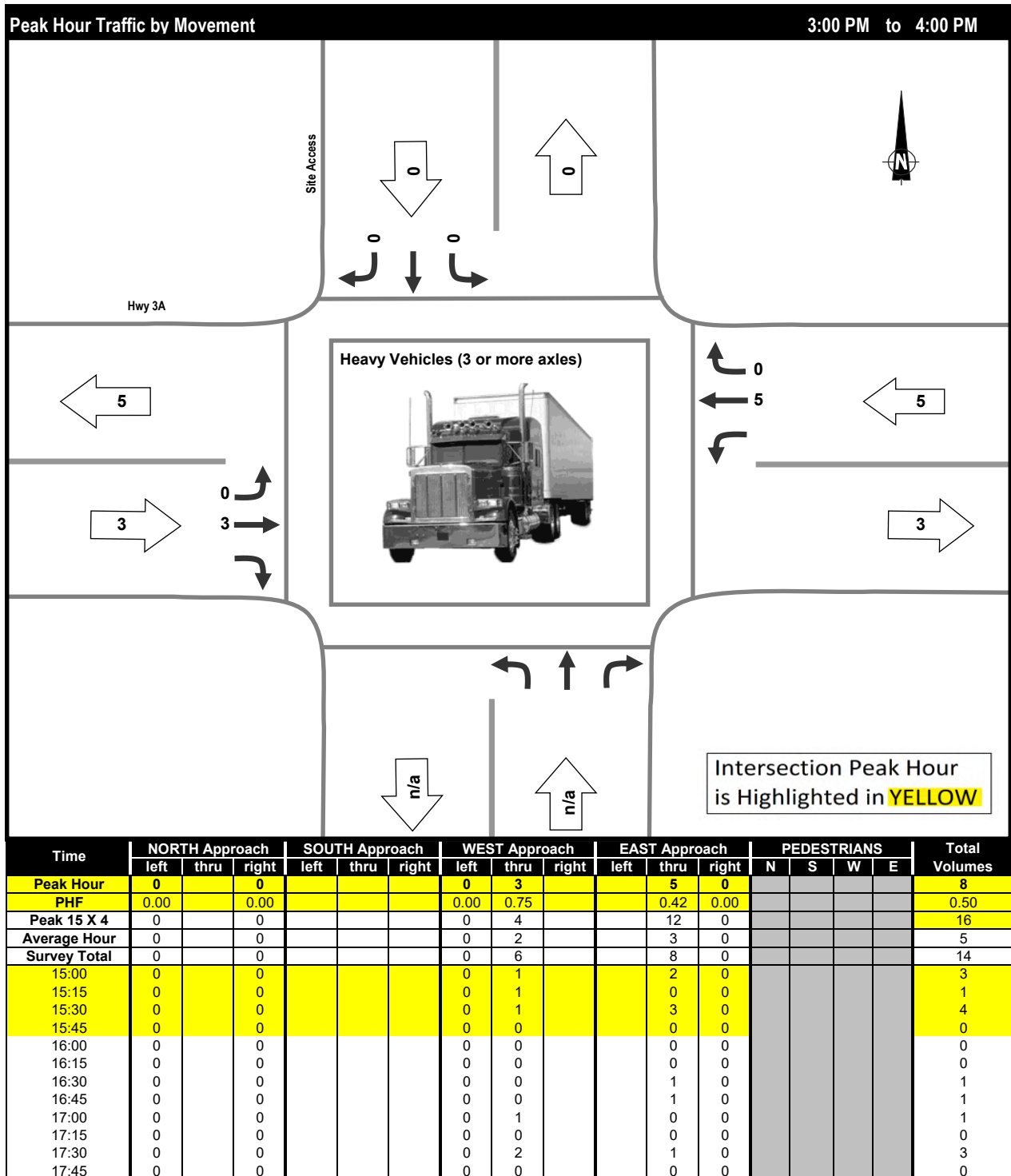
Project: #9393: Nelson Industrial Rezoning Access Study
Municipality: City of Nelson
Weather: Clear
Vehicle Class: Passenger Cars

