



Real People. Real Solutions.

10400 Viking Drive
Suite 100
Eden Prairie, MN 55344
Phone: (612) 358-2637
Bolton-Menk.com

MEMORANDUM

Date: February 23, 2026

To: Tyler Krage, P.E., PTOE, Dakota County
Pranav Sharma, P. Eng., Dakota County

From: Mike Larson, P.E., PTOE, RSP1

Subject: CSAH 73 School Zone Speed Limit Study
Rosemount, Dakota County, MN
2025 and 2026 Traffic Engineering and Consulting Services

Introduction

Dakota County requested Bolton & Menk's services in completing a school zone speed limit study of CSAH 73 south of Bonaire Path, near the Emerald Trail Elementary School in the city of Rosemount, Minnesota. A review of vehicle speed data, traffic patterns, roadway geometry and sightlines, crash history, etc. were performed to arrive at a recommended school zone speed limit based on MnDOT guidance. This memorandum serves as a summary of the study methodology and to document the findings.

School Route Plan Evaluation

To identify and recommend appropriate design parameters of a school zone speed limit (SZSL) at the study location, a step-by-step process was followed. The process uses guidance provided in MnDOT's *A Guide to Establishing Speed Limits in School Zones (2023)*¹ and features five steps, which are summarized below:

1. Establish or review a School Route Plan;
2. Select an appropriate SZSL;
3. Identify if an engineering and traffic (E&T) investigation is needed and if additional safety and speed management countermeasures should be considered;
4. Design the school zone; and
5. Implementation.

The first step in the school zone speed limit study process was to evaluate the study location's existing school route plan, which was provided by Emerald Trail Elementary School for the 2025-2026 school year and can be found in **Appendix C**. Designated school crosswalks are provided across the south leg of the intersection of Ardroe Ave and Carrakay Wy and across Bonaire Path W, roughly 350' east of the intersection of Bonaire Path and Ardroe Ave.

According to school officials, designated bus routes are provided for all students residing north of Bonaire Path, east of CSAH 73, and south of the railroad crossing. Students in these neighborhoods are

¹ [Guide to Establishing Speed Limits in School Zones – June 2023](#)

encouraged to commute either via bus or parents as there is not a designated school crossing on CSAH 73.

School Zone Speed Limit (SZSL) Selection

Selection of an appropriate school zone speed limit (SZSL) is based on four elements outlined in MnDOT's *A Guide to Establishing Speed Limits in School Zones (2023)*, which include the following and are listed below:

1. Selecting a SZSL that reduces severe injury and fatal crashes for vulnerable users;
2. Minimizing the speed differential (5-10 mph preferred, not to exceed 15 mph);
3. Using a SZSL buffer zone (a zone with an intermediate SZSL between higher and lower speed zones) or advance warning signage on high-speed roadways when the speed differential exceeds 15 mph; and
4. Redundancy with countermeasures to improve compliance and safety (such as changes in roadway geometry and enhanced signing).

Due to the high posted speed limit of 50 mph on CSAH 73, it was necessary to select a school zone speed limit that would reduce the speed limit such that a reduction in the probability and severity of crashes at the pedestrian crossing is achieved. However, best practices established in the MnDOT guidance recommend a preferred speed reduction for school zones of 5-10 mph, and no greater than 15 mph without additional countermeasures, such as speed buffer zones or advance warning signage. Additionally, school zone speed limits are recommended not to exceed 35 mph. A summary of best practices for SZSL selection is provided in the figure below.

Figure A – Appropriate SZSL ranges and requirements based on MN State Statute 169.14.5a and MnDOT identified best practices

EXIST. ROAD SPEED LIMIT	20	25	30	35	40	45	50	55	60	65
Range of School Zone Speed Limits										
15-mph SZSL	C1	C1	C3							
20-mph SZSL		C1	C1	C3	C3					
25-mph SZSL			C2	C2	C3	C3				
30-mph SZSL				C2	C2	C3	C3	C3	C3	
35-mph SZSL					C2	C2	C3	C3	C3	C3

Condition 1 (C1) Satisfies SZSL best practices • No E&T investigation required unless there is a history of non-motorist crashes • No SZSL buffer zone or advance warning signing required • Additional countermeasures should be considered if pedestrian safety is the justification of the SZSL	Condition 2 (C2) Satisfies one, but not all best practices • E&T investigation required • No SZSL buffer zone or advance warning signing required • Additional countermeasures should be considered regardless of crash history, if pedestrian safety is the justification for the SZSL	Condition 3 (C3) Does not satisfy any best practices without additional countermeasures and/or warnings • E&T investigation required • SZSL buffer zone or advance warning signing required • Additional countermeasures should be considered regardless of crash history	Summary of SZSL Best Practices: • Selecting a SZSL that reduces the risk of severe injury and fatal crashes for vulnerable users • Minimize differential between existing speed limit and SZSL (5-10 mph is best, no more than 15 mph) • Use of a SZSL buffer zone or advance warning signage when there is a 15 mph or more differential • Redundancy with additional countermeasures
---	--	--	--

Citing guidance established in MnDOT's *A Guide to Establishing Speed Limits in School Zones (2023)*, a 30-mph or 35-mph school zone speed limit is recommended for implementation at the study location. Due to both the 30-and-35-mph SZSLs falling under Condition 3 as shown in the figure above, an

Engineering and Traffic (E&T) investigation is required, as well as the addition of speed buffer zones or advanced warning signage.

Engineering and Traffic (E&T) Investigation

Based on the findings of the SZSL selection process in the previous section, an Engineering & Traffic (E&T) investigation was required, due to the existing conditions at the study location failing to satisfy all best practices outlined in MnDOT's *A Guide to Establishing Speed Limits in School Zones (2023)*. The elements recommended for review as part of the E&T investigation are listed below, which included the following observations and improvements for consideration:

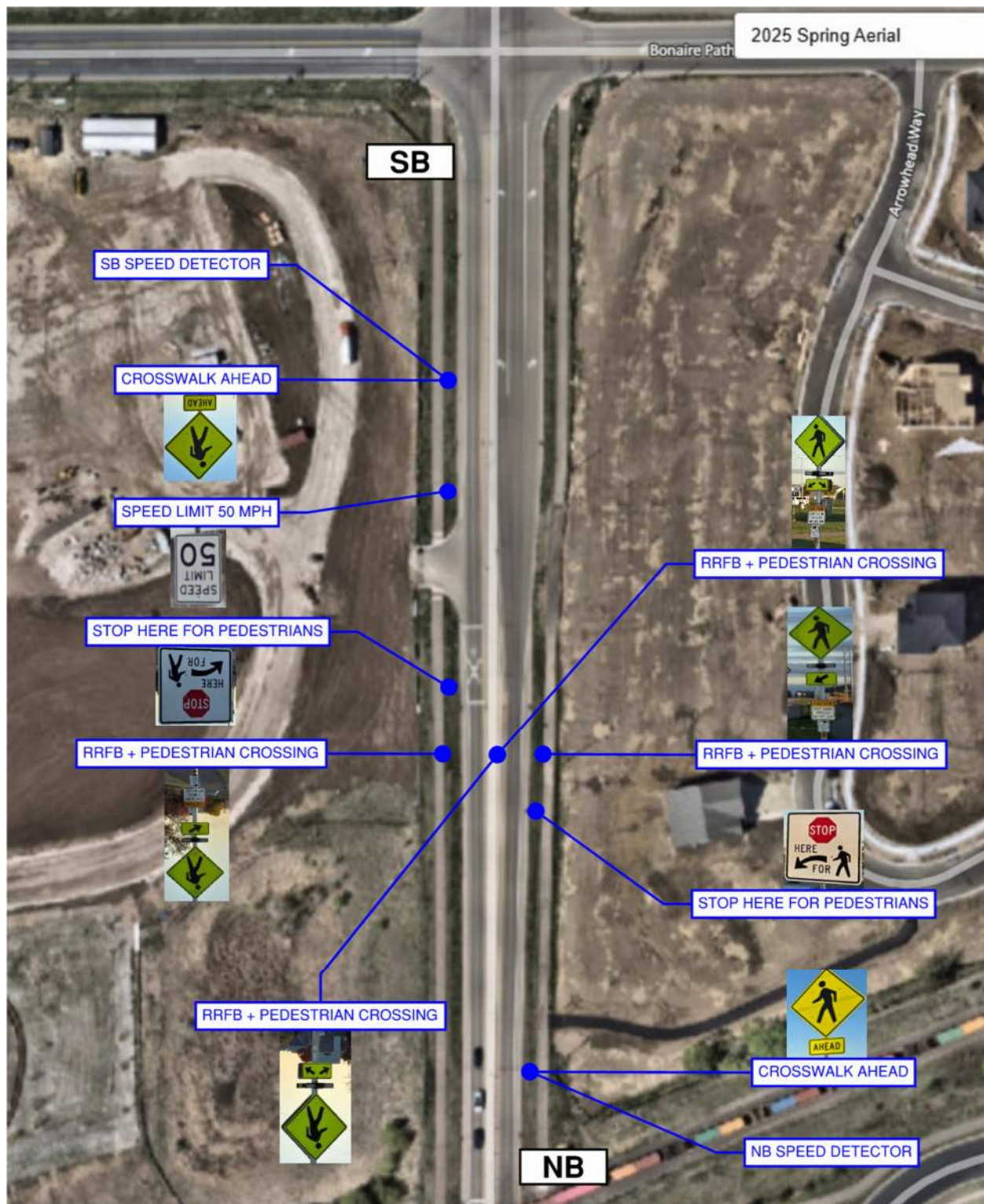
1. **Roadway geometry:** Uphill grade near railroad crossing on NB CSAH 73; no sightline limitations.
2. **Motor vehicle volumes:** See Appendix A.
3. **Non-motorist volumes:** See Appendix A.
4. **Traffic control devices and lighting:** RRFBs present at CSAH 73 pedestrian crossing. No lighting is present at the crossing.
5. **Parking and loading zones:** N/A.
6. **Sidewalks and Pedestrian Facilities:** Sidewalk present in both directions along CSAH 73. Marked crosswalks and ADA-compliant pedestrian ramps present at CSAH 73 pedestrian crossing.
7. **Speed study:** See "*Speed Analysis*" section below.
8. **Sight distance review:** See "*Sight Distance Analysis*" section below.
9. **Crash history:** The elementary school opened in fall of 2025. There is limited available crash history relating to school operations due to the recent opening, with no apparent crashes related to school operations occurring since the opening of the school. However, a review of crash data from the most recent 5-year period (2021-2025) found that there were nine total crashes within project limits, with eight of those being right-angle or left turn crashes occurring at the CSAH 73/Bonaire Path intersection, resulting in one serious injury. One pedestrian crash also occurred at the intersection which involved a pedestrian crossing the west leg of the intersection and a northbound left turning vehicle which failed to yield to the pedestrian; the crash resulted in minor injury to the pedestrian. Finally, the 5-year overall intersection crash rate of 1.103 crashes per million entering vehicles was found to be over seven times higher than the statewide average for intersections of similar characteristics (0.145). The resulting critical crash index was found to be 2.01, indicating the intersection is found to be operating above the expected safety range.
10. **Fencing and other barriers:** N/A.
11. **Obstructions and vegetation:** N/A.
12. **Land use and pedestrian generators:** Emerald Trail Elementary School.
13. **Roadway classification:** Major Collector.
14. **Student enrollment/modal mix:** K-5.
15. **Other (Railroad crossing):** Railroad crossing present roughly 350' south of the CSAH 73 pedestrian crossing. No additional issues (i.e., sightlines, inadequate sign spacing, etc.) were found to be associated with the railroad crossing.

