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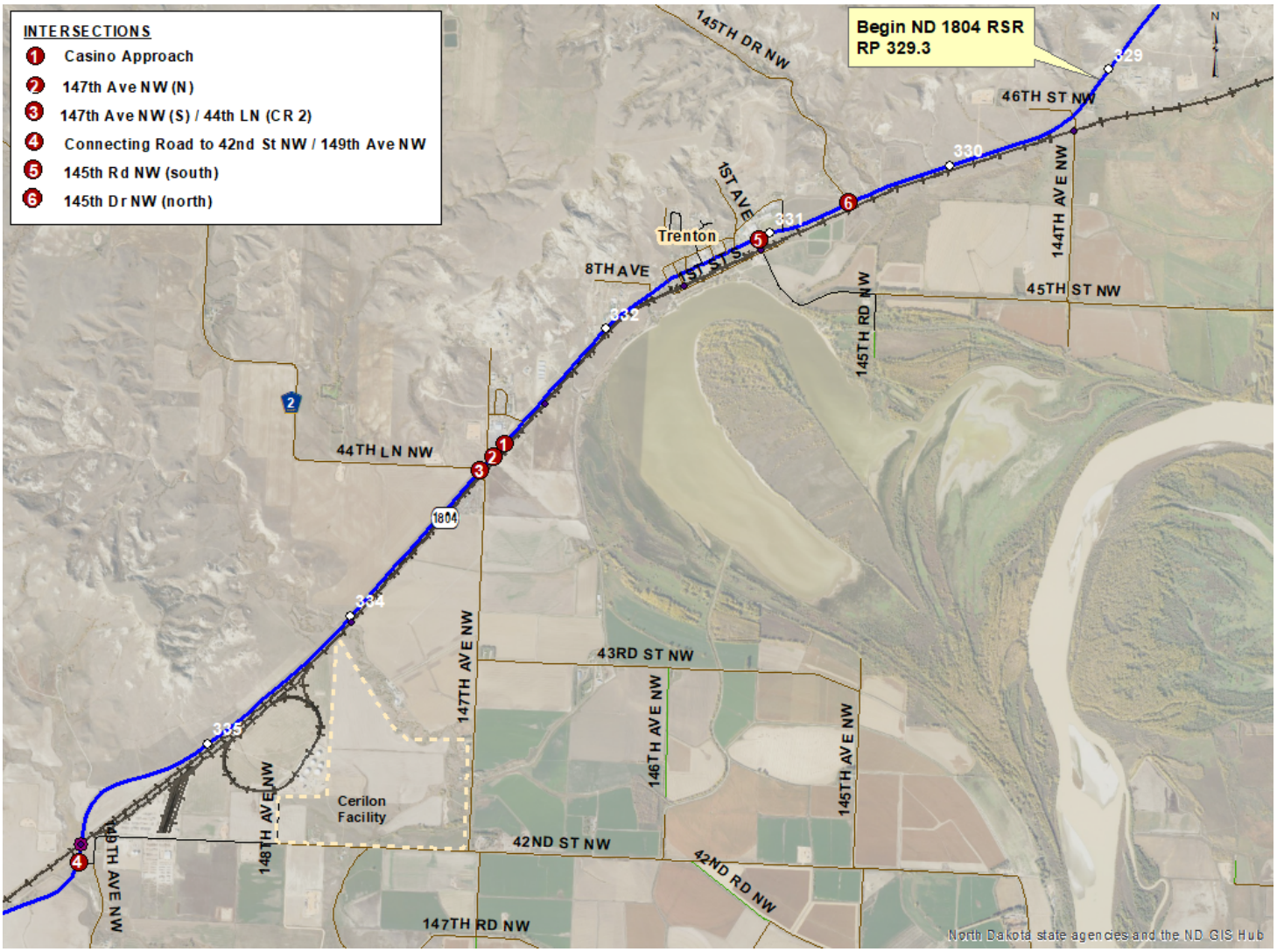
ROAD SAFETY REVIEW

PCN 24328, HSIP #724001

ND 1804 South of Jct US 2 RP 329.3 to Co Rd 5 RP 340.3



Prepared By:

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

PROGRAMMING DIVISION

TRAFFIC OPERATIONS SECTION

October 30, 2024

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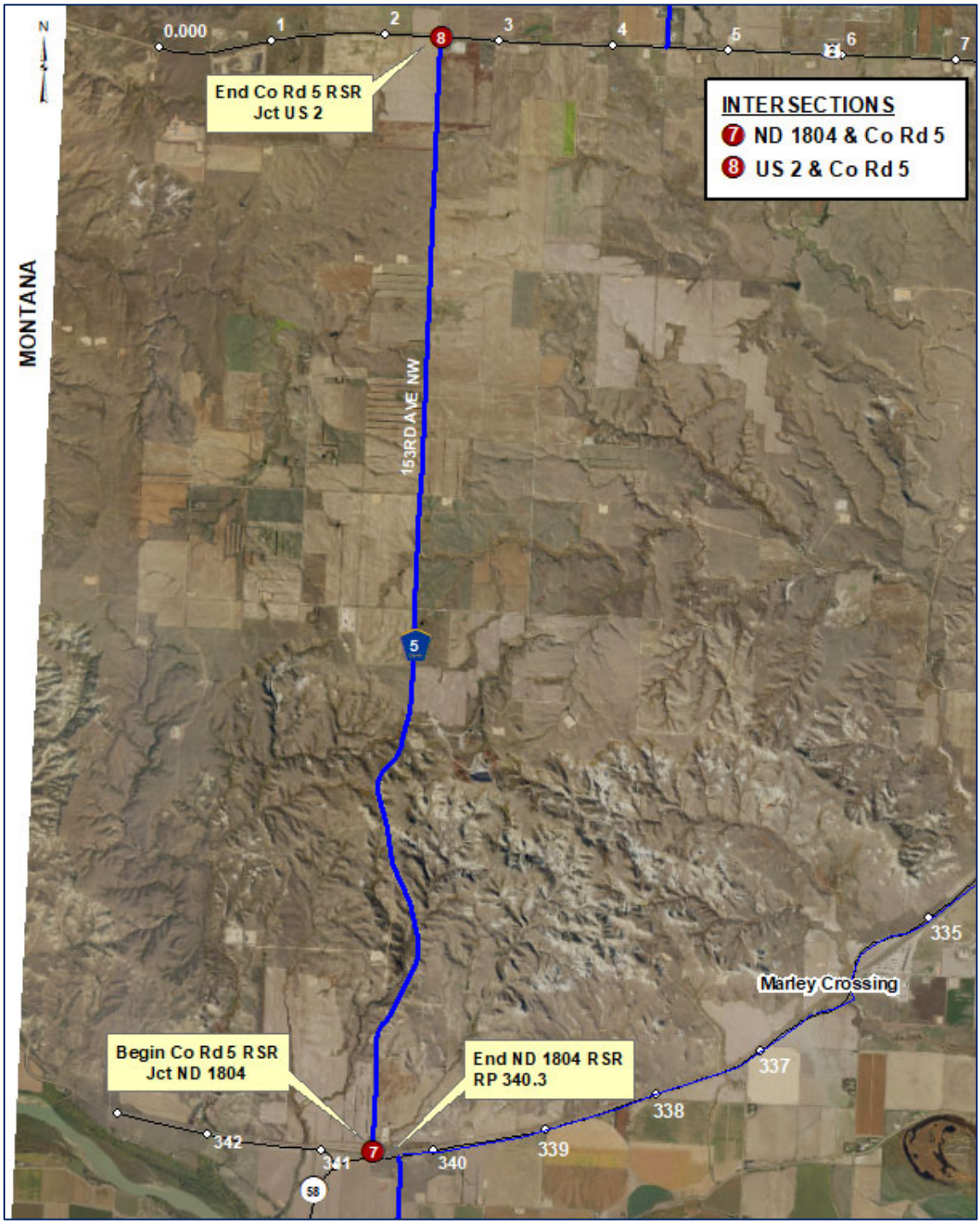
VISION ZERO
Zero fatalities. Zero excuses.

Williams County Road 5, Jct ND 1804 North to Jct US 2



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INTRODUCTION

A Road Safety Review (RSR) was conducted on 5/29/2024 for ND 1804 near Trenton, from RP 329.3 north of Trenton to RP 340.3 south of Marley Crossing. Attendees at the meeting are shown below. During discussions, it was determined to study Williams County Road 5 as a potential bypass road from the Jct of ND 1804 north to the Jct of US 2. The study locations for ND 1804 are shown on the cover sheet. Study locations for Co Rd 5 are shown on page i.