Afternoon Peak Period


Project: #9393: Nelson Industrial Rezoning Access Study
Municipality: City of Nelson
Weather: Clear
Vehicle Class: Heavy Vehicles (3 or more axes)

Morning Peak Period


Project: #9393: Nelson Industrial Rezoning Access Study
Municipality: City of Nelson
Weather: Clear
Vehicle Class: Heavy Vehicles (3 or more axles)

Afternoon Peak Period


Appendix B

Spearhead Employee and Trip Projections

NEW DEVELOPMENT	YEAR	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
	TRANSPORT TRUCKS										
	M ³ INPUT LAMELLA BY SPECIES	2624	4665	5423	5423	5423	5423	5423	5423	5423	5423
	TOTAL INBOUND TRUCKS PER YEAR	58	104	121	121	121	121	121	121	121	121
	TOTAL INBOUND TRUCKS PER WEEK	1.12	1.99	2.32	2.32	2.32	2.32	2.32	2.32	2.32	2.32
	M ³ FINISHED PRODUCT SHIPPED	2303	4095	4760	4760	4760	4760	4760	4760	4760	4760
	TOTAL OUTBOUND TRUCKS PER YEAR	66	117	136	136	136	136	136	136	136	136
	TOTAL OUTBOUND TRUCKS PER WEEK	1.27	2.25	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62
		1.27	2.25	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62
EXISTING	SPEARHED 2024 TRUCK PER WEEK AVERAGE	2	2	2	2	2	2	2	2	2	2
COMBINED	TOTAL AVERAGE TRUCKS PER WEEK	3.36	4.42	4.82	4.82	4.82	4.82	4.82	4.82	4.82	4.82

How many m3 delivered per truck avg?

45 m3 / truck

How many m3 shipping out per truck avg?

35 m3 / truck

Max Per Week

Average Per Week

How many trucks are being shared in/out?

75% Efficiency rate

NEW DEVELOPMENT	YEAR	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
	Vehicle Trips										
	PRODUCTION STAFF: 6:30AM-4:00PM	6	8	9	9	9	9	9	9	9	9
	PRODUCTION STAFF: 7:30AM-5:15PM	10	13	14	14	14	14	14	14	14	14
	OVERHEAD STAFF: 8:30AM-5:00PM	9	13	14	14	15	15	15	16	16	16
	OVERHEAD STAFF: 9:30AM-6:00PM	13	19	22	22	22	22	23	24	24	25
	Daycare Staff: 8:30AM-5:30PM	0	0	0	0	2	2	2	2	2	2
	TOTAL OVERHEAD STAFF WORKING AT HQ	0	0	0	0	26	26	27	28	28	29
	TOTAL STAFF WORKING AT HQ	10	13	14	14	40	40	41	42	42	42
EXISTING	PRODUCTION STAFF: 6:30AM-4:00PM	11	11	11	11	11	11	11	11	11	11
	PRODUCTION STAFF: 7:30AM-5:15PM	16	16	16	16	16	16	16	16	16	16
	OVERHEAD STAFF: 8:30AM-5:00PM	15	15	15	15	15	15	15	15	15	15
	OVERHEAD STAFF: 9:30AM-6:00PM	23	23	23	23	23	23	23	23	23	23
	TOTAL OVERHEAD STAFF WORKING AT HQ	10	10	10	10	10	10	10	10	10	10
	TOTAL STAFF WORKING AT HQ	37	37	37	37	37	37	37	37	37	37
COMBINED	TOTAL STAFF WORKING AT HQ	46	49	51	51	77	77	77	79	79	79
COMBINED	ARRIVALS BY TIME	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
	6:30am	17	19	20	20	20	20	20	20	20	20
	7:30am	26	29	30	30	32	32	32	32	32	32
	8:30am	10	10	10	10	20	20	20	20	20	21
	9:30am	15	15	15	15	29	29	30	30	30	31
	DEPARTURES BY TIME	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
	4:00pm	17	19	20	20	20	20	20	20	20	20
	5:00pm	10	10	10	10	20	20	20	20	20	21
	5:15pm	26	29	30	30	30	30	30	30	30	30
	5:30pm	0	0	0	0	2	2	2	2	2	2
	6:00pm	15	15	15	15	29	29	30	30	30	31

How many overhead (office) staff are working at HQ?