Data Collection

Turning movement count data was collected at the intersection of CSAH 73 and Bonaire Path on Wednesday, September 10th, 2025, for a 24-hour period. The data was provided by Dakota County and counted passenger cars, trucks, pedestrians, and bicycles at the intersection. The weather was clear and did not impact visibility of the intersection. No detours were present in or around the study area.

95 pedestrians and cyclists were found to cross the intersection during the 24-hour period. 35 of these were observed crossing the east leg of the intersection, and 53 crossing the west leg of the intersection. Count data is provided in **Appendix A**.

In addition to turning movement count data, northbound and southbound vehicle speed data along CSAH 73 was collected via radar detection. This data was collected over a 24-hour period (8:30 AM to 8:30 AM), beginning Thursday, October 23rd and ending Friday, October 24th, 2025. The data recorded vehicle speed and directionality with a time stamp to the second. Two recording devices were used to collect the speed data, which were set up on the south leg approximately 750 and 250 feet south of the cross street for the northbound and southbound movements, respectively.



Data was collected during the weekdays for both traffic counts and vehicle speed, with all data being collected while Emerald Trail Elementary was in-session. School hours are from 9:30 AM to 3:50 PM according to the school's website.

Speed Analysis

Overall CSAH 73 vehicle speed data for northbound and southbound traffic is presented in **Table 1**, below.

Table 1: Speed Data Summary

Direction	Posted Speed Limit (mph)	Average Speed (mph)	85th Percentile Speed (mph)	10-mph Pace
Northbound	50	43.1	49	39-49
Southbound	50	44.9	52	41-51
Overall	N/A	44.0	51	40-50

Most notably, the study finds that the average, 85th percentile, and 10-mph pace speeds on the southbound approach are approximately 2 to 3 mph higher overall than those on the northbound approach. This is likely due to multiple factors, including the presence of a railroad crossing roughly 125 feet south of the northbound speed radar location, as well as an uphill grade in the northbound direction prior to the railroad crossing. Note, raw speed data collected by the southbound data collection device was edited to filter out vehicles turning right from eastbound Bonaire Path as these vehicles would still be accelerating at the time of passing the sensor and therefore not be representative of free-flow southbound speeds. No additional raw speed data was omitted from the speed analysis.

Sight Distance Analysis

A review of driver sight distance at the existing pedestrian crossing was performed to determine appropriate locations for establishing a school speed zone along the CSAH 73 corridor, including available sight distance and stopping sight distance, using guidance provided in MnDOT's *Facility Design Guide (2023)*². Available sight distance estimates the maximum distance an object can be seen unobstructed, while stopping sight distance (SSD) is the minimum distance required for a vehicle traveling at speed to come to a full stop, which includes the sum of driver reaction time to decide stopping and the physical act of stopping the vehicle at speed. Available sight distance was determined in the field as the greatest distance in which a point at the respective northbound and southbound RRFB locations, 2.0 feet above the crosswalk, was visible from a driver's eye height of 3.5 feet above the pavement, while SSD was calculated using 85th percentile vehicle speeds. The available and stopping sight distance results are summarized below in **Table 2**.

Table 2: Sight Distance at Pedestrian Crossing Summary

Direction	Posted Speed Limit (mph)	85th Percentile Speed (mph)	Available Sight Distance (ft)	Stopping Sight Distance (ft)
Northbound	50	49	500	410
Southbound	50	52	1,000+	450

The results find that there is sufficient available sight distance for both northbound and southbound vehicles to stop safely at the pedestrian crossing.

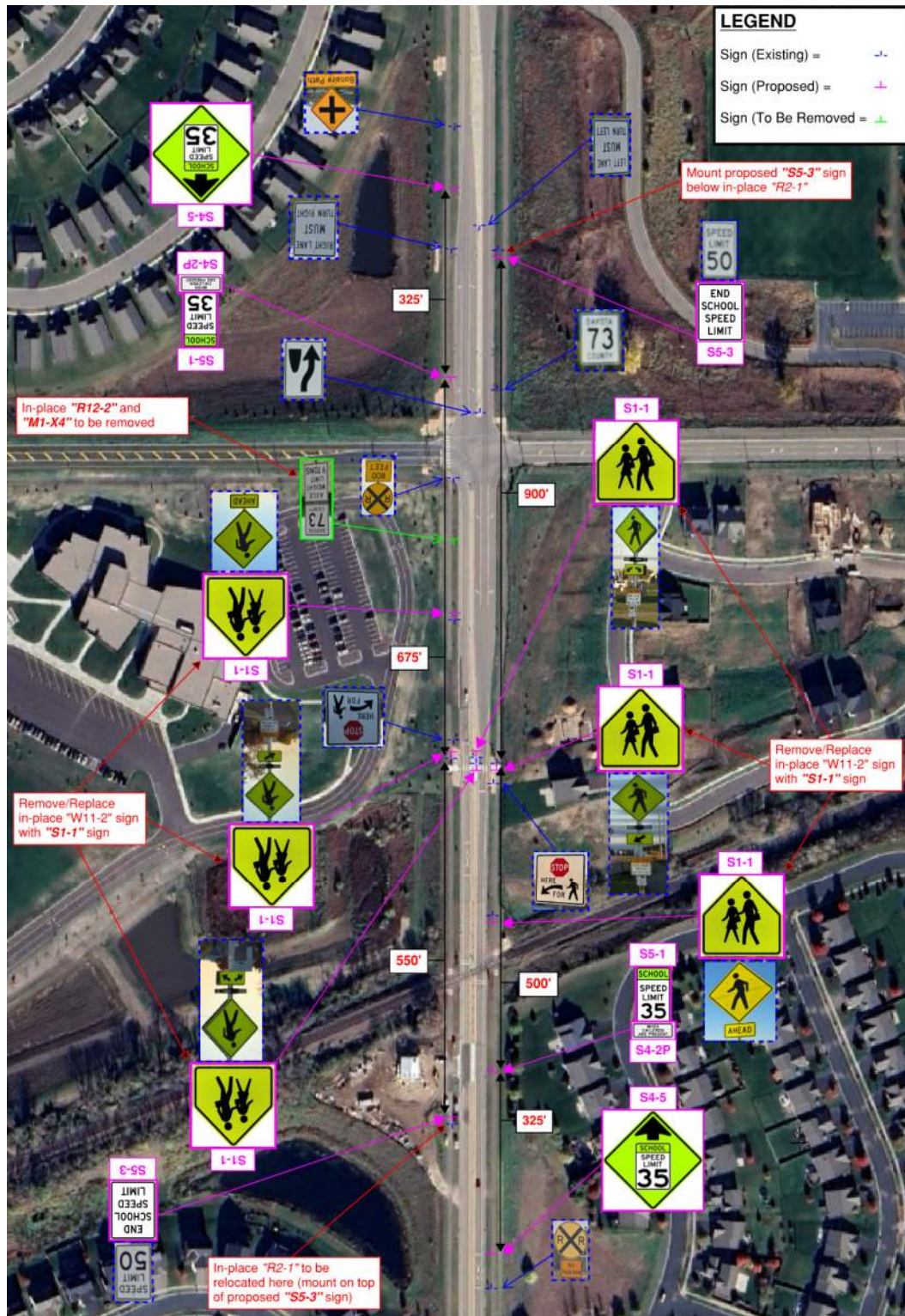
School Zone Speed Limit (SZSL) Design

The selection of an appropriate design for the school speed zone considered the study location's existing conditions and MnDOT best practices. Additionally, guidance from the 2024 MN MUTCD³ were used.

² [MnDOT Facility Design Guide – June 2023](#)

³ [Minnesota MUTCD – October 2025](#)

Section 7B.16 of the MN MUTCD states that “a Reduced School Speed Limit Ahead (S4-5 or S4-5a) sign should be used to inform road users of a reduced speed zone when the speed limit is being reduced by more than 10 mph or when engineering judgement indicates.” The recommended school design is provided in the figure below.