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ND 1804 is a north/south roadway. The highway through this segment runs northeast to southwest with reference points increasing to the southwest and likewise decreasing to the northeast. The analyses in this study are based on:

- NDDOT Design Manual
- NDDOT Traffic Operations Manual
- Highway Capacity Manual (7th Edition)
- Highway Capacity Software (2024)
- AASHTO Greenbook
- MUTCD (2023)
- NCHRP Speed Limit Setting Guidelines

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ND 1804, RP 329.3 north of Trenton to 340.3 south of Marley Crossing

Existing Conditions

Functional Classification: Major Collector
Performance Classification: State Corridor
Typical Section: (2) 12ft driving lanes, 6ft shoulders
2024 AADT:

RP	AADT	TAADT	% Trks
330.55	5030	904	17.97%
331.08	4956	909	18.34%
332.75	4556	886	19.45%
332.90	4043	884	21.86%
333.01	4043	884	21.86%
336.00	3927	1025	26.10%
340.57	4344	1306	30.06%

*Speed Limits : RP 329.300 to 330.775 – 65 MPH
RP 330.775 to 330.870 – 45 MPH
RP 330.870 to 331.781 – 25 MPH
RP 331.781 to 332.160 – 45 MPH
RP 332.160 to 335.360 – 65 MPH
RP 335.360 to 336.340 – 50 MPH
RP 336.340 to 340.570 – 65 MPH

***Refer to figure 3 for map of existing speed zones.**

Lighting: No lighting is in place throughout the segment.
Railroad: The BNSF railroad tracks cross ND 1804 south of Trenton at the Marley Crossing shown on the cover sheet. The railroad tracks parallel highway 1804 on the east from there going north.

CRASH HISTORY

Crash data was reviewed for the past 5yr period from 7-1-2019 to 6-30-2024. A total of twenty-nine crashes were reported during the time period. Of the total crashes, thirteen were rear end crashes. One incapacitating crash and two fatal crashes were reported. One fatal crash occurred in the 45mph zone south of Trenton when an eastbound vehicle crossed the centerline and stuck a westbound vehicle head on. The other fatal crash occurred near the RR tracks when a motorcycle attempted to pass a line of stopped vehicles at the tracks and failed to negotiate the curve. Speed was reportedly a contributing factor in the crash. The incapacitating crash occurred at 147th Ave NW when an eastbound vehicle attempted to pass a maintenance vehicle that was turning left.

The crash summary in figure 1 shows the crashes that occurred in each year of the past 5yr period. Figure 2 shows the number of crashes in the vision zero emphasis areas. The detailed crash information is in attachment 2.

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			Intersection?				Severity					Surface Conditions			Work Zone
Yr	Start Date	End Date	YES (or Alley / Drwy)	NO Single Veh	NO Mult. Veh	Total	K	A	B	C	O	Dry	Wet	Ice/Snow	
1	7/1/19	6/30/20		3	3	6					6	5		1	
2	7/1/20	6/30/21	1	2		3					3	2		1	
3	7/1/21	6/30/22	2	1	3	6			3	1	2	5		1	
4	7/1/22	6/30/23	2	3	3	8	2		1	2	3	6		2	
5	7/1/23	6/30/24	3	1	2	6		1	2	2	1	4		2	
			8 (27.6%)	10 (34.5%)	11 (37.9%)	29	2	1	6	5	15	22		7	

Figure 1 – Crash Summary

Vision Zero Emphasis Areas
8 Lane Departure Crashes
8 Intersection Crashes
1 Alcohol and/or Drug Related Crashes
5 Unbelted Vehicle Occupant Crashes
6 Speed Related Crashes
5 Young Driver Crashes

Figure 2 – Vision Zero – Crashes in Vision Zero Emphasis Areas

ROAD SAFETY MEEETING NOTES AND RECOMMENDATIONS

ND 1804, RP 329.3 to 340.3

Speed Limits

Speed limits entering the community are a concern since 20% of all traffic on the roadway through the study segment is comprised of large trucks. Several residential homes and businesses are spread out further to the south of Trenton. Ongoing commercial and new residential developments are being planned in the north part of Trenton. Speed zone modifications are based on crash data, the environment, speed study results, and safety consideration for all road users.

Speed zones from the northeast of Trenton to the Marley Crossing were analyzed with the exception of the 25mph zone through Trenton. Speed study locations and results are shown on the Speed Zone Engineering Study in attachment 2. Proposed speed zone modifications from the analysis of the study are shown on an aerial map on page 6.

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65 to 45 MPH Zones North of Trenton

Speed data captured at spot locations in the 65mph zone near 145th Dr NW and in the 45mph entering Trenton are shown below.

Speed Limit	Site #	85th % Speed (mph)		50th % Speed (mph)	
		NB	SB	NB	SB
65	1	70	69	62	60
45	2	47	50	38	42

The 85th percentile speed in both the 65 and 45 mph zones are within the expected ±5mph range of the posted speed. The recommended minimum length for a speed limit transition zone from a 65mph rural speed zone to a community speed zone of 25mph is 895ft. The length of the 45mph zone is approximately 400ft shorter than the recommended minimum length.

Township stakeholders have noted several rear end near-miss crashes that have been observed near 145th Dr, RP 330.365 (intersection #6). The access approach into residential housing is in the 65mph zone.

Speed Limit	Site #	85th % Speed (mph)		50th % Speed (mph)	
		NB	SB	NB	SB
45	3	61	56	56	49
65	4	72	69	66	64
65	5	72	71	67	66

The existing 45mph transition zone should be extended and a 55mph zone should be added past 145th Dr. By stepping down speed limits from a high speed zone to a community zone has shown to increase driver compliance.

45 to 65 MPH Zones South of Trenton

Speed data captured at spot locations near 147th Ave NW/44th Ln NW in the 45mph and 65mph zone are shown below.

The 85th and 50th percentile in the 45mph zone exceeds the expected ±5mph range of the posted speed. The 45mph speed zone length is over 2000ft which is extremely long for a transition zone and should be shortened. When a speed zone seems excessively long, drivers tend to not obey it for that extent when the environment is rural with no developments on either side of the road.

Adding a 55mph zone would extend past 147th Ave/44th Ln to step down speeds northbound and increase driver compliance. With the current traffic volumes expected to increase, and particularly truck volumes with differentiating speeds exiting and entering the highway, it is recommended to extend the 55mph from the Marley Crossing north to the 45mph transition zone.

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65 to 50 MPH Zones North of Marley Crossing

Speed data shown below was captured at a spot location in the 65mph zone before the Marley Crossing and at two locations in the 50mph speed zone through Marley crossing.

Speed Limit	Site #	85th % Speed (mph)		50th % Speed (mph)	
		NB	SB	NB	SB
65	6	74	73	69	68
50	7	63	63	57	57
50	8	63	63	56	57

The 85th percentile speeds exceed the expected ±5mph range of the posted 65mph speed limit and the 50th percentile is within the ±5mph range.

The 85th and the 50th percentile speeds in the 50mph speed zone exceed the expected ±5mph range of the posted 50mph speed limit indicating motorists are not complying with the speed limit. The speed zone was set in design to a safe speed for the curves and to slow motorists approaching the railroad tracks for a stop condition when trains are either crossing or stopped on the tracks. For that reason, the 50mph speed limit will remain. A 55mph zone will be added and continue north to the 45mph speed transition zone entering Trenton.

Proposed Speed Zone Recommendations:

North of Trenton

- Extend the 45mph speed limit transition zone north to approximate RP 330.700.
- Add a 55mph speed zone from the proposed 45mph zone north to approximate RP 330.15.

South of Trenton

- Shorten the 45mph transition speed zone to RP 331.952.
- Add a 55mph speed zone from the Marley Crossing at RP 335.360 north to the 45mph zone at RP 331.952

Refer to Figure 3 on page 6 for an aerial view of the existing and proposed speed zone modifications.