65% OH Staff working from HQ

Rest of staff work from Nelson office, remote, etc.

How many production staff are on the early start schedule?

40% Production staff start early

How many overhead staff are on the early start schedule?

40% Production staff start early

Total Current Production Staff

27 Staff

Total Current Overhead Staff

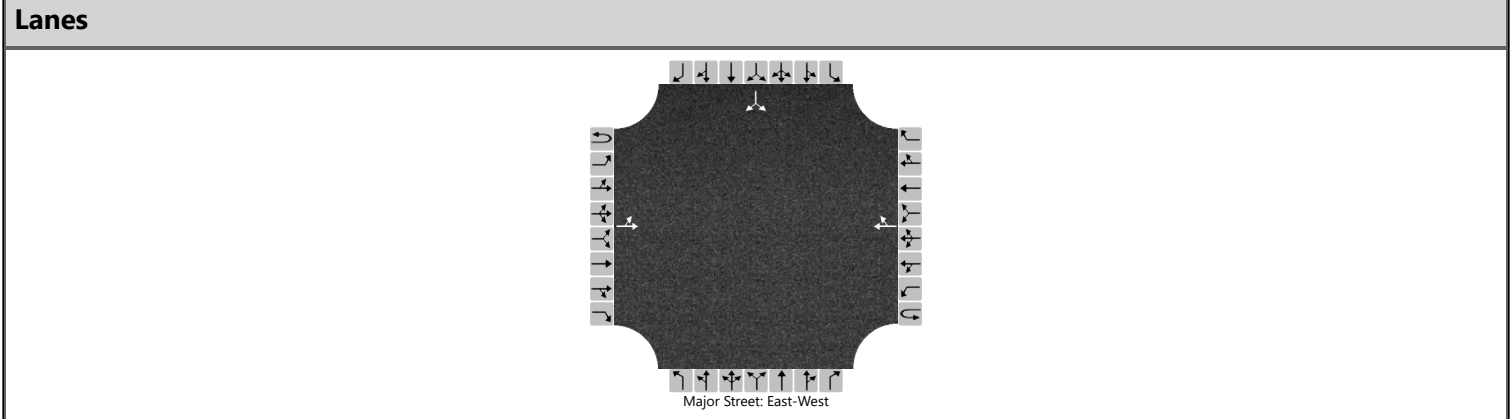
38 Staff

Appendix C

Capacity Analysis

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MW	Intersection	Site Access & Highway 3A
Agency/Co.	CTS	Jurisdiction	RDCK
Date Performed	12/6/2024	East/West Street	Highway 3A
Analysis Year	2024	North/South Street	Site Access
Time Analyzed	AM 2024 Base	Peak Hour Factor	0.81
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	9393		



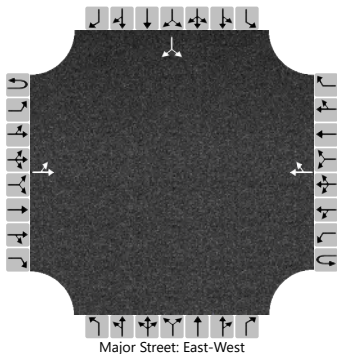
Vehicle Volumes and Adjustments																
Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		2	83				153	2						0		0
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)		4.1												7.1		6.2
Critical Headway (sec)		4.13												6.43		6.23
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.23												3.53		3.33

Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		2													0	
Capacity, c (veh/h)		1376													0	
v/c Ratio		0.00														
95% Queue Length, Q ₉₅ (veh)		0.0														
95% Queue Length, Q ₉₅ (ft)		0.0														
Control Delay (s/veh)		7.6	0.0													
Level of Service (LOS)		A	A													
Approach Delay (s/veh)	0.2															
Approach LOS	A															

General Information		Site Information	
Analyst	MW	Intersection	Site Access & Highway 3A
Agency/Co.	CTS	Jurisdiction	RDCK
Date Performed	12/6/2024	East/West Street	Highway 3A
Analysis Year	2026	North/South Street	Site Access
Time Analyzed	AM 2026 Base + Site	Peak Hour Factor	0.81
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	9393		

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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		34	84				155	6						0		0
Percent Heavy Vehicles (%)		3												3		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

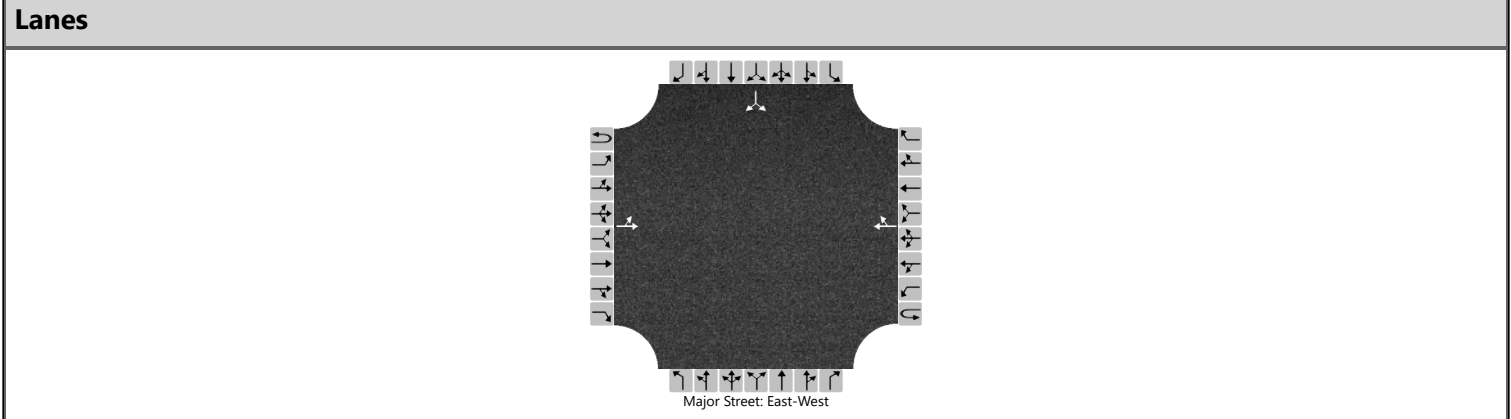
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Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		42												0	
Capacity, c (veh/h)		1368												0	
v/c Ratio		0.03													
95% Queue Length, Q_{95} (veh)		0.1													
95% Queue Length, Q_{95} (ft)		2.6													
Control Delay (s/veh)		7.7	0.3												
Level of Service (LOS)		A	A												
Approach Delay (s/veh)	2.4														
Approach LOS	A														

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MW	Intersection	Site Access & Highway 3A
Agency/Co.	CTS	Jurisdiction	RDCK
Date Performed	12/6/2024	East/West Street	Highway 3A
Analysis Year	2026	North/South Street	Site Access
Time Analyzed	AM 2026 Base	Peak Hour Factor	0.81
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	9393		



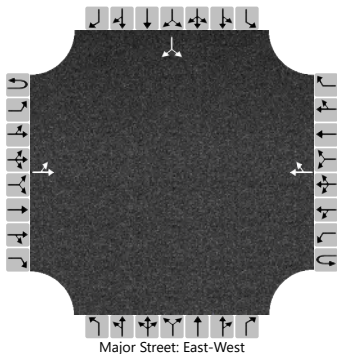
Vehicle Volumes and Adjustments																
Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		2	84				155	2						0		0
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)		4.1												7.1		6.2
Critical Headway (sec)		4.13												6.43		6.23
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.23												3.53		3.33

Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		2													0	
Capacity, c (veh/h)		1373													0	
v/c Ratio		0.00														
95% Queue Length, Q ₉₅ (veh)		0.0														
95% Queue Length, Q ₉₅ (ft)		0.0														
Control Delay (s/veh)		7.6	0.0													
Level of Service (LOS)		A	A													
Approach Delay (s/veh)	0.2															
Approach LOS	A															

General Information		Site Information	
Analyst	MW	Intersection	Site Access & Highway 3A
Agency/Co.	CTS	Jurisdiction	RDCK
Date Performed	12/6/2024	East/West Street	Highway 3A
Analysis Year	2024	North/South Street	Site Access
Time Analyzed	PM 2024 Base	Peak Hour Factor	0.76
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	9393		

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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		10	330				189	12						0		3
Percent Heavy Vehicles (%)		3												3		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

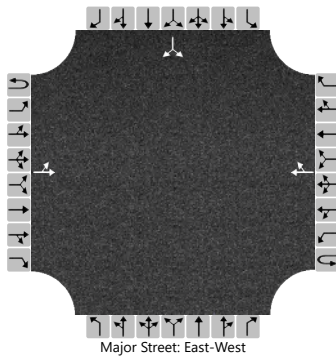
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Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		13												4	
Capacity, c (veh/h)		1294												780	
v/c Ratio		0.01												0.01	
95% Queue Length, Q_{95} (veh)		0.0												0.0	
95% Queue Length, Q_{95} (ft)		0.0												0.0	
Control Delay (s/veh)		7.8	0.1											9.6	
Level of Service (LOS)		A	A											A	
Approach Delay (s/veh)	0.3													9.6	
Approach LOS	A													A	

General Information		Site Information	
Analyst	MW	Intersection	Site Access & Highway 3A
Agency/Co.	CTS	Jurisdiction	RDCK
Date Performed	12/6/2024	East/West Street	Highway 3A
Analysis Year	2026	North/South Street	Site Access
Time Analyzed	PM 2026 Base + Site	Peak Hour Factor	0.76
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	9393		

Lanes	
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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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		10	334				191	12						4		35
Percent Heavy Vehicles (%)		3												3		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

[illegible]

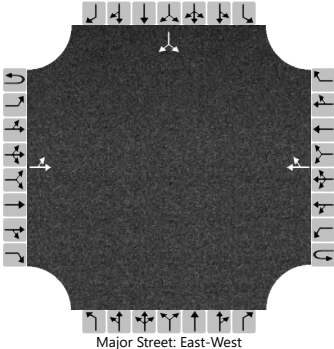
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		13													51	
Capacity, c (veh/h)		1291													704	
v/c Ratio		0.01													0.07	
95% Queue Length, Q_{95} (veh)		0.0													0.2	
95% Queue Length, Q_{95} (ft)		0.0													5.1	
Control Delay (s/veh)		7.8	0.1												10.5	
Level of Service (LOS)		A	A												B	
Approach Delay (s/veh)	0.3											10.5				
Approach LOS	A											B				

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	MW	Intersection	Site Access & Highway 3A
Agency/Co.	CTS	Jurisdiction	RDCK
Date Performed	12/6/2024	East/West Street	Highway 3A
Analysis Year	2026	North/South Street	Site Access
Time Analyzed	PM 2026 Base	Peak Hour Factor	0.76
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	9393		

Lanes



Major Street: East-West

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	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		10	334				191	12						0		3
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)		4.1												7.1		6.2
Critical Headway (sec)		4.13												6.43		6.23
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.23												3.53		3.33