Note, school speed zone signage with S4-2P (WHEN CHILDREN ARE PRESENT) signs are included in the design shown above in order to improve visibility to the speed zone buffer zone. This approach is adopted from Texas DOT as summarized in MnDOT guidance.

An alternative design would omit the S4-2P signs in lieu of S4-1P signage which would list the time of day the school speed zone is in effect. MnDOT guidance notes that text size on these signs is often difficult for drivers to read and can be ineffective at high speeds. S1-1 and W16-9P signage in advance of the S4-5 signs have not been included in the plan for installation, due to the need to maintain optimal spacing between signs and reduce sign clutter. While MnMUTCD require said signs prior to a reduced school zone speed limit, engineering judgement was used to determine the S4-5 advance warning sign met the intent of the requirement for this context and remains in alignment with Appendix E of the MnDOT School Zone Speed Limit Guide. Additionally, school speed zone signage with flashing beacons have not been included in the design due to additional maintenance resources that would be required to operate and maintain the flashing beacons.

Limitations

Due to the placement of the southbound radar speed detector within close proximity to the CSAH 73 and Bonaire Path intersection, some vehicle speeds recorded may be slower due to vehicle deceleration and acceleration associated with turns from Bonaire onto CSAH 73. Approximately 54% of southbound traffic recorded a speed of less than 35 mph over the 24-hour period. Given the probability that many of these lower speeds were due to turning movements and were not an accurate representation of overall vehicle speeds, all counts under 35 mph were removed from the data set.

Conclusions

The performed study found that average, 85th percentile, and 10-mph pace vehicle speeds were slightly lower on the northbound approach at the study location. Pedestrian crossings over the 24-hour count period were found to be highest on the west and east legs of the intersection, respectively. The availability of sight distance approaching the pedestrian crossing was found to exceed the minimum required stopping sight distance (SSD) on both the northbound and southbound approaches. A 35-mph school speed zone is recommended for the study segment to improve safety for vehicles and pedestrians traveling the area when children may be present.

Appendix A: Turning Movement Count and Speed Data

ALLIANT ENGINEERING, INC.

733 S Marquette Ave #700, Minneapolis, MN 55402

Intersection: CSAH 73 (Akron Avenue) & Bonaire Path
Date: 9/10/2025
Duration: 0000-2400

Site Code: 43
Ref Pt: N/A
Page No: 1 of 5

All Vehicles (Cars & Trucks) Printed

Start Time	CSAH 73 (Akron Avenue) Southbound						Bonaire Path Westbound						CSAH 73 (Akron Avenue) Northbound						Bonaire Path Eastbound						Int. Veh. Total	Int. Ped/ Bike Total
	U-Turn	Left	Thru	Right	App. Total	Peds/ Bikes	U-Turn	Left	Thru	Right	App. Total	Peds/ Bikes	U-Turn	Left	Thru	Right	App. Total	Peds/ Bikes	U-Turn	Left	Thru	Right	App. Total	Peds/ Bikes	Int. Veh. Total	Int. Ped/ Bike Total
0:00	--	--	--	--	0	--	--	--	--	--	0	--	--	3	1	--	4	--	--	1	--	2	3	--	7	--
0:15	--	--	--	--	0	--	--	--	--	--	0	--	--	2	--	1	3	--	--	1	2	1	4	--	7	--
0:30	--	--	--	--	0	--	--	--	1	--	1	--	--	--	--	--	0	--	--	--	--	--	0	--	1	--
0:45	--	--	1	--	1	--	--	--	--	--	0	--	--	1	--	--	1	--	--	--	1	--	1	--	3	--
Hour Total	--	--	1	--	1	--	--	--	1	--	1	--	--	6	1	1	8	--	--	2	3	3	8	--	18	--
1:00	--	--	--	--	0	--	--	--	--	--	0	--	--	1	--	--	1	--	--	--	--	--	0	--	1	--
1:15	--	--	1	--	1	--	--	--	--	--	0	--	--	1	1	--	2	--	--	--	--	2	2	--	5	--
1:30	--	--	--	--	0	--	--	--	--	--	0	--	--	1	--	--	1	--	--	--	--	--	0	--	1	--
1:45	--	--	--	--	0	--	--	--	--	--	0	--	--	2	--	--	2	--	--	--	--	--	0	--	2	--
Hour Total	--	--	1	--	1	--	--	--	--	--	--	--	--	5	1	--	6	--	--	--	--	2	2	--	9	--
2:00	--	--	--	--	0	--	--	--	--	--	0	--	--	1	--	--	1	--	--	--	--	--	0	--	1	--
2:15	--	--	--	--	0	--	--	--	1	1	--	--	--	--	--	1	1	--	--	--	1	1	2	--	4	--
2:30	--	--	--	--	0	--	--	--	--	--	0	--	--	--	--	--	0	--	--	--	--	1	1	--	1	--
2:45	--	--	1	--	1	--	--	--	--	--	0	--	--	3	--	--	3	--	--	--	--	1	1	--	5	--
Hour Total	--	--	1	--	1	--	--	--	1	1	--	--	--	4	--	1	5	--	--	--	1	3	4	--	11	--
3:00	--	--	--	--	0	--	--	--	--	--	0	--	--	1	--	--	1	--	--	--	--	1	1	--	2	--
3:15	--	--	--	--	0	--	--	--	1	--	1	--	--	--	--	--	0	--	--	--	--	1	1	--	2	--
3:30	--	--	--	--	0	--	--	--	--	--	0	--	--	--	1	--	1	--	--	--	1	1	2	--	3	--
3:45	--	--	--	--	0	--	--	--	--	--	0	--	--	1	--	--	1	--	--	--	--	3	3	--	4	--
Hour Total	--	--	--	--	--	--	--	--	1	--	1	--	--	2	1	--	3	--	--	--	1	6	7	--	11	--
4:00	--	--	--	1	1	--	--	--	--	--	0	--	--	2	--	--	2	--	--	--	--	1	1	--	4	--
4:15	--	--	--	--	0	--	--	--	2	--	2	--	--	--	--	--	0	--	--	--	--	3	3	--	5	--
4:30	--	--	2	1	3	--	--	--	1	--	1	--	--	1	--	--	1	--	--	--	--	3	3	1	8	1
4:45	--	--	3	--	3	--	--	--	1	1	2	--	--	3	--	--	3	--	--	--	--	6	6	--	14	--
Hour Total	--	--	5	2	7	--	--	--	4	1	5	--	--	6	--	--	6	--	--	--	--	13	13	1	31	1
5:00	--	--	2	1	3	--	--	3	--	--	3	--	--	3	1	1	5	--	--	--	--	4	4	--	15	--
5:15	--	--	6	--	6	--	--	1	1	--	2	--	--	4	--	--	4	--	--	1	2	5	8	--	20	--
5:30	--	--	7	--	7	--	--	1	5	--	6	--	--	10	2	2	14	--	--	2	--	5	7	--	34	--
5:45	--	--	8	2	10	--	--	--	4	1	5	--	--	12	2	1	15	--	--	3	--	9	12	--	42	--
Hour Total	--	--	23	3	26	--	--	5	10	1	16	--	--	29	5	4	38	--	--	6	2	23	31	--	111	--
6:00	--	--	6	2	8	--	--	--	5	2	7	--	--	17	7	1	25	--	--	--	2	14	16	--	56	--
6:15	--	--	4	4	8	--	--	1	1	1	3	--	--	16	4	2	22	--	--	--	3	9	12	--	45	--
6:30	--	1	11	3	15	--	--	--	6	--	6	--	--	33	12	--	45	--	--	6	1	24	31	--	97	--
6:45	--	1	18	8	27	--	--	4	5	--	9	--	--	28	10	1	39	--	--	--	1	26	27	--	102	--
Hour Total	--	2	39	17	58	--	--	5	17	3	25	--	--	94	33	4	131	--	--	6	7	73	86	--	300	--
7:00	--	--	16	3	19	--	--	3	13	--	16	--	--	28	6	2	36	--	--	4	2	18	24	1	95	1
7:15	--	--	30	6	36	--	--	--	1	3	4	1	--	18	17	5	40	--	--	5	4	20	29	--	109	1
7:30	--	1	19	6	26	--	--	--	2	1	3	1	--	30	24	2	56	--	--	8	2	21	31	--	116	1
7:45	--	--	22	14	36	--	--	--	5	2	7	1	--	39	23	2	64	--	--	4	3	23	30	--	137	1
Hour Total	--	1	87	29	117	--	--	3	21	6	30	3	--	115	70	11	196	--	--	21	11	82	114	1	457	4
8:00	--	1	11	8	20	--	--	--	3	--	3	--	--	30	12	4	46	--	--	9	5	23	37	--	106	--
8:15	--	--	17	6	23	--	--	1	4	--	5	--	--	19	15	2	36	--	--	5	3	25	33	1	97	1
8:30	--	--	6	2	8	--	--	1	5	--	6	1	--	12	11	5	28	--	--	--	3	15	18	--	60	1
8:45	--	5	13	5	23	--	--	--	6	1	7	--	1	23	16	1	41	--	--	2	3	23	28	4	99	4
Hour Total	--	6	47	21	74	--	--	2	18	1	21	1	1	84	54	12	151	--	--	16	14	86	116	5	362	6
9:00	--	2	15	7	24	--	--	--	7	2	9	--	--	34	5	--	39	--	--	--	4	14	18	1	90	1
9:15	--	1	10	4	15	--	--	4	6	2	12	--	--	42	9	2	53	--	--	3	--	63	66	--	146	--
9:30	--	1	12	4	17	--	--	1	4	1	6	--	--	17	6	2	25	--	--	2	1	23	26	--	74	--
9:45	--	--	15	1	16	--	--	2	4	--	6	--	1	12	12	1	26	--	--	2	2	21	25	--	73	--
Hour Total	--	4	52	16	72	--	--	7	21	5	33	--	1	105	32	5	143	--	--	7	7	121	135	1	383	1
10:00	--	2	8	2	12	--	--	4	4	--	8	--	--	20	11	1	32	--	--	3	--	6	9	--	61	--
10:15	--	1	6	1	8	--	--	1	2	1	4	--	--	23	12	3	38	--	--	1	4	18	23	4	73	4
10:30	--	--	5	3	8	--	--	4	7	2	13	--	--	24	10	--	34	--	--	3	--	11	14	--	69	--
10:45	--	1	14	3	18	--	--	1	4	3	8	--	--	19	15	2	36	--	--	2	3	18	23	--	85	--
Hour Total	--	4	33	9	46	--	--	10	17	6	33	--	--	86	48	6	140	--	--	9	7	53	69	4	288	4
11:00	--	--	6	1	7	--	--	--	2	1	3	--	--	20	8	1	29	--	--	1	--	19	20	--	59	--
11:15	--	--	10	--	10	--	--	1	--	1	2	--	3	13	7	1	24	--	--	2	2	10	14	--	50	--
11:30	--	2	10	3	15	--	--	1	2	1	4	--	--	24	9	1	34	--	--	1	--	10	11	--	64	--
11:45	--	--	7	5	12	--	--	1	2	--	3	--	--	14	18	2	34	--	--	3	3	15	21	2	70	2
Hour Total	--	2	33	9	44	--	--	3	6	3	12	--	3	71	42	5	121	--	--	7	5	54	66	2	243	2
12:00	--	--	15	--	15	1	--	4	5	--	9	2	2	21	14	2	39	--	--	3	4	21	28	2	91	5
12:15	--	2	15	4	21	--	--	2	3	--	5	--	1	19	16	--	36	--	--	1	5	21	27	--	89	--
12:30	--	--	10	1	11	--	--	--	2	1	3	--	--	17	14	2	33	--	--	1	4	21	26	--	73	--
12:45	--	--	14	1	15	1	--	2	2	--	4	--	--	19	10	4	33	--	--	--	5	15	20	1	72	2
Hour Total	--	2	54	6	62	2	--	8	12	1	21	2	3	76	54	8	141	--	--	5	18	78	101	3	325	7
13:00	--	--	5	2	7	--	--	2	1	1	4	--	--	31	11	3	45	--	--	1	4	17	22	1	78	1
13:15	--	--	10	2	12	--	--	1	4	1	6	2	--	15	17	1	33	--	--	1	1	21	23	--	74	2
13:30	--	1	11	6	18	--	--	--	2	--	2	--	--	25	12	2	39	--	--	1	2	13	16	--	75	--
13:45	--	--	10	--	10	--	--	1	--	2	3	2	1	25	20	3	49	--	--	2	4	24	30	--	92	2
Hour Total	--	1	36	10	47	--	--	4	7	4	15	4	1	96	60	9	166	--	--	5	11	75	91	1	319	5