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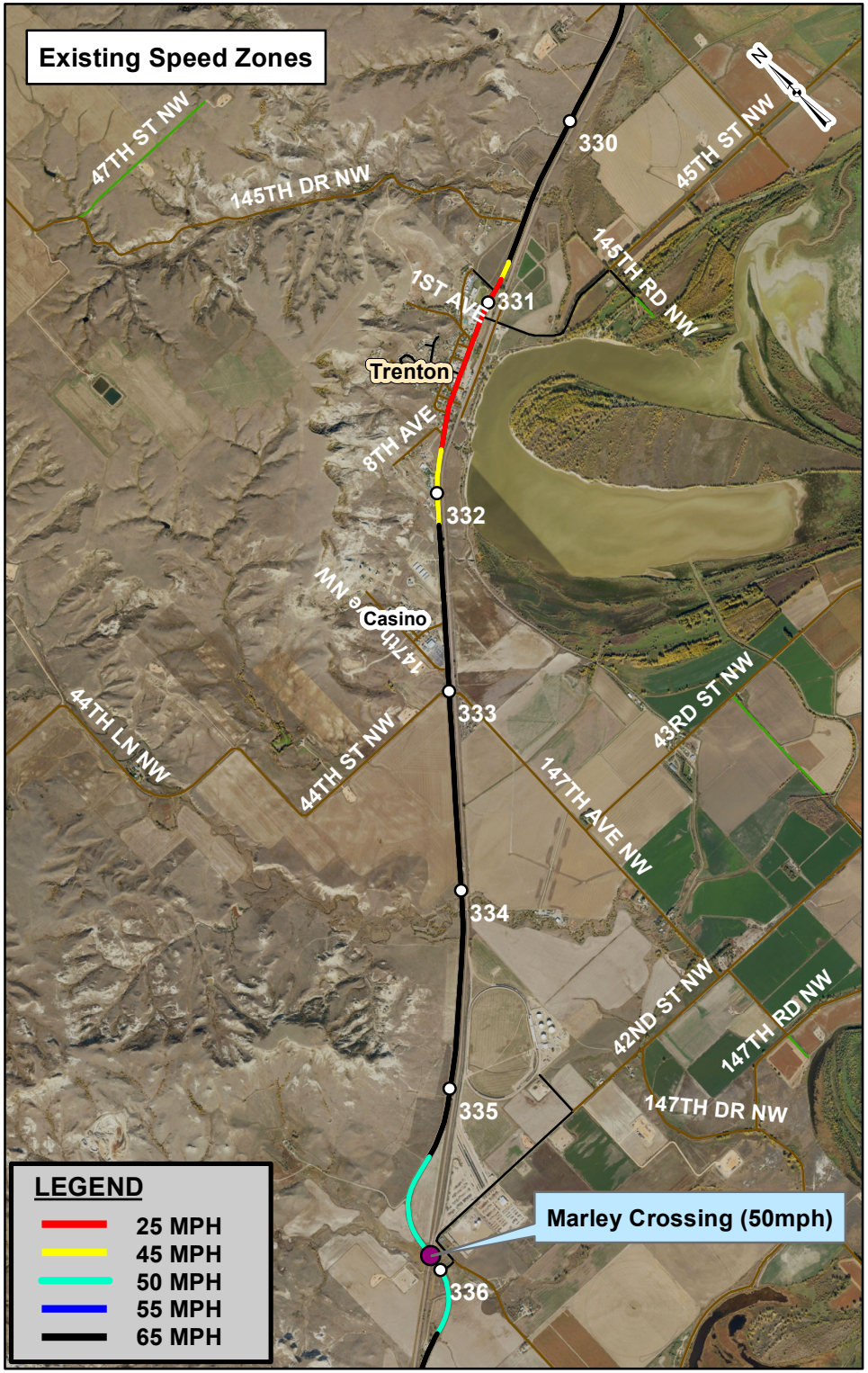

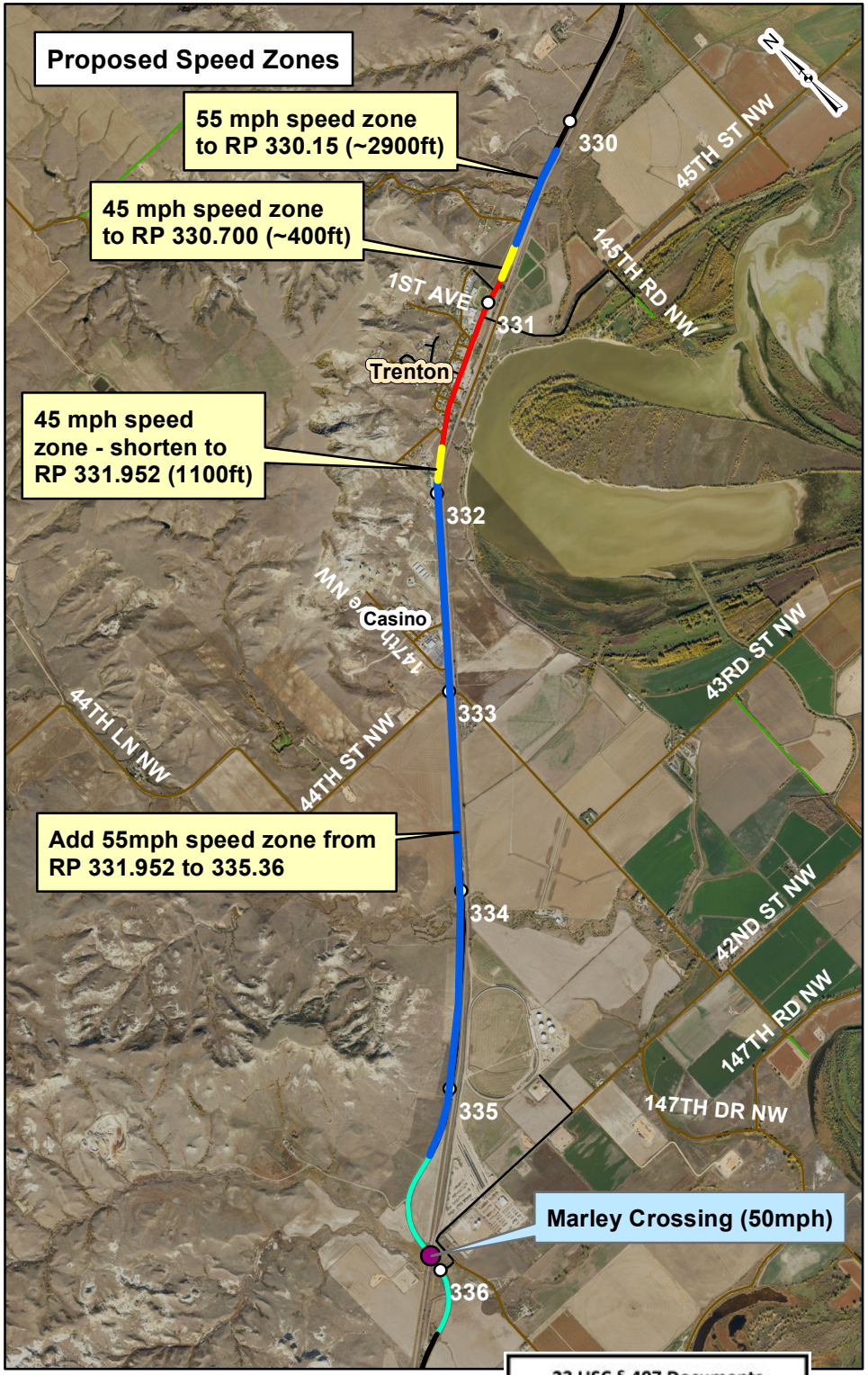

Figure 3 - Existing and Proposed Speed Zone Modifications

Intersection Analysis

Traffic data was collected by the NDDOT Traffic Data Section in July, 2024. ND 1804 is a major north/south free-flow roadway. Future traffic volumes were estimated at 1.3% for all vehicles and 1.8% for trucks. Future volumes are applied in the turn lane and capacity analysis and for destination lighting volume warrants for the following study intersections:

1. ND 1804 & Casino Approach, RP 332.75
2. ND 1804 & 147th Ave NW, RP 332.9
3. ND 1804 & 147th Ave NW/44th Ln (Co Rd 2), RP 331.04
4. ND 1804 & 42 St NW, RP 336.00
5. ND 1804 & 145th Rd NW, RP 331.08
6. ND 1804 & 145th Dr NW, RP 330.55
7. ND 1804 (RP 340.57) & 153rd Ave NW (Co Rd 5)
8. US 2 (RP & 153rd Ave NW (Co Rd 5)

Discussions at the RSR field meeting considered removing the existing Casino approach and utilizing 147th Ave to the north for the entrance. However, there is only 600ft between that approach and the next intersection at 44th Ln (Co Rd 2)/147th Ave. Higher traffic and truck volumes that are expected to increase at 44th Ln/147th Ave, warrant a southbound left turn lane. Consequently, a northbound left turn lane for 147th Ave will not fit without less than standard modifications.

<u>1-ND 1804 & Casino Entrance, T-Intersection (RP 332.75)</u>

- No crashes were reported at the intersection.
- The intersection was studied in 2021. Currently, there are no existing turn lanes in place. Warrants were met for a southbound right turn lane and a northbound left turn lane is expected to meet warrants in 2028, therefore, both were recommended.
- Sight distance for motorists leaving the casino approach looking left is a concern due to a slight vertical curve in the road. Other than re-grading the roadway, reducing the speed through the intersection with the installation of turn lanes was suggested.

Turn Lane Analysis

Year	Direction	Major Rd AADT	PCE	Threshold	Engineering Judgment	Met?
2044	NB Lt	6001	74	50	No	Yes
	SB Rt	6001	449	50	No	Yes

Turn lane volume warrants are met for northbound left and southbound right turn lanes.

Capacity Analysis

Capacity analysis of the intersection with the existing geometry and the revised geometry of a northbound left and a southbound right turn lane is shown in table 1. Delays for eastbound and northbound left turns slightly decrease with turn lanes.