Delay, Queue Length, and Level of Service																
Flow Rate, v (veh/h)		13													4	
Capacity, c (veh/h)		1291													777	
v/c Ratio		0.01													0.01	
95% Queue Length, Q ₉₅ (veh)		0.0													0.0	
95% Queue Length, Q ₉₅ (ft)		0.0													0.0	
Control Delay (s/veh)		7.8	0.1												9.7	
Level of Service (LOS)		A	A												A	
Approach Delay (s/veh)	0.3												9.7			
Approach LOS	A												A			

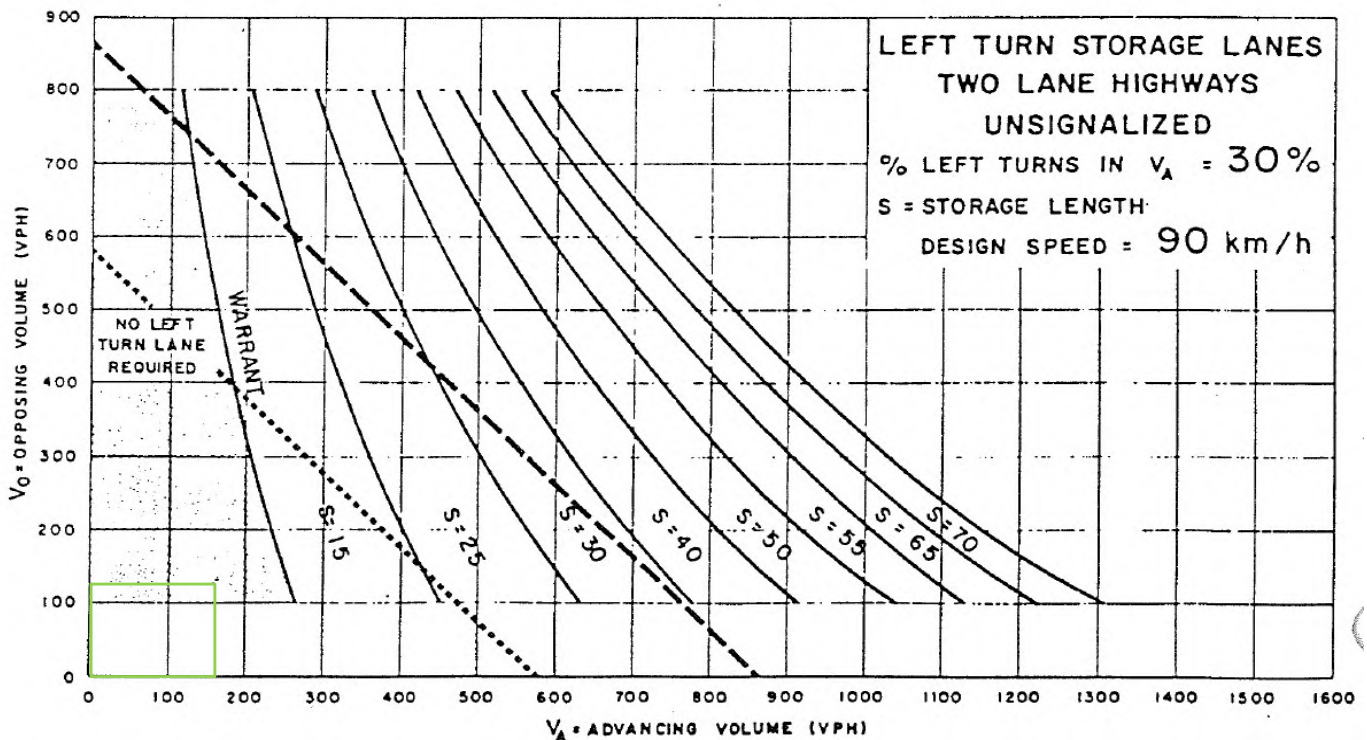
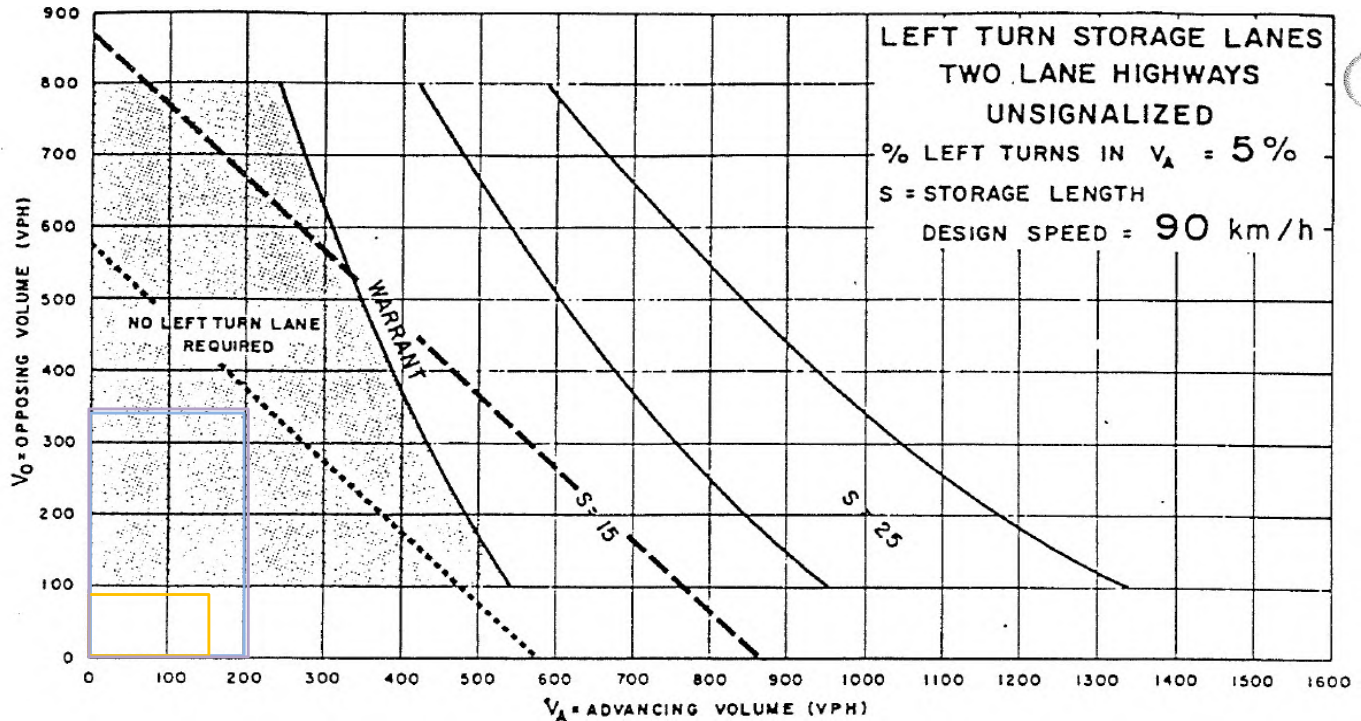
Appendix D

Left-Turn Warrant Analysis

Project: 9393 - Nelson Industrial Rezoning Access Study
Design Speed: 90 km/h

LTEF-TURN LANE WARRANT ANALYSIS - HIGHWAY 3B

Location	Direction	Scenario	Peak Hour	Opposing Traffic Volume V_O	Advancing Traffic Volume V_A	Left Turn Traffic Volume V_L	Percentage of Left-Turning Traffic %	Left-Turn Lane Warrant (Yes/No)	Left-Turn Storage Length S (m)
Highway 3A	EB	2024 Base	1 Thursday AM	155	85	2	2%	N	0
			2 Thursday PM	201	340	10	3%	N	0
		2026 Base + Site	3 Thursday AM	161	118	34	29%	N	0
			4 Thursday PM	203	344	10	3%	N	0



Appendix E

Swept Path Analysis

Appendix F

Field Notes