ALLIANT ENGINEERING, INC.

733 S Marquette Ave #700, Minneapolis, MN 55402

Intersection: CSAH 73 (Akron Avenue) & Bonaire Path
Date: 9/10/2025
Duration: 0000-2400

Site Code: 43
Ref Pt: N/A
Page No: 2 of 5

All Vehicles (Cars & Trucks) Printed

	CSAH 73 (Akron Avenue) Southbound						Bonaire Path Westbound						CSAH 73 (Akron Avenue) Northbound						Bonaire Path Eastbound						Int. Veh. Total	Int. Ped/ Bike Total	
Start Time	U-Turn	Left	Thru	Right	App. Total	Peds/ Bikes	U-Turn	Left	Thru	Right	App. Total	Peds/ Bikes	U-Turn	Left	Thru	Right	App. Total	Peds/ Bikes	U-Turn	Left	Thru	Right	App. Total	Peds/ Bikes			
14:00	--	1	11	5	17	--	--	1	6	--	7	2	1	19	10	2	32	--	--	1	4	19	24	--	80	2	
14:15	--	--	11	4	15	--	--	3	6	1	10	--	--	19	21	2	42	--	--	2	2	20	24	--	91	--	
14:30	--	--	17	4	21	--	--	4	1	--	5	--	--	26	10	3	39	--	--	3	1	31	35	--	100	--	
14:45	--	1	16	5	22	--	--	2	1	--	3	--	--	22	18	--	40	--	--	3	4	24	31	1	96	1	
Hour Total	--	2	55	18	75	--	--	10	14	1	25	2	1	86	59	7	153	--	--	9	11	94	114	1	367	3	
15:00	--	--	15	3	18	--	--	2	2	--	4	--	--	22	17	1	40	--	--	4	5	20	29	--	91	--	
15:15	--	1	17	4	22	--	--	3	4	2	9	--	--	41	13	1	55	--	--	5	5	19	29	--	115	--	
15:30	--	--	11	8	19	--	--	3	8	--	11	--	--	54	20	2	76	--	1	12	3	25	41	--	147	--	
15:45	--	2	25	6	33	--	--	--	5	--	5	--	1	27	22	4	54	--	--	4	9	69	82	--	174	--	
Hour Total	--	3	68	21	92	--	--	8	19	2	29	--	1	144	72	8	225	--	1	25	22	133	181	--	527	--	
16:00	--	2	28	7	37	--	--	2	6	1	9	--	--	35	17	1	53	--	--	7	8	37	52	1	151	1	
16:15	--	2	18	4	24	--	--	7	5	1	13	--	--	32	29	2	63	--	--	8	10	45	63	1	163	1	
16:30	--	1	14	11	26	--	--	3	4	2	9	1	--	33	27	1	61	--	--	3	9	41	53	1	149	2	
16:45	--	--	24	6	30	--	--	3	2	1	6	1	--	23	25	3	51	--	--	6	7	44	57	1	144	2	
Hour Total	--	5	84	28	117	--	--	15	17	5	37	2	--	123	98	7	228	--	--	24	34	167	225	4	607	6	
17:00	--	1	11	10	22	1	--	2	4	1	7	--	--	30	21	4	55	--	--	12	11	30	53	--	137	1	
17:15	--	3	21	7	31	--	--	8	8	3	19	--	--	32	17	7	56	--	--	5	6	43	54	4	160	4	
17:30	--	--	18	7	25	--	--	9	6	1	16	3	--	31	20	3	54	--	--	2	4	17	23	2	118	5	
17:45	--	4	23	4	31	--	--	8	5	1	14	3	--	26	12	2	40	--	--	5	3	25	33	--	118	3	
Hour Total	--	8	73	28	109	1	--	27	23	6	56	6	--	119	70	16	205	--	--	24	24	115	163	6	533	13	
18:00	--	--	16	7	23	--	--	1	4	2	7	1	--	21	19	5	45	--	--	6	3	27	36	4	111	5	
18:15	--	--	19	8	27	--	--	1	2	1	4	1	--	18	32	2	52	--	--	3	2	31	36	--	119	1	
18:30	--	--	18	4	22	--	--	1	4	--	5	2	--	19	20	7	46	--	--	3	8	18	29	8	102	10	
18:45	--	3	8	3	14	2	--	3	3	1	7	1	--	13	26	5	44	1	--	2	8	14	24	6	89	10	
Hour Total	--	3	61	22	86	2	--	6	13	4	23	5	--	71	97	19	187	1	--	14	21	90	125	18	421	26	
19:00	--	1	11	3	15	--	--	9	4	6	19	4	--	15	30	3	48	1	--	2	8	22	32	--	114	5	
19:15	--	2	12	3	17	--	--	2	2	1	5	2	--	16	14	2	32	--	--	4	5	23	32	--	86	2	
19:30	--	4	5	--	9	--	--	5	4	5	14	3	--	15	14	5	34	--	--	5	6	16	27	4	84	7	
19:45	--	--	12	3	15	--	--	5	4	7	16	--	--	16	11	5	32	--	--	3	1	15	19	--	82	--	
Hour Total	--	7	40	9	56	--	--	21	14	19	54	9	--	62	69	15	146	1	--	14	20	76	110	4	366	14	
20:00	--	1	18	2	21	--	--	2	5	--	7	--	--	11	10	2	23	--	--	1	7	13	21	1	72	1	
20:15	--	1	18	3	22	--	--	--	3	--	3	1	--	11	21	1	33	--	--	3	3	17	23	--	81	1	
20:30	--	--	6	2	8	--	--	2	1	--	3	--	--	8	12	1	21	--	--	--	3	8	11	--	43	--	
20:45	--	2	5	2	9	--	--	2	1	--	3	--	--	10	17	1	28	--	--	2	2	21	25	--	65	--	
Hour Total	--	4	47	9	60	--	--	6	10	--	16	1	--	40	60	5	105	--	--	6	15	59	80	1	261	2	
21:00	--	--	9	1	10	--	--	1	1	--	2	--	--	8	6	4	18	--	--	2	3	20	25	1	55	1	
21:15	--	--	3	1	4	--	--	--	1	--	1	--	1	10	12	1	24	--	--	2	--	8	10	--	39	--	
21:30	--	1	4	1	6	--	--	--	--	--	0	--	--	10	7	2	19	--	--	3	2	10	15	--	40	--	
21:45	--	1	7	--	8	--	--	1	1	--	2	--	1	8	3	1	13	--	--	--	--	6	6	--	29	--	
Hour Total	--	2	23	3	28	--	--	2	3	--	5	--	2	36	28	8	74	--	--	7	5	44	56	1	163	1	
22:00	--	1	5	1	7	--	--	--	1	2	3	--	--	8	6	1	15	--	--	1	1	8	10	--	35	--	
22:15	--	--	3	1	4	--	--	--	--	--	0	--	--	2	2	--	4	--	--	1	--	10	11	--	19	--	
22:30	--	--	1	--	1	--	--	1	--	--	1	--	--	3	4	2	9	--	--	1	1	5	7	--	18	--	
22:45	--	--	2	--	2	--	--	--	--	1	1	--	--	6	3	--	9	--	--	2	1	5	8	--	20	--	
Hour Total	--	1	11	2	14	--	--	1	1	3	5	--	--	19	15	3	37	--	--	5	3	28	36	--	92	--	
23:00	--	--	2	--	2	--	--	--	1	1	2	--	--	7	3	1	11	--	--	--	1	3	4	--	19	--	
23:15	--	1	3	--	4	--	--	--	--	--	0	--	--	--	3	--	3	--	--	--	2	--	2	--	9	--	
23:30	--	--	3	--	3	--	--	--	--	--	0	--	--	1	4	--	5	--	--	--	--	1	1	--	9	--	
23:45	--	--	2	--	2	--	--	--	--	1	1	--	--	2	3	--	5	--	--	--	--	5	5	--	13	--	
Grand Total	--	58	884	262	1204	5	--	143	250	74	467	35	--	13	1489	982	155	2639	2	1	212	245	1487	1945	53	6255	95
% of App.	0.0%	4.8%	73.4%	21.8%			0.0%	30.6%	53.5%	15.8%			0.5%	56.4%	37.2%	5.9%			0.1%	10.9%	12.6%	76.5%					
% of Total	0.0%	0.9%	14.1%	4.2%	19.2%	5.3%	0.0%	2.3%	4.0%	1.2%	7.5%	36.8%	0.2%	23.8%	15.7%	2.5%	42.2%	2.1%	0.0%	3.4%	3.9%	23.8%	31.1%	55.8%			
Cars Total	--	57	854	249	1160	4	--	141	240	73	454	31	--	13	1440	954	151	2558	2	1	201	238	1446	1886	39	6058	76
Cars % of Movement	0.0%	98.3%	96.6%	95.0%	96.3%	5.3%	0.0%	98.6%	96.0%	98.6%	97.2%	40.8%	100%	96.7%	97.1%	97.4%	96.9%	2.6%	100%	94.8%	97.1%	97.2%	97.0%	51.3%	96.9%		
Trucks Total	--	1	30	13	44	1	--	2	10	1	13	4	--	--	49	28	4	81	--	--	11	7	41	59	14	197	19
Trucks % of Movement	0.0%	1.7%	3.4%	5.0%	3.7%	5.3%	0.0%	1.4%	4.0%	1.4%	2.8%	21.1%	0.0%	3.3%	2.9%	2.6%	3.1%	0.0%	0.0%	5.2%	2.9%	2.8%	3.0%	73.7%	3.1%		