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Table 1 - Casino Approach Capacity Analysis Results																	
Intersection of ND 1804	Geometry	EB				WB				NB				SB			
		L	LR	R	Appr	L	T	R	Appr	L	T	R	Appr	L	T	R	Appr
1- ND 1804 & Casino Approach	Existing	---	B 13.2	---	B 13.2	---				A 8.0	A 0.1	---	A 0.3	---	---	---	---
	NB Lt & SB Rt	---	B 12.9	---	B 12.9					A 7.9	---	---	A 0.2	---	---	---	---

Values shown are Level of Service, Delay (sec/veh)

Destination Lighting Warrants

6A – Recommended based on the HSIP or LRSP	No
6B – Traffic volume Cross product is 2,000,000 or more	Yes (5,862,977)
6C – Overhead span-wire flashing beacons removed	No
6D – Recommended based on engineering judgment	No
6E – Existing lighting system removed due to road project	No
6F – Local government agrees to 50% installation and maintain	No

The intersection meets the volume cross product warrant 6B.

Recommendations:

- Install a northbound left and a southbound right turn lane.

Proposed 55 MPH Turn Lane	L1	L2	L4	Total Length
NBL	180	335	100	615
SB Rt	180	335	-	515

- Install Destination Lighting.

<u>2-ND 1804 & 147th Ave N, T-Intersection (RP 332.9)</u>

- Two crashes were reported at this intersection; one incapacitating injury and one property damage only crash. The intersection was studied in 2021 and did not meet turn lane volume warrants, however it does meet the crash criteria warrant for a northbound left turn lane.

Turn Lane Analysis

Year	Direction	Major Rd AADT	PCE	Threshold	Engineering Judgment	Met?
2044	NB Lt	4043	44	50	Yes	Yes
	SB Rt	6001	25	50	No	No

Both reported crashes at the intersection were susceptible to correction with the installation of a northbound left lane. However, a standard northbound left turn lane is not feasible within the distance between this intersection and 44th LN/147th Ave that has the higher traffic and truck volumes and are expected to increase. Substandard turn lanes are not recommended at this location.

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Capacity Analysis

Capacity analysis of the intersection with the existing geometry and revised geometry of a northbound left lane is shown in table 2. Delay for the eastbound approach decreases from 10.5 to 9.1 sec/veh to LOS A with the installation of turn lanes.

Table 2 - 147th Ave NW Capacity Analysis Results

Intersection of ND 1804	Geometry	EB				WB				NB				SB			
		L	LR	R	Appr	L	T	R	Appr	L	T	R	Appr	L	T	R	Appr
2- ND 1804 & 147th Ave NW	Existing	---	B 10.5	---	B 10.5	---				A 7.7	A 0.0	---	A 0.2	---	---	---	---
	NB Lt	---	A 9.1	---	A 9.1	---				A 7.7	---	---	A 0.2	---	---	---	---

Values shown are Level of Service, Delay (sec/veh)

Destination Lighting Warrants

6A – Recommended based on the HSIP or LRSP	No
6B –Traffic volume Cross product is 2,000,000 or more	No (602,407)
6C – Overhead span-wire flashing beacons removed	No
6D – Recommended based on engineering judgment	No
6E – Existing lighting system removed due to road project	No
6F – Local government agrees to 50% installation and maintain	No

Lighting warrants are not met for the intersection.

Recommendations:

- It is not recommended to install a northbound left turn lane due to insufficient distance between intersections.

<u>3-ND 1804 & 44th Ln (Co Rd 2)/147th Ave NW (RP 331.04)</u>

- The three crashes reported at the intersection included one possible injury and two property damage only. One involved a northbound vehicle turning left and one involved a southbound vehicle turning left. The other was a single vehicle run-off-the-road crash.
- Railroad tracks parallel ND 1806 near 147th Ave. The crossing on 147th Ave is approximately 85ft from the approach onto ND 1804.
- Long trains can hold up traffic traveling southwest for 30 minutes or more.
- Longer and more trains are expected in addition to more truck traffic utilizing the intersection resulting in traffic on ND 1804 being blocked for southbound traffic. This is a serious concern for Fire and Rescue and emergency vehicles.

Construction Activities: Cerilon is projecting the new facility full build to be completed in 2035 will add approximately 880 vehicles per day transiting the crossing primarily to and from the northeast with approximately 34% trucks. The study did not estimate construction traffic or traffic conditions during construction activities that are anticipated to begin mid-2026 and Phase 1 being completed in 2028, but has indicated construction traffic will utilize the intersection of ND 1804 and 147th Ave NW to access the proposed site.

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Cerilon's Traffic Impact study shows the at-grade crossing currently experiences 28 trains daily, including the AMTRAK Empire Builder with a maximum speed of 79mph and freight trains can travel at 65mph. The area has experienced an AADT growth of 8.8% since 2020. Development expected in the area will increase rail and truck traffic along the corridor.

Cerilon is developing a Construction Management Plan (CMP), separate from the Traffic Impact Study, that will discuss construction phase traffic management. It is assumed temporary speed limits will be put in place during construction activities. Traffic patterns can be monitored and speed limits adjusted, if needed, at that time.

Turn Lane Analysis

Year	Direction	Major Rd AADT	PCE	Threshold	Engineering Judgment	Met?
2044	NB Lt	5339	53	50	No	Yes
	NB Rt	5339	10	50	No	No
	SB Lt	5339	136	50	No	Yes
	SB Rt	5339	52	50	No	Yes

The volume criteria is met for northbound left, southbound left and southbound right turn lanes. Additionally, left turn crashes northbound and southbound were susceptible to correction with a left turn lane.

Capacity Analysis

Capacity analysis of the existing and revised geometry is shown in table 3. Delays on the eastbound and southbound approaches slightly decrease with the installation of turn lanes.

Table 3 - 44th Ln (CR 2)/ 147th Ave Capacity Analysis Results

Intersection of ND 1804	Geometry	EB				WB				NB				SB			
		L	LTR	R	Appr	L	LTR	TR	Appr	L	T	R	Appr	L	T	R	Appr
3- ND 1804 & 44th Ln/147th Ave NW	Existing	---	B	---	B	---	B	---	B	A	A	A	A	A	A	A	A
			13.3		13.3		10.7		10.7	8.9	0.0	0.0	0.1	7.9	0.1	0.1	0.4
	NB Lt & SB Lt &Rt	---	B	---	B	---	B	---	B	A	---	---	A	A	---	---	A
			13.2		13.2		10.7		10.7	8.9			0.1	7.9			0.3

Values shown are Level of Service, Delay (sec/veh)

Destination Lighting

6A – Recommended based on the HSIP or LRSP	No
6B – Traffic volume Cross product is 2,000,000 or more	No (1,222,639)
6C – Overhead span-wire flashing beacons removed	No
6D – Recommended based on engineering judgment	Yes
6E – Existing lighting system removed due to road project	No
6F – Local government agrees to 50% installation and maintain	No

The existing traffic volumes do not meet the volume warrants. However, under warrant 6D, engineering judgment, destination lighting is recommended based on the changing traffic patterns and the geometry at the intersection.

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Recommendations:

- Install Destination Lighting
- Install northbound left, southbound left, and southbound right turn lanes.

Proposed 55 MPH Turn Lane	L1	L2	L4	Total Length
NBL	180	335	100	615
SBL	180	335	100	615
SBR	180	335	-	515

4-ND 1804 & 42nd St NW, T-Intersection (RP 336.00)

- No crashes have been reported at the intersection in the past 5-yr period.
- Existing speed limit is 50mph.
- Existing southbound left and northbound right turn lanes in place.
- The railroad tracks are approximately 450ft north of the intersection.
- The connecting road between 42nd St/149th Ave and ND 1804 is approximately 400ft.
- Truck traffic will increase on 42nd St during construction and operation of the gas plant. Traffic on the connecting road from 42nd St and 149th Ave waiting to turn onto ND 1804 can get stacked up while a train is crossing or stopped on the tracks.

Turn Lane Analysis

The existing turn lanes meet volume criteria.

Year	Direction	Major Rd AADT	PCE	Threshold	Engineering Judgment	Met?
2044	NB Rt	5209	435	50	No	Yes
	SB Lt	5209	196	50	No	Yes

Capacity Analysis

The capacity analysis results in table 4 indicates the intersection will operate sufficiently with the existing geometry and projected future volumes when no trains are crossing or on the tracks.

Table 4 - 42nd St/149th Ave Capacity Analysis Results

Intersection of ND 1804	Geometry	EB				WB				NB				SB			
		L	LR	R	Appr	L	LR	R	Appr	L	T	R	Appr	L	T	R	Appr
4- ND 1804 & 42nd St/149th	Existing	---				---	B 12.9	---	B 12.9	---	---	---	---	A 8.1	---	---	A 0.5

Values shown are Level of Service, Delay (sec/veh)

Destination Lighting

6A – Recommended based on the HSIP or LRSP	No
6B – Traffic volume Cross product is 2,000,000 or more	Yes (4,031,766)
6C – Overhead span-wire flashing beacons removed	No
6D – Recommended based on engineering judgment	No
6E – Existing lighting system removed due to road project	No
6F – Local government agrees to 50% installation and maintain	No

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The intersection meets the volume cross product warrant 6B. There is no existing lighting at the intersection however, a single wood light pole is in place on the northeast corner of the railroad crossing for the maintenance road approximately 550ft north. To help drivers navigate the horizontal and the environment changes of the roadway through the Marley Crossing area, Illumination Lighting is recommended through the area (Illumination Lighting Warrant 5F, engineering judgment).

Recommendations:

- Install Illumination Lighting.

5- ND 1804 & 145th Rd (RP 331.08)

This intersection was added to the review because of the access approach to the school on the west and a public use road to a camping and RV park at Lake Trenton on the east.

- No crashes have been reported at the intersection.

Turn Lane Analysis

The intersection is in the 25mph speed zone. There is an existing northbound left turn in place to the school.

Volume warrants are not met for northbound or southbound turn lanes with future volumes; however, it should be noted that data was collected when school was not in session.

Year	Direction	Major Rd AADT	PCE	Threshold	Engineering Judgment	Met?
2044	NB Lt	6519	32	91.3	No	No - Existing
	NB Rt	6519	107	-	No	No
	SB Lt	6519	87	91.3	No	No
	SB Rt	6519	43	-	No	No

Capacity Analysis

The capacity analysis in table 5 indicates the intersection will operate sufficiently with the existing geometry and projected future volumes.

Table 5 - 145th Rd Capacity Analysis Results

Intersection of ND 1804	Geometry	EB				WB				NB				SB			
		L	LRT	R	Appr	L	LRT	R	Appr	L	T	R	Appr	L	T	R	Appr
5- ND 1804 & 145th Rd (south)	Existing	---	B 13.4	---	B 13.4	---	B 14.0	---	B 14.0	A 8.8	---	---	A 0.1	A 8.1	A 0.1	A 0.1	A 0.6

Values shown are Level of Service, Delay (sec/veh)

Lighting

The intersection meets warrant 6B for Destination Lighting where the cross product of the major and minor road is ≥2,000,000 (2,333,802). Currently, there is existing spot lighting on power poles at intersections through the segment that are not standard streetlights.

Sidewalk and curb & gutter is in place from the school on the north end to 8th Ave on the south end of the community on the west side only. There are no developments on the east due to

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the rail line. Because of the volume of traffic traveling though the community, particularly heavy trucks that will increase as more development takes place, full street lighting should be considered.

Lighting is part of the Safe System approach for Safe Roads and provides safety and security for all road users in underserved communities. It helps motorists to detect a change in the environment that signifies a need to reduce speeds entering diverse surroundings.

Recommendations:

- Install full street lighting on the west side of the roadway from the school north of 1st Ave to 8th Ave.

6-ND 1804 & 145th Rd (RP 330.55), T-Intersection

- No crashes reported in the 5yr time period.
- Local through and connecting gravel road to the north.
- Access approach to several residences.
- Observations of near rear-end misses in existing 65 mph speed zone.
- 55mph speed zone is proposed.

Turn Lane Analysis

Year	Direction	Major Rd AADT	PCE	Threshold	Engineering Judgment	Met?
2044	NB Lt	6613	55	50	No	Yes
	SB Rt	6613	36	50	No	No

Volume warrant 6B is met for a northbound left turn lane.

Capacity Analysis

The capacity analysis in table 6 shows a slight increase in delays for the northbound approach.

Table 6 - 145th Dr Capacity Analysis Results

Intersection of ND 1804	Geometry	EB				WB				NB				SB			
		L	LR	R	Appr	L	T	R	Appr	L	T	R	Appr	L	T	R	Appr
6- ND 1804 & 145th Dr NW (north)	Existing	---	B	---	B	---				A	A	---	A	---	---	---	---
			12.1		12.1					8.0	0.1		0.2				
	NB Lt	---	B	---	B	---				A	---	---	A	---	---	---	---
			12.1		12.1					8.0			0.1				

Values shown are Level of Service, Delay (sec/veh)

Destination Lighting

6A – Recommended based on the HSIP or LRSP	No
6B – Traffic volume Cross product is 2,000,000 or more	No (1,177,114)
6C – Overhead span-wire flashing beacons removed	No
6D – Recommended based on engineering judgment	No
6E – Existing lighting system removed due to road project	No
6F – Local government agrees to 50% installation and maintain	No

Warrants are not met for Destination Lighting.

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Recommendations:

- Install a northbound left turn lane.

Proposed 55 MPH Turn Lane	L1	L2	L4	Total Length
NBL	180	335	100	615

Williams County Road 5 (153rd Ave NW)

Williams County Road 5 (Co Rd 5) is being considered for a bypass road during construction from the junction of ND 1804 at RP 340.57 north to US 2. The segment is shown on page i of this report.

Existing Conditions

Co Rd 5 is a paved, two-lane local road that runs north from the junction of ND 1804 to the junction with US 2.

Classification: Major Collector
2024 AADT at ND 1804: 1191 TAADT: 562 (47%)
2024 AADT at US 2: 1149 TAADT: 862 (75%)
Speed Limit: 55mph
Typical Section: (2) 12ft driving lanes, no shoulders

Crash History

Five crashes were reported in the past 5yr period from 7-1-19 to 6-30-24. One fatal and one incapacitating injury was reported. Two crashes reported non-incapacitating injuries and one was a property damage only. The fatal was a run-off-the-road crash where the driver overcorrected, entered the ditch and rolled. The incapacitating injury occurred when a motorcycle attempted to pass a vehicle on a downhill vertical grade and failed to negotiate a horizontal curve at the bottom of it. The detailed crash summary is in attachment 1.

Intersection Analysis

7- Co Rd 5 (153rd Ave) & ND 1804 (RP 340.57), T-Intersection

- One single vehicle crash with a non-incapacitating injury was reported that was not susceptible to correction with a turn lane.
- No existing turn lanes in place.
- Railroad overpass is approximately 260ft north of the intersection.
- Destination Lighting in the southeast quadrant of the intersection.

Turn Lane Analysis

Year	Direction	Major Rd AADT	PCE	Threshold	Engineering Judgment	Met?
2044	EB Lt	5786	684	50	No	Yes
	WB Rt	5786	195	50	No	Yes

Volume warrants are met for an eastbound left and a westbound right turn lane.

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Capacity Analysis

The capacity analysis in table 7 shows the overall eastbound approach delays and the southbound approach delays slightly decrease.

Table 7 - County Road 5 Capacity Analysis

Intersection of ND 1804	Geometry	EB				WB				NB				SB			
		L	T	R	Appr	L	LTR	TR	Appr	L	T	R	Appr	L	LR	R	Appr
7 - Co Rd 5 & ND 1804	Existing	A	---	A	A	---				---				---	B	---	B
		8.7		0.5	1.8										12.5		12.5
	EB Lt & WB Rt	A	---	---	A	---				---				---	B	---	B
		8.7			1.4										12.4		12.4

Values shown are Level of Service, Delay (sec/veh)

Recommendations:

- Install an eastbound left and a westbound right turn lane.

65 MPH Turn Lane	L1	L2	L4	Total Length
EBL	180	530	100	810
WBR	180	530	-	710

<u>8- US 2 (RP 2.486) & Co Rd 5</u>

- No crashes were reported in the past 5yr period.
- Existing eastbound left and right turn lanes in place.
- Westbound left turn lane in place.
- Destination Lighting in the southwest quadrant of the intersection.

Turn Lane Analysis

Because eastbound left and right turn lanes and a westbound left turn lane are in place, turn lanes were analyzed only for a westbound right turn lane.

Year	Direction	Major Rd AADT	PCE	Threshold	Engineering Judgment	Met?
2044	WB Lt	2957	63	76.08	No	No

Volume warrants are not met for a westbound right turn lane.

Capacity Analysis

The capacity analysis with the existing geometry shows the intersection will operate adequately with future traffic.

Table 8 - US 2 & Co Rd 5

Intersection of US 2	Geometry	EB				WB				NB				SB			
		L	T	R	Appr	L	LTR	TR	Appr	L	LTR	R	Appr	L	LRT	R	Appr
8 - Co Rd 5	Existing	A	---	---	A	A	---	---	A	---	B		B	---	B	---	B
		7.9			0.3	8.1			1.8		10.5		10.5		11.3		11.3

Values shown are Level of Service, Delay (sec/veh)

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Signing
If Co Rd 5 becomes a bypass for construction activities, advance guide signs will need to be installed on US 2 and on ND 1804 that clearly directs traffic to the bypass.

Recommendations:

- Consider installing guide signs if Co Rd 5 becomes a designated bypass route.

SUMMARY OF RECOMMENDATIONS

ND 1804

Page 5

North of Trenton:

- Extend the 45mph speed limit transition zone north to approximate RP 330.7000.
- Add a 55mph speed zone from the 45mph zone north to approximate RP 330.15.

South of Trenton:

- Shorten the 45mph speed zone transition to RP 331.952.
- Add a 55mph speed zone from the Marley Crossing, RP 335.36, north to the 45mph zone at RP 331.952.