ALLIANT ENGINEERING, INC.

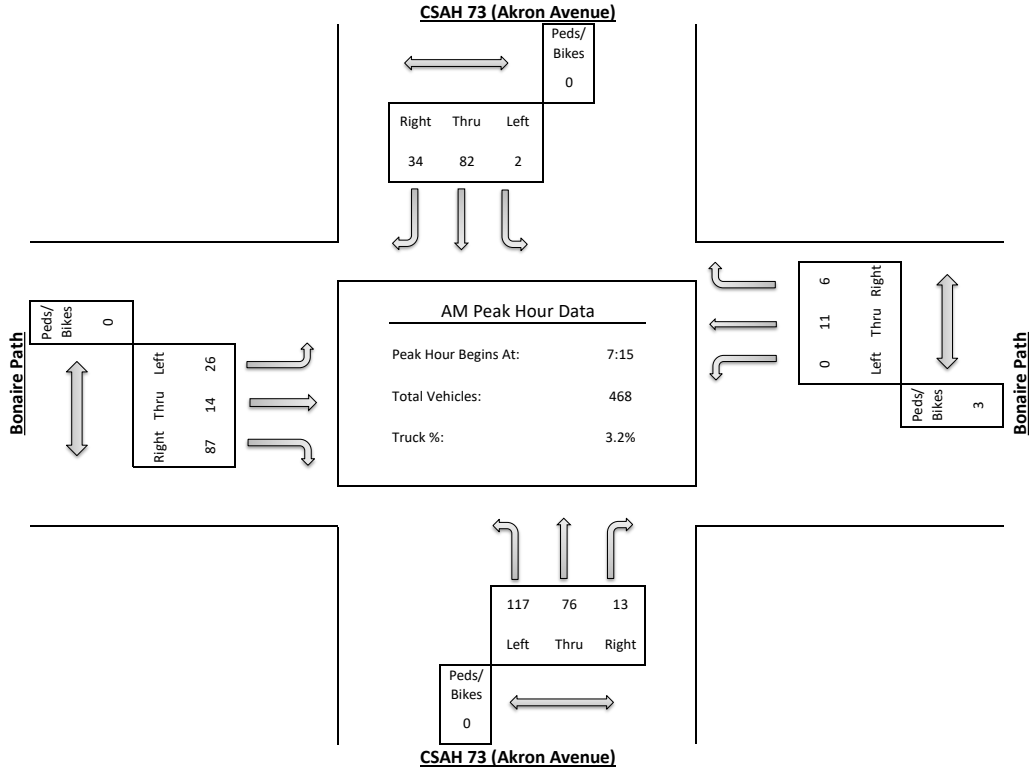
733 S Marquette Ave #700, Minneapolis, MN 55402

Intersection: CSAH 73 (Akron Avenue) & Bonaire Path
Date: 9/10/2025
Duration: 0000-2400

Site Code: 43
Ref Pt: N/A
Page No: 3 of 5

All Vehicles (Cars & Trucks) Printed

Start Time	CSAH 73 (Akron Avenue) Southbound						Bonaire Path Westbound						CSAH 73 (Akron Avenue) Northbound						Bonaire Path Eastbound						Int. Veh. Total	Int. Ped/Bike Total
	U-Turn	Left	Thru	Right	App. Total	Peds/Bikes	U-Turn	Left	Thru	Right	App. Total	Peds/Bikes	U-Turn	Left	Thru	Right	App. Total	Peds/Bikes	U-Turn	Left	Thru	Right	App. Total	Peds/Bikes		
7:15	--	--	30	6	36	--	--	--	1	3	4	1	--	18	17	5	40	--	--	5	4	20	29	--	109	1
7:30	--	1	19	6	26	--	--	--	2	1	3	1	--	30	24	2	56	--	--	8	2	21	31	--	116	1
7:45	--	--	22	14	36	--	--	--	5	2	7	1	--	39	23	2	64	--	--	4	3	23	30	--	137	1
8:00	--	1	11	8	20	--	--	--	3	--	3	--	--	30	12	4	46	--	--	9	5	23	37	--	106	--
Hour Total	--	2	82	34	118	--	--	--	11	6	17	3	--	117	76	13	206	--	--	26	14	87	127	--	468	3
% of App.	0.0%	1.7%	69.5%	28.8%			0.0%	0.0%	64.7%	35.3%			0.0%	56.8%	36.9%	6.3%			0.0%	20.5%	11.0%	68.5%				
% of Total	0.0%	0.4%	17.5%	7.3%	25.2%	0.0%	0.0%	0.0%	2.4%	1.3%	3.6%	100.0%	0.0%	25.0%	16.2%	2.8%	44.0%	0.0%	0.0%	5.6%	3.0%	18.6%	27.1%	0.0%		
Cars Total	--	2	76	33	111	--	--	--	11	6	17	3	--	115	74	13	202	--	--	23	14	86	123	--	453	3
Cars % of Movement	0.0%	100%	92.7%	97.1%	94.1%	0.0%	0.0%	0.0%	100%	100%	100%	100.0%	0.0%	98.3%	97.4%	100%	98.1%	0.0%	0.0%	88.5%	100%	98.9%	96.9%	0.0%	96.8%	
Trucks Total	--	--	6	1	7	--	--	--	--	--	0	--	--	2	2	--	4	--	--	3	--	1	4	--	15	--
Trucks % of Movement	0.0%	0.0%	7.3%	2.9%	5.9%	--	0.0%	0.0%	0.0%	0.0%	0.0%	--	0.0%	1.7%	2.6%	0.0%	1.9%	--	0.0%	11.5%	0.0%	1.1%	3.1%	--	3.2%	



ALLIANT ENGINEERING, INC.