Page 8: Intersection 1 - Casino Approach, RP 332.75

- Install a northbound left and a southbound right turn lane.
- Install Destination Lighting.

Page 11: Intersection 3 – 44th Ln/147th Ave NW, RP 331.04

- Install northbound left, southbound left, and southbound right turn lanes.
- Install Destination Lighting

Page 12: Intersection 4 – 42nd St NW, RP 336.00

- Install Illumination Lighting.

Page 13: Intersection 5 – 145th Rd, RP 331.08

- Install full street lighting from the school north of 1st Ave to 8th Ave.

Page 14: Intersection 6 – 145th Dr, RP 330.55

- Install a northbound left turn lane.

Williams County Road 5

Page 15: Intersection 7 – ND 1804, RP 340.57

- Install an eastbound left and a westbound right turn lane.

Page 16: Intersection 8 – US 2

- Consider installing guide signs if Co Rd 5 becomes a bypass during construction activities.

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ATTACHMENT 1 - CRASH DATA

Rural Segment Crash Summary Sheets

Total Crashes: 29 (Sorted by Longitude)
Location: ND 1804
Reference Points: 329.27-340.3
Start - End Date: 7/1/2019 - 6/30/2024 (5 Years)

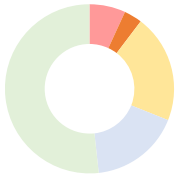
Notes: Non-injury animal crashes were not included.

23 USC § 407 Documents NDDOT Reserves All Objections

VISION ZERO

Statistics for Total Crashes

Crash Severity	Letter Code	No. of Crashes
Fatal	K	2
Incapacitating Injury	A	1
Non-incapacitating Injury	B	6
Possible Injury	C	5
Property Damage Only	O	15
		29



EPDO Score = 427

Manner of Collision			Breakdown by Severity K	A	B	C	O
Angle	1	3%	0	0	0	1	0
Rear End	13	45%	0	0	4	2	7
Left Turn	1	3%	0	0	0	1	0
Sideswipe (same dir.)	2	7%	0	1	0	0	1
Sideswipe (opp dir.)	0	0%	0	0	0	0	0
Single Vehicle	11	38%	1	0	2	1	7
Ped/Bike	0	0%	0	0	0	0	0
Head On	1	3%	1	0	0	0	0
Backing	0	0%	0	0	0	0	0
Other	0	0%	0	0	0	0	0
	29	100%	2	1	6	5	15

Surface Conditions			Breakdown by Severity K	A	B	C	O
Dry	22	76%	2	0	4	4	12
Wet	0	0%	0	0	0	0	0
Ice / Snow	7	24%	0	1	2	1	3
Other	0	0%	0	0	0	0	0
	29	100%	2	1	6	5	15

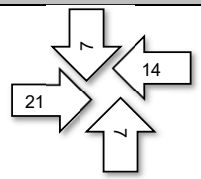
Lighting Conditions			Breakdown by Severity K	A	B	C	O
Dawn/Dusk	0	0%	0	0	0	0	0
Daylight	21	72%	2	1	5	4	9
Dark	7	24%	0	0	1	1	5
Dark (lighted)	1	3%	0	0	0	0	1
Unknown	0	0%	0	0	0	0	0
	29	100%	2	1	6	5	15

Roadway Geometrics		
Straight (on level) =	20	69%
Straight (on grade) =	1	3%
Curve (on level) =	7	24%
Curve (on grade) =	0	0%
Hill Crest =	0	0%
Unknown =	1	3%
	29	

V1 and V2 Configuration*	
Passenger Car =	9
PU / Van / Utility =	30
Truck =	6
Bus / Motorhome =	0
Motorcycle + Moped =	1
Ped or Bike =	0

These are only the most popular choices.

V1 and V2 Directions



NB = 7
SB = 7
EB = 21
WB = 14

D1 and D2 Alcohol / Drugs*

Yes (alcohol or drugs present) = 1

Month

Military Time	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	
	1	2	3	4	5	6	7	8	9	10	11	12	
0													0
1													0
2													0
3		■											1
4	■												1
5											■		1
6													0
7													0
8					■			■					2
9											■		1
10			■										1
11	■									■			2
12			■			■							2
13													0
14											■	■	2
15				■				■				■	3
16						■		■				■	3
17							■			■		■	4
18			■						■				2
19	■	■									■		3
20													0
21								■					1
22													0
23													0
Total	3	2	3	1	1	2	2	4	1	2	4	4	29

Under Construction

Yes = 0 0%

D1 and D2 Contr. Factors*

Attention Distracted =	0	
Weather =	2	
Speed =	2	
Too Fast for Conditions =	4	
Fail to Yield =	2	
Improper Backing/Turning =	0	

These are only the most popular choices.

D1 or D2 Ejected*

Yes (partially or fully) = 0

This info is not available for all units.

First Harmful Event		
Motor Vehicle in Transport =	18	62%
Animal =	0	0%
Jackknife =	0	0%
Ran Off Roadway (not including below crashes) =	5	17%
Guardrail + Concrete Barrier + Bridge Rail =	0	0%
Bridge / Pier / Abutment / Overhead Structure =	0	0%
Poles / Posts / Trees / Overhead Sign Supports =	1	3%

These are only the most popular choices.

Day of Week		
Monday =	7	24%
Tuesday =	3	10%
Wednesday =	5	17%
Thursday =	4	14%
Friday =	5	17%
Saturday =	3	10%
Sunday =	2	7%
	29	

Relation to Junction		
Non-Junction =	19	66%
Intersection + Intersection-Related =	6	21%
Alley / Driveway Access =	2	7%
Interchange Area + Exit / Entrance Ramp =	0	0%

These are only the most popular choices.

D1 and D2 Age/Sex

Age	M	F	Total
0-17	0	1	1
18-20	3	1	4
21-24	2	0	2
25-34	6	5	11
35-44	6	2	8
45-54	4	1	5
55-64	8	2	10
65-74	4	0	4
75+	2	0	2
	35	12	47

Yr	Start Date	End Date	Intersection? YES (or Alley / Drvwy)	NO Single Veh	NO Mult. Veh	Total	Severity K	A	B	C	O	Surface Conditions Dry	Wet	Ice/Snow	Work Zone
1	7/1/19	6/30/20		3	3	6					6	5		1	
2	7/1/20	6/30/21	1	2		3					3	2		1	
3	7/1/21	6/30/22	2	1	3	6			3	1	2	5		1	
4	7/1/22	6/30/23	2	3	3	8	2		1	2	3	6		2	
5	7/1/23	6/30/24	3	1	2	6		1	2	2	1	4		2	
			8 (27.6%)	10 (34.5%)	11 (37.9%)	**29**	2	1	6	5	15	22		7	

Vision Zero Emphasis Areas

8 Lane Departure Crashes
8 Intersection Crashes
1 Alcohol and/or Drug Related Crashes
5 Unbelted Vehicle Occupant Crashes
6 Speed Related Crashes
5 Young Driver Crashes

Rural Segment Crash Summary Sheets

Total Crashes: 29 (Sorted by Longitude)
Location: ND 1804
Reference Points: 329.27-340.3
Start - End Date: 7/1/2019 - 6/30/2024 (5 Years)

Notes: Non-injury animal crashes were not included.

23 USC § 407 Documents NDDOT Reserves All Objections

VISION ZERO

Statistics for Intersection-Related Crashes ONLY

Crash Severity

K =	0	0%
A =	1	13%
B =	1	13%
C =	3	38%
O =	3	38%
	8	

Surface Conditions

Dry =	5	63%
Wet =	0	0%
Ice / Snow =	3	38%
Other =	0	0%

Lighting Conditions

Dawn =	0	0%
Daylight =	5	63%
Dusk =	0	0%
Dark =	3	38%
Dark (lighted) =	0	0%

Under Construction

Yes =	0	0%

Relation to Junction

Intersection + Intersection-Related =	6	75%
Alley / Driveway Access =	2	25%

Manner of Collision

Angle =	1	13%
Rear End =	4	50%
Left Turn =	1	13%
Sideswipe (same direction) =	1	13%
Single Vehicle =	1	13%
Ped / Bike =	0	0%
Other =	0	0%

D1 and D2 Contributing Factors*

Attention Distracted =	0
Weather =	1
Speed =	0
Too Fast for Conditions =	1
Fail to Yield =	2
Improper Backing / Turning =	0

These are only the most popular choices.

D1 and D2 Alcohol / Drugs Present*

Yes (alcohol or drugs) =	0

V1 and V2 Unit Config.*

Passenger Car =	2
PU / Van / Utility =	10
Truck =	2
Bus / Motorhome =	0
Motorcycle + Moped =	0

These are only the most popular choices.

V1 and V2 Traffic Control

	V1	V2
Signal =	1	1
Stop =	0	0
Beacon =	0	0

These are only the most popular choices.

**This info is not available for all units.*

Statistics for Non-Intersection Crashes ONLY

Multiple Vehicle Crashes ONLY

Crash Severity

K =	1	9%
A =	0	0%
B =	3	27%
C =	1	9%
O =	6	55%
	11	

Surface Conditions

Dry =	10	91%
Wet =	0	0%
Ice / Snow =	1	9%
Other =	0	0%

Lighting Conditions

Dawn =	0	0%
Daylight =	10	91%
Dusk =	0	0%
Dark =	1	9%
Dark (lighted) =	0	0%

Road Geometrics

Straight (on level) =	8	73%
Straight (on grade) =	1	9%
Curve (on level) =	2	18%
Curve (on grade) =	0	0%
Hill Crest =	0	0%

Under Construction

Yes =	0	0%

D1 or D2 Ejected*

Yes =	0

Manner of Collision

Angle =	0	0%
Rear End =	9	82%
Left Turn =	0	0%
Sideswipe (same direction) =	1	9%
Head-On + Sideswipe (opp direction) =	1	9%
Other =	0	0%

D1 and D2 Alcohol/Drugs Present*

Yes (alcohol or drugs) =	1

V1 and V2 Unit Config.*

Passenger Car =	0	
PU / Van / Utility =	0	
Truck =	0	
Bus / Motorhome =	0	
Motorcycle + Moped =	0	

These are only the most popular choices.

Non-Collision with Motor Vehicle (a.k.a. Single Vehicle) Crashes ONLY

Crash Severity

K =	1	10%
A =	0	0%
B =	2	20%
C =	1	10%
O =	6	60%
	10	

Surface Conditions

Dry =	7	70%
Wet =	0	0%
Ice / Snow =	3	30%
Other =	0	0%

Lighting Conditions

Dawn =	0	0%
Daylight =	6	60%
Dusk =	0	0%
Dark =	3	30%
Dark (lighted) =	1	10%

Road Geometrics

Straight (on level) =	4	40%
Straight (on grade) =	0	0%
Curve (on level) =	5	50%
Curve (on grade) =	0	0%
Hill Crest =	0	0%

Under Construction

Yes =	0	0%

D1 Ejected*

Yes (partially or fully) =	0	0%

D1 Most Harmful Event*

Motor Vehicle in Transport =	0	0%
Animal =	0	0%
Jackknife =	0	0%
Ran Off Roadway (not including below crashes) =	4	40%
Guardrail + Concrete Barrier + Bridge Rail =	0	0%
Bridge / Pier / Abutment / Overhead Structure =	0	0%
Poles / Posts / Trees / Overhead Sign Supports =	1	10%

These are only the most popular choices.

D1 Alcohol / Drugs Present*

Yes (alcohol or drugs) =	0	0%

V1 Unit Config.*

Passenger Car =	3	30%
PU / Van / Utility =	7	70%
Truck =	0	0%
Bus / Motorhome =	0	0%
Motorcycle + Moped =	1	10%

These are only the most popular choices.

**This info is not available for all units.*

Rural Segment Crash Summary Sheets

Total Crashes: 29 (Sorted by Longitude)
City: near Trenton
Location: ND 1804
Start - End Date: 7/1/2019 - 6/30/2024 (5 Years)

23 USC § 407 Documents
NDDOT Reserves All Objections

LEGEND
- ▶ *Fatal*
- ▶ *Incapacitating Injury*
- ▶ *Non-Incapacitating Injury*
- ▷ *Possible Injury*
- ♦ *Wet surface*
- ❄ *Snow, Ice, Slush, Frost*
- ▲ *Crash related to work zone*
- ① *Unit number*

1. Contributing Factor
** = alcohol or drugs involved*

2. Most Harmful Event
For single vehicle crashes, the most harmful event is shown in parentheses in the "Type of Collision" column

VISION ZERO

	Crash No.	Crash Severity Date, Day Surface Conditions, Weather Lighting, Time Road Geometrics, Relation to Jct	Type of Collision	① AGE SEX CITY STATE Unit Configuration Movement (traffic control) Contributing Factor[1] Most Harmful Event[2]	Shortened Narrative	Name of Intersection	Diagram
1	1137197 1804 329.06	PDO 03/25/23 Saturday Dry Clear Daylight 12:43 PM Straight (on Grade) Non-junction	Rear End	① 31M WILLISTON ND Pickup - Van - Utility SB Going Straight No Insurance ② 43M WILLISTON ND Pickup - Van - Utility SB Slowing/Stopping			↓ ↓
2	1130983 ▷ 1804 329.27	Possible Injury 12/05/22 Monday Dry Cloudy Daylight 2:28 PM Straight (on Level) Intersection	Angle	① 56F TRENTON ND Passenger Car SB Going Straight Failed to Yield ② 62M WILLISTON ND Pickup - Van - Utility EB Going Straight		ND 1804 & 46th St NW	↓ →
3	1119668 ▷ 1804 329.43	Possible Injury 02/10/22 Thursday Ice / Snow Rain ❄ Dark 3:17 AM Curve (on Level) Non-junction	Single Veh. (Ditch)	① 20M MINOT ND Passenger Car NB Turning Left To Fast for Conditions Ditch			X ↑
4	1104383 1804 329.89	PDO 02/12/21 Friday Dry Clear Dark(L) 7:30 PM Straight (on Level) Non-junction	Single Veh. (Other Object (Not Fixed))	① 19M SPEARFISH SD Pickup - Van - Utility EB Going Straight Other Other Object (Not Fixed) ② 23M TACOMA WA Passenger Car EB Going Straight Other Object (Not Fixed)	V1 was EB towing a water tank that came off the trailer into the WB lanes and was struck by V2.		→X
5	1138771 1804 330.07	PDO 05/08/23 Monday Dry Cloudy Daylight 8:08 AM Straight (on Level) Non-junction	Single Veh. (Cargo Loss or Shift)	① 58M WILLISTON ND Pickup - Van - Utility EB Going Straight Other Cargo Loss or Shift ② 50M WILLISTON ND Pickup - Van - Utility WB Going Straight Cargo Loss or Shift	V1 was hauling furniture that flew off the back of the pk-up and struck V2 that was traveling behind V1.		→X
6	1083005 1804 330.07	PDO 08/29/19 Thursday Dry Clear Dark 9:10 PM Straight (on Level) Non-junction	Single Veh. (Overturn / Rollover)	① 18M SIDNEY MT Passenger Car EB Going Straight Defective Equipment Overturn / Rollover			→X
7	1095480 1804 330.33	PDO 06/18/20 Thursday Dry Cloudy Daylight 12:10 PM Straight (on Level) Non-junction	Single Veh. (Fire / Explosion)	① 54M WILLISTON ND Pickup - Van - Utility EB Going Straight Fire / Explosion			→X
8	1115507 ▶ 1804 330.46	Non-incapacitating injury 12/01/21 Wednesday Dry Clear Dark 5:54 PM Straight (on Level) Alley/Driveway	Rear End	① 17F WILLISTON ND Pickup - Van - Utility NB Going Straight Other ② 50M WILLISTON ND Pickup - Van - Utility NB Turning Left ③ 26M TRENTON ND Pickup - Van - Utility SB Going Straight Cargo Loss or Shift		ND 1804 & Private Dr	↑ ↑
9	1141009 ▷ 1804 330.49	Possible Injury 07/09/23 Sunday Dry Clear Daylight 5:55 PM Straight (on Level) Intersection	Rear End	① 69M TRENTON ND Pickup - Van - Utility EB Going Straight (Signal) ② 65M RESERVE MT Pickup - Van - Utility EB Stopped (Signal)		ND 1804 & Private Dr	→→
10	1094952 1804 330.76	PDO 06/01/20 Monday Dry Clear Daylight 4:46 PM Curve (on Level) Non-junction	Rear End	① 29F TRENTON ND Passenger Car EB Going Straight Careless/Reckless Driving ② 42F WILLISTON ND Pickup - Van - Utility EB Going Straight			→→

Rural Segment Crash Summary Sheets

Total Crashes: 29 (Sorted by Longitude)
City: near Trenton
Location: ND 1804
Start - End Date: 7/1/2019 - 6/30/2024 (5 Years)

23 USC § 407 Documents
NDDOT Reserves All Objections

LEGEND
- ▶ *Fatal*
- ▶ *Incapacitating Injury*
- ▶ *Non-Incapacitating Injury*
- ▷ *Possible Injury*
- ♦ *Wet surface*
- ❄ *Snow, Ice, Slush, Frost*
- ▲ *Crash related to work zone*
- ① *Unit number*

1. Contributing Factor
** = alcohol or drugs involved*

2. Most Harmful Event
For single vehicle crashes, the most harmful event is shown in parentheses in the "Type of Collision" column