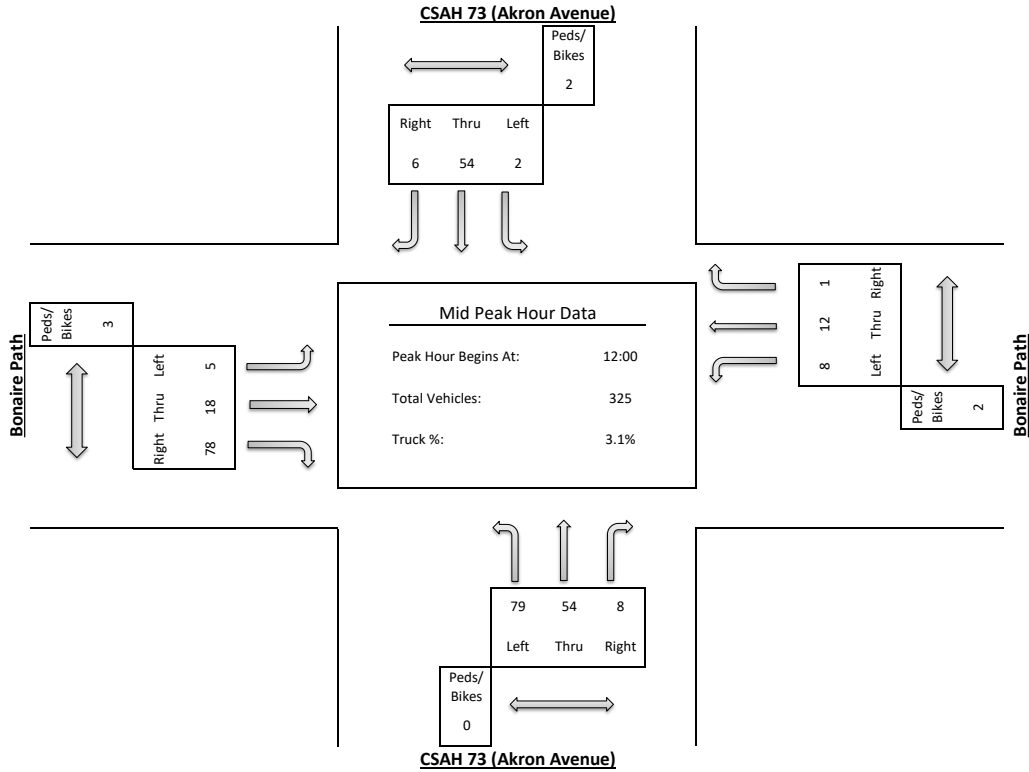
733 S Marquette Ave #700, Minneapolis, MN 55402

Intersection: CSAH 73 (Akron Avenue) & Bonaire Path
Date: 9/10/2025
Duration: 0000-2400

Site Code: 43
Ref Pt: N/A
Page No: 4 of 5

All Vehicles (Cars & Trucks) Printed

	CSAH 73 (Akron Avenue) Southbound						Bonaire Path Westbound						CSAH 73 (Akron Avenue) Northbound						Bonaire Path Eastbound						Int. Veh.	Int. Ped/
Start Time	U-Turn	Left	Thru	Right	App. Total	Peds/ Bikes	U-Turn	Left	Thru	Right	App. Total	Peds/ Bikes	U-Turn	Left	Thru	Right	App. Total	Peds/ Bikes	U-Turn	Left	Thru	Right	App. Total	Peds/ Bikes	Total	Bike Total
12:00	--	--	15	--	15	1	--	4	5	--	9	2	2	21	14	2	39	--	--	3	4	21	28	2	91	5
12:15	--	2	15	4	21	--	--	2	3	--	5	--	1	19	16	--	36	--	--	1	5	21	27	--	89	--
12:30	--	--	10	1	11	--	--	--	2	1	3	--	--	17	14	2	33	--	--	1	4	21	26	--	73	--
12:45	--	--	14	1	15	1	--	2	2	--	4	--	--	19	10	4	33	--	--	--	5	15	20	1	72	2
Hour Total	--	2	54	6	62	2	--	8	12	1	21	2	3	76	54	8	141	--	--	5	18	78	101	3	325	7
% of App.	0.0%	3.2%	87.1%	9.7%			0.0%	38.1%	57.1%	4.8%			2.1%	53.9%	38.3%	5.7%			0.0%	5.0%	17.8%	77.2%				
% of Total	0.0%	0.6%	16.6%	1.8%	19.1%	28.6%	0.0%	2.5%	3.7%	0.3%	6.5%	28.6%	0.0%	0.9%	23.4%	16.6%	2.5%	43.4%	0.0%	0.0%	1.5%	5.5%	24.0%	31.1%	42.9%	
Cars Total	--	2	50	6	58	1	--	8	11	1	20	2	3	76	53	8	140	--	--	5	18	74	97	2	315	5
Cars % of Movement	0.0%	100%	92.6%	100%	93.5%	20.0%	0.0%	100%	91.7%	100%	95.2%	40.0%	100%	100%	98.1%	100%	99.3%	0.0%	0.0%	100%	100%	94.9%	96.0%	40.0%	96.9%	
Trucks Total	--	--	4	--	4	1	--	--	1	--	1	--	--	--	1	--	1	--	--	--	--	4	4	1	10	2
Trucks % of Movement	0.0%	0.0%	7.4%	0.0%	6.5%	50.0%	0.0%	0.0%	8.3%	0.0%	4.8%	0.0%	0.0%	0.0%	1.9%	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%	5.1%	4.0%	50.0%	3.1%	



ALLIANT ENGINEERING, INC.

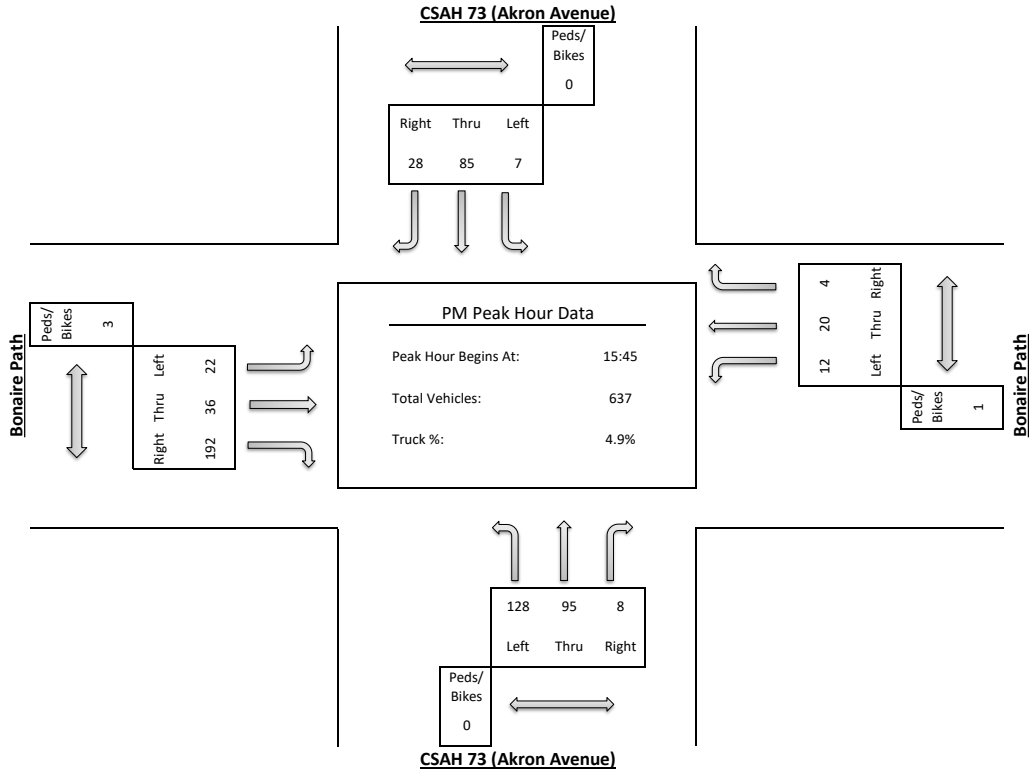
733 S Marquette Ave #700, Minneapolis, MN 55402

Intersection: CSAH 73 (Akron Avenue) & Bonaire Path
Date: 9/10/2025
Duration: 0000-2400

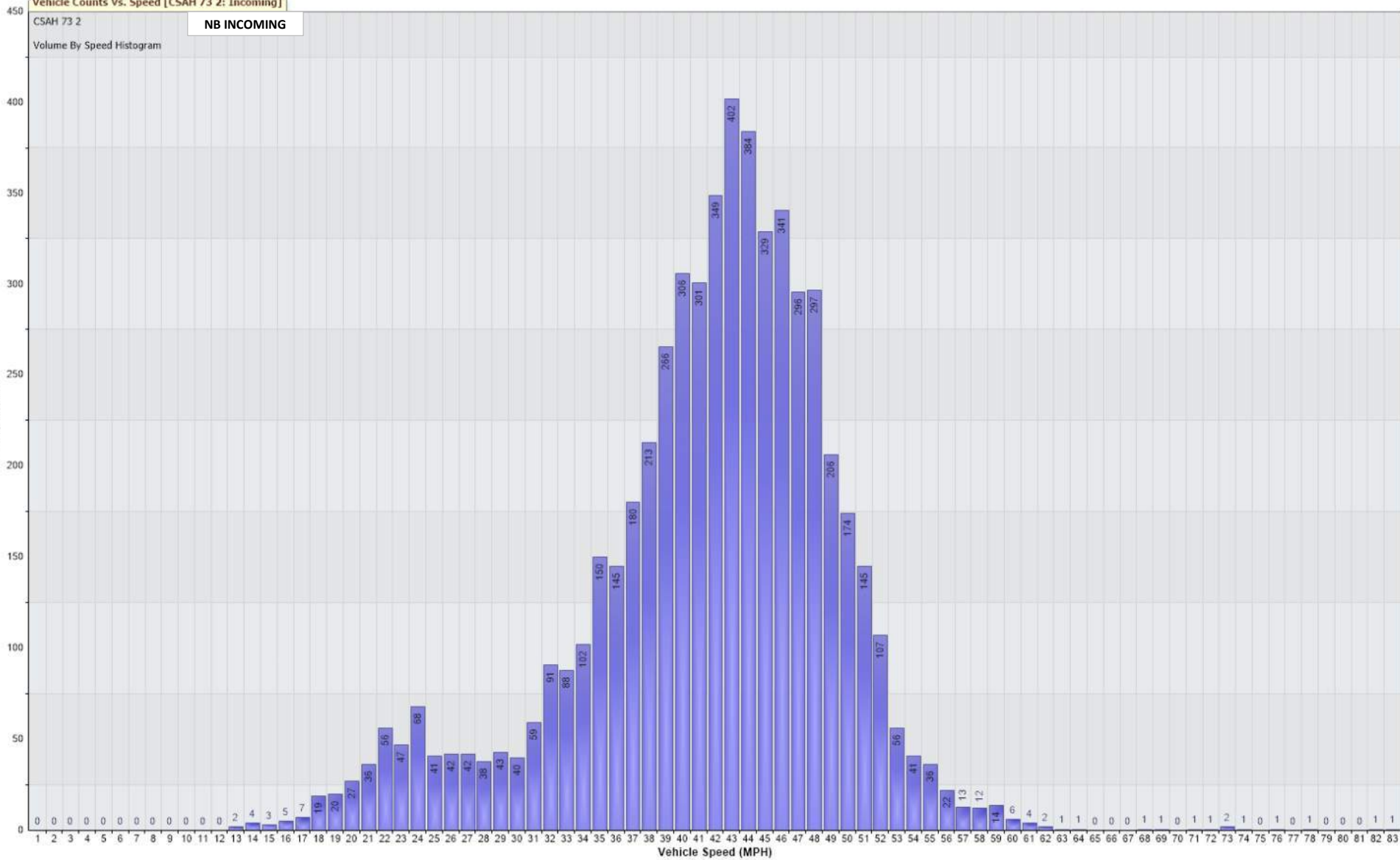
Site Code: 43
Ref Pt: N/A
Page No: 5 of 5

All Vehicles (Cars & Trucks) Printed

	CSAH 73 (Akron Avenue) Southbound						Bonaire Path Westbound						CSAH 73 (Akron Avenue) Northbound						Bonaire Path Eastbound						Int. Veh. Total	Int. Ped/ Bike Total
Start Time	U-Turn	Left	Thru	Right	App. Total	Peds/ Bikes	U-Turn	Left	Thru	Right	App. Total	Peds/ Bikes	U-Turn	Left	Thru	Right	App. Total	Peds/ Bikes	U-Turn	Left	Thru	Right	App. Total	Peds/ Bikes		
15:45	--	2	25	6	33	--	--	--	5	--	5	--	1	27	22	4	54	--	--	4	9	69	82	--	174	--
16:00	--	2	28	7	37	--	--	2	6	1	9	--	--	35	17	1	53	--	--	7	8	37	52	1	151	1
16:15	--	2	18	4	24	--	--	7	5	1	13	--	--	32	29	2	63	--	--	8	10	45	63	1	163	1
16:30	--	1	14	11	26	--	--	3	4	2	9	1	--	33	27	1	61	--	--	3	9	41	53	1	149	2
Hour Total	--	7	85	28	120	--	--	12	20	4	36	1	1	127	95	8	231	--	--	22	36	192	250	3	637	4
% of App.	0.0%	5.8%	70.8%	23.3%			0.0%	33.3%	55.6%	11.1%			0.4%	55.0%	41.1%	3.5%			0.0%	8.8%	14.4%	76.8%				
% of Total	0.0%	1.1%	13.3%	4.4%	18.8%	0.0%	0.0%	1.9%	3.1%	0.6%	5.7%	25.0%	0.2%	19.9%	14.9%	1.3%	36.3%	0.0%	0.0%	3.5%	5.7%	30.1%	39.2%	75.0%		
Cars Total	--	7	81	26	114	--	--	12	19	4	35	1	1	123	92	8	224	--	--	21	34	178	233	1	606	2
Cars % of Movement	0.0%	100%	95.3%	92.9%	95.0%	0.0%	0.0%	100%	95.0%	100%	97.2%	50.0%	100%	96.9%	96.8%	100%	97.0%	0.0%	0.0%	95.5%	94.4%	92.7%	93.2%	50.0%	95.1%	
Trucks Total	--	--	4	2	6	--	--	--	1	--	1	--	--	4	3	--	7	--	--	1	2	14	17	2	31	2
Trucks % of Movement	0.0%	0.0%	4.7%	7.1%	5.0%	0.0%	0.0%	0.0%	5.0%	0.0%	2.8%	0.0%	0.0%	3.1%	3.2%	0.0%	3.0%	0.0%	0.0%	4.5%	5.6%	7.3%	6.8%	100.0%	4.9%	



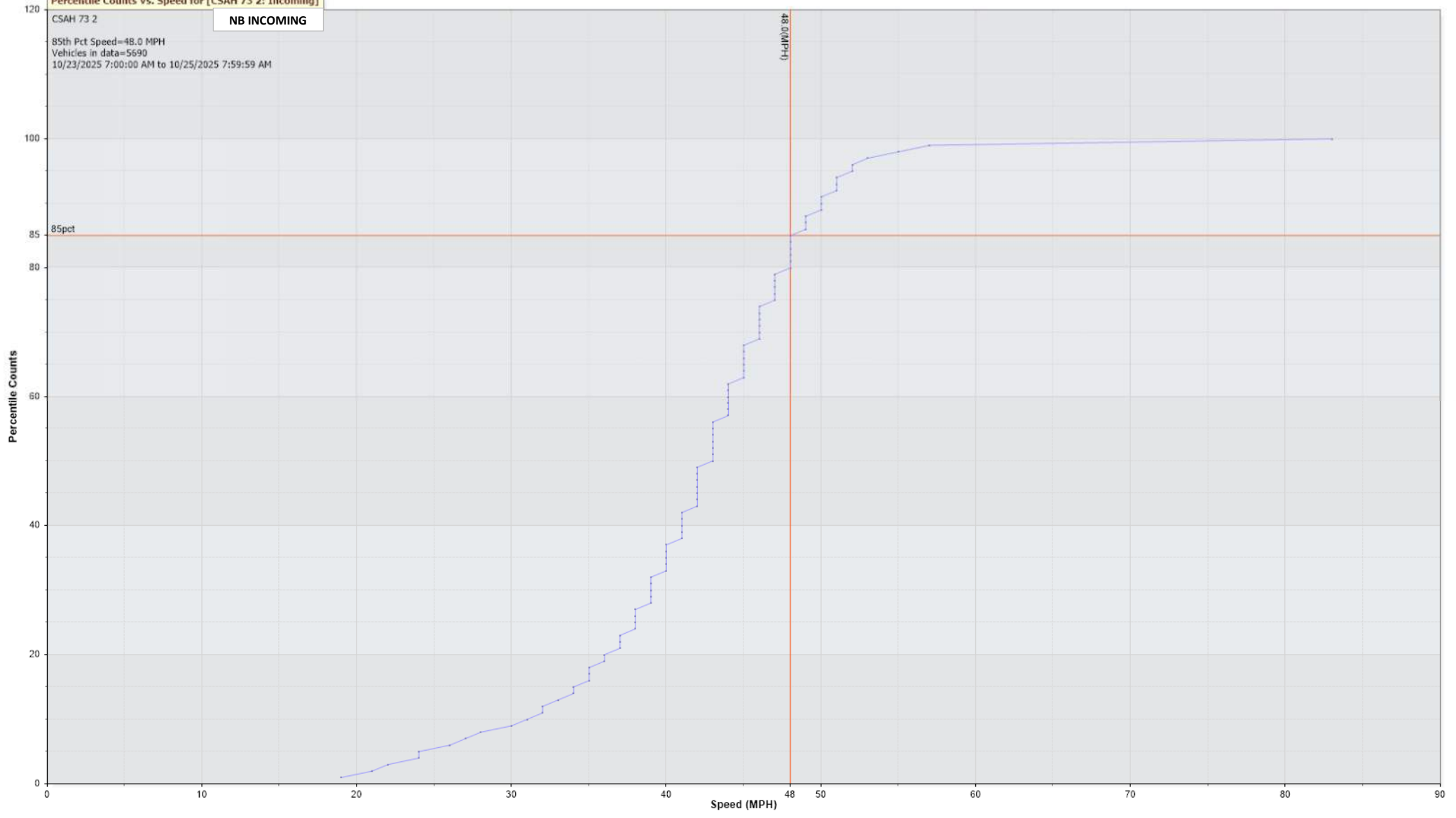
Vehicle Counts



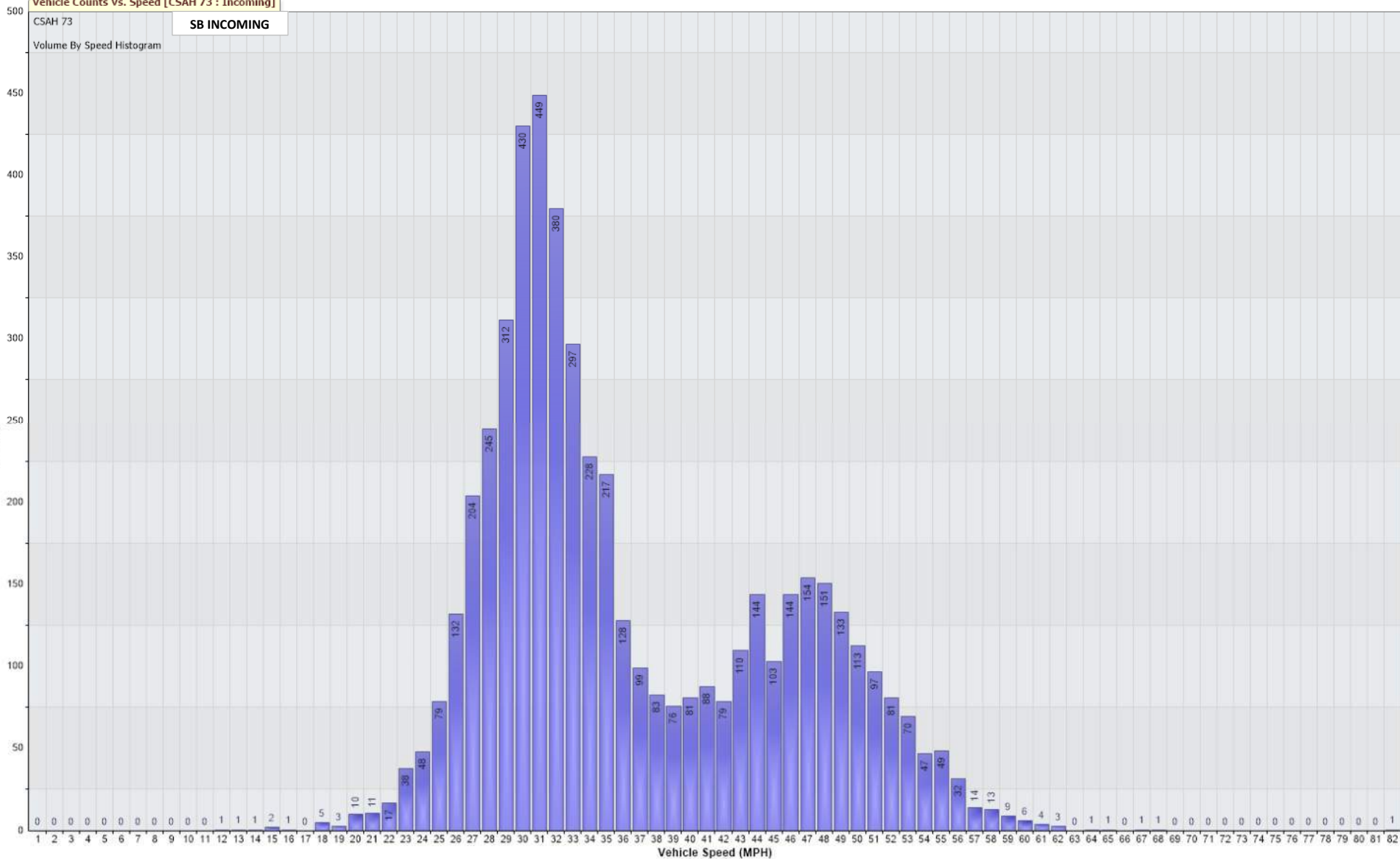
Percentile Counts Vs. Speed for [CSAH 73 2: Incoming]

CSAH 73 2
85th Pct Speed=48.0 MPH
Vehicles in data=5690
10/23/2025 7:00:00 AM to 10/25/2025 7:59:59 AM

NB INCOMING



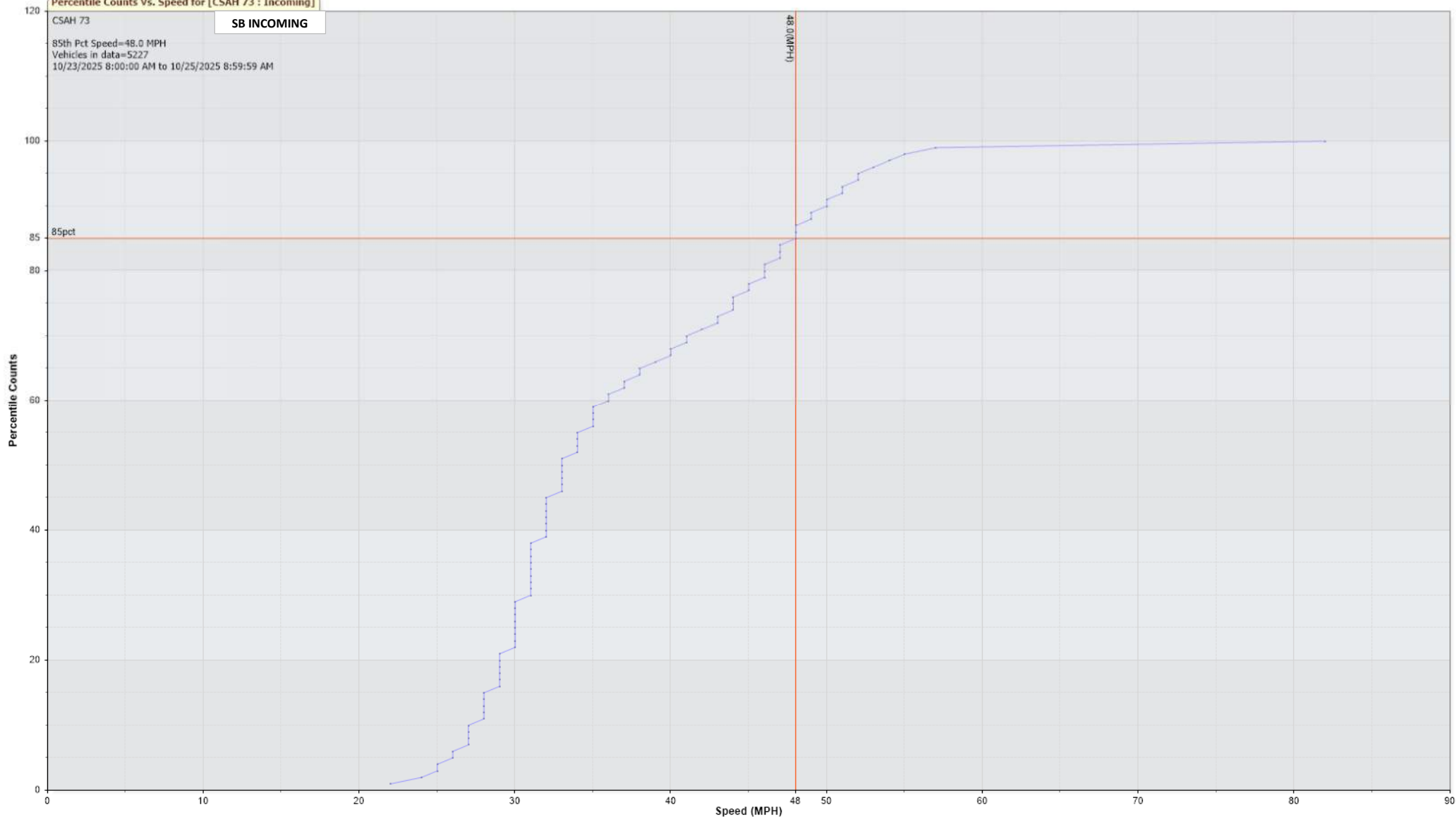
Vehicle Counts



Percentile Counts Vs. Speed for [CSAH 73 : Incoming]

CSAH 73
85th Pct Speed=48.0 MPH
Vehicles in data=5227
10/23/2025 8:00:00 AM to 10/25/2025 8:59:59 AM

SB INCOMING



Appendix B: MnDOT SZSL Reporting Worksheet

REPORTING WORKSHEET

School Zone Speed Limits (SZSLs)

This worksheet helps document the five-step process for setting a school zone speed limit (SZSL) as outlined in the 2023 *Guide for Establishing a School Zone Speed Limit*. The completion of this document is recommended for recording and reporting purposes. This information is *not* required to be completed or submitted to MnDOT for approval. Reporting of this information to MnDOT is voluntary and will be used to help the State track and evaluate how SZSLs are being applied throughout the state.

School Zone Information

School Name: _____

Grades: _____ Existing speed limit = _____ mph

☐ School Route Plan Attached

Existing speed management countermeasures: _____

3-5 Year Crash History

☐ No

☐ Yes, Explain: _____

Conditions Identified in Figure A of the *Guide for Establishing a SZSL*

The selected SZSL is _____ mph

☐ The selected SZSL is not lower than 15 mph* (or 20 mph on a trunk highway), AND

☐ The selected SZSL is not more than 30 mph* below the existing speed limit

* This information summarizes the existing Minnesota state statute (Statute 169.14.5a) for SZSLs at the time this document was published. It is the responsibility of the reader to review current state statutes when using this document to ensure that no changes have occurred after publication.

☐ Condition 1 –

Satisfies best practices

- No Engineering & Traffic Investigation required unless there is a history of non-motorist crashes
- Additional countermeasures are recommended if there is a history of non-motorist crashes or pedestrian safety is the justification for the SZSL
- No “Reduced Speed Limit Ahead” signs (S4-5 or S4-5a) or buffer SZSLs recommended

☐ Condition 2 –

Satisfies some, but not all best practices

- Engineering & Traffic Investigation required
- No “Reduced Speed Limit Ahead” or buffer SZSL recommended
- Additional countermeasures should be considered regardless of crash history, if pedestrian safety is the justification for the SZSL

☐ Condition 3 –

Does not satisfy best practices without additional countermeasures

- Engineering & Traffic Investigation required
- “Reduced Speed Limit Ahead” signs (S4-5 or S4-5a) or buffer SZSLs required
- Additional countermeasures should be considered regardless of crash history

APPENDIX D

Buffer Recommended

- ☐ No
- ☐ Yes. If so, identify buffer sign type and placement. _____

If an Engineering & Traffic Investigation was conducted, identify included elements

- ☐ Roadway geometry
- ☐ Motor vehicle volumes
- ☐ Non-motorist volumes
- ☐ Traffic control devices and lighting
- ☐ Parking and loading zones
- ☐ Sidewalks
- ☐ Crash history
- ☐ Fencing and other barriers
- ☐ Motor vehicle speed
- ☐ Obstructions and vegetation
- ☐ Land use and pedestrian generators

Other considerations

- ☐ Roadway classification
- ☐ Intersection spacing
- ☐ Driveway density
- ☐ Roadway owner
- ☐ Student enrollment/modal mix
- ☐ Other: _____

Complementary Countermeasures Selected:

- ☐ No
- ☐ Yes. If so, describe additional countermeasures selected and date of anticipated implementation:

Contact Information

Name of Roadway Authority: _____

Name of Roadway Authority Representative: _____

Signature: _____ Date: _____

Note: It's recommended that this document be signed by a duly certified professional engineer since SZSLs impact the health, safety, and welfare of the general public.

If you would like to participate in voluntary reporting to MnDOT, send the completed form to the [MnDOT Office of Traffic Engineering](mailto:traffic.dot@state.mn.us) at traffic.dot@state.mn.us.

Appendix C: School Route Plan

Emerald Trail Elementary School - School Route Plan