VISION ZERO

	Crash No.	Crash Severity Date, Day Surface Conditions, Weather Lighting, Time Road Geometrics, Relation to Jct	Type of Collision	① AGE SEX CITY STATE Unit Configuration Movement (traffic control) Contributing Factor[1] Most Harmful Event[2]		Shortened Narrative	Name of Intersection	Diagram
11	1128695 ▷ 1804 331.54	Possible Injury 10/11/22 Tuesday Dry Clear Daylight 11:48 AM Straight (on Level) Non-Junction	Rear End	① 56M CULBERTSON MT Unknown Heavy Truck EB Going Straight To Fast for Conditions	② 32M SAN DIEGO CA Truck Tractor EB Going Straight			→→
12	1116233 ▶ 1804 331.94	Non-incapacitating injury 12/14/21 Tuesday Dry Clear Daylight 3:30 PM Straight (on Level) Non-junction	Rear End	① 18F COLSTRIP MT Pickup - Van - Utility WB Going Straight Other	② 77M FAIRVIEW MT Passenger Car WB Turning Right			←←
13	1126736 ▶ 1804 332.08	Fatal 08/27/22 Saturday Dry Clear Daylight 4:19 PM Straight (on Level) Non-junction	Head on	① 29F MERIDIAN ID Pickup - Van - Utility EB Going Straight Fail Keep in Proper Lane Other Non-Collision	② 67M BURLINGTON WY Pickup - Van - Utility WB Going Straight	V1 crossed the centerline into the WB lanes and struck V2 head on.		→←
14	1086915 1804 332.64	PDO 11/18/19 Monday Dry Clear Dark 7:33 PM Straight (on Level) Non-junction	Rear End	① 28M WILLISTON ND Passenger Car EB Going Straight Speed *	② 66M TRENTON ND Passenger Car EB Going Straight			→→
15	1136009 1804 332.89	PDO 03/07/23 Tuesday Ice / Snow Cloudy ❄ Daylight 6:12 PM Straight (on Level) Alley/Driveway	Rear End	① 38M WILLISTON ND Pickup - Van - Utility NB Going Straight Following too Close	② 28M WILLISTON ND Passenger Car NB Turning Left		ND 1804 & 147th Ave NW	↑ ↑
16	1144065 ▷ 1804 332.89	Possible Injury 09/29/23 Friday Dry Clear Daylight 6:53 PM Straight (on Level) Intersection	Left Turn	① 59F WILLISTON ND Pickup - Van - Utility EB Turning Left Careless/Reckless Driving	② 36M WILLISTON ND Pickup - Van - Utility WB Going Straight		ND 1804 & 147th Ave NW/44th Ln NW (Co Rd 2)	→←
17	1149269 ▶ 1804 332.89	Incapacitating Injury 01/22/24 Monday Snow Cloudy ❄ Daylight 11:55 AM Straight (on Level) Intersection	Sideswipe (Same Dir.)	① 58M BENTON AR Truck Tractor EB Passing Weather	② 81M TRENTON ND Construction Equipment EB Turning Left	V2 was a maintenance vehicle that slowed to turn left. D1 attempted to pass as it began to turn and struck V2.	ND 1804 & 147th Ave NW	→ →
18	1119100 1804 333.01	PDO 01/28/22 Friday Dry Clear Dark 7:04 PM Straight (on Level) Intersection	Rear End	① 34F WAUKESHA WI Pickup - Van - Utility WB Passing Failed to Yield	② 57M KELL IL Truck Tractor WB Turning Left		ND 1804 & 147th Ave NW/44th Ln NW (Co Rd 2)	←←
19	1100841 1804 333.01	PDO 11/11/20 Wednesday Ice / Snow Clear ❄ Dark 5:30 AM Straight (on Level) Intersection	Single Veh. (Ditch)	① 40M ALBUQUERQUE NM Pickup - Van - Utility WB Going Straight To Fast for Conditions Ditch			ND 1804 & 147th Ave NW/44th Ln NW (Co Rd 2)	X←
20	1142895 ▶ 1804 334.7	Non-incapacitating injury 08/30/23 Wednesday Dry Clear Daylight 8:40 AM Curve (on Level) Non-junction	Single Veh. (Overturn / Rollover)	① 27M WILLISTON ND Pickup - Van - Utility NB Going Straight Fail Keep in Proper Lane Overturn / Rollover				X ↑

Rural Segment Crash Summary Sheets

Total Crashes: 29 (Sorted by Longitude)
City: near Trenton
Location: ND 1804
Start - End Date: 7/1/2019 - 6/30/2024 (5 Years)

23 USC § 407 Documents
NDDOT Reserves All Objections

LEGEND
- ▶ *Fatal*
- ▶ *Incapacitating Injury*
- ▶ *Non-Incapacitating Injury*
- ▷ *Possible Injury*
- ♦ *Wet surface*
- ❄ *Snow, Ice, Slush, Frost*
- ▲ *Crash related to work zone*
- ① *Unit number*

1. Contributing Factor
** = alcohol or drugs involved*

2. Most Harmful Event
For single vehicle crashes, the most harmful event is shown in parentheses in the "Type of Collision" column

VISION ZERO

	Crash No.	Crash Severity Date, Day Surface Conditions, Weather Lighting, Time Road Geometrics, Relation to Jct	Type of Collision	① AGE SEX CITY STATE Unit Configuration Movement (traffic control) Contributing Factor[1] Most Harmful Event[2]	Shortened Narrative	Name of Intersection	Diagram
21	1089427 1804 335.05	PDO 01/01/20 Wednesday Ice / Snow Cloudy ❄ Dark 4:30 AM Curve (on Level) Non-junction	Single Veh. (Tree)	① 42M WILLISTON ND Pickup - Van - Utility SB Negotiating Curve Tree			↓ X
22	1126493 1804 335.42	▶ Fatal 08/20/22 Saturday Dry Clear Daylight 3:32 PM Curve (on Level) Non-junction	Single Veh. (Fell/Jumped from Vehicle)	① 51M WILLISTON ND Motorcycle NB Passing Speed Fell/Jumped from Vehicle	D1 attempted to pass a line of cars stopped for a train. D1 failed to negotiate a curve and lost control. V1 ran off the road and flipped. D1 was ejected off the motorcycle and suffered fatal injuires.	RR tracks	X ↑
23	1146245	PDO 11/17/23 Friday Dry Clear Daylight 2:05 PM Curve (on Level) Non-junction	Rear End	① 37F FAIRVIEW MT Pickup - Van - Utility EB Going Straight ② U Hit and Run EB Going Straight			→→
24	1122161 1804 335.71	▶ Non-incapacitating injury 04/08/22 Friday Dry Clear Daylight 3:40 PM Straight (on Level) Railroad Crossing	Rear End	① 64M WILLISTON ND Pickup - Van - Utility SB Going Straight (RR) Defective Equipment ② 26M BISMARCK ND Pickup - Van - Utility SB Going Straight (RR)			↓ ↓
25	1081072 1804 335.79	PDO 07/15/19 Monday Dry Clear Daylight 5:21 PM Straight (on Level) Railroad Crossing	Sideswipe (Same Dir.)	① 30F WILLISTON ND Pickup - Van - Utility WB Going Straight (RR) No Insurance ② 39M BISMARCK ND 2-Axle WB Going Straight (RR)			← ←
26	1150703 1804 335.99	▶ Non-incapacitating injury 03/03/24 Sunday Ice / Snow Snow ❄ Daylight 10:29 AM Straight (on Level) Non-junction	Rear End	① 52F WILLISTON ND Pickup - Van - Utility WB Going Straight To Fast for Conditions ② 61M WILLISTON ND Truck Tractor WB Stopped Weather			←←
27	1100407 1804 336.19	PDO 10/28/20 Wednesday Dry Clear Daylight 5:45 PM Curve (on Level) Non-junction	Single Veh. (Overturn / Rollover)	① U Hit and Run SB Negotiating Curve Overturn / Rollover			↓ X
28	1115267 1804 339.98	PDO 11/25/21 Thursday Dry Clear Daylight 9:25 AM Straight (on Level) Non-junction	Rear End	① 26F WILLISTON ND Pickup - Van - Utility WB Going Straight Following too Close ② 24M WILLISTON ND Pickup - Van - Utility WB Slowing/Stopping Animal in Roadway			←←
29	1131427	▶ Non-incapacitating injury 12/12/22 Monday Ice / Snow Cloudy ❄ Daylight 4:50 PM Unknown Non-junction	Single Veh. (Other Non-Collision)	① 64M FAIRVIEW MT Pickup - Van - Utility EB Going Straight Other Non-Collision			→X
30							

Rural Segment Crash Summary Sheets

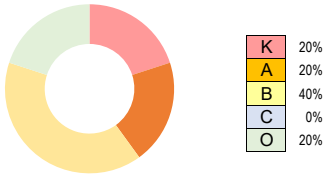
Total Crashes: 5 (Sorted by Latitude)
Location: Williams Co Rd 5, JCt ND 1804 N to Jct US 2
Reference Points: -
Start - End Date: 7/1/2019 - 6/30/2024 (5 Years)

Notes: Non-injury animal crashes were not included.

VISION ZERO

Statistics for Total Crashes

Crash Severity	Letter Code	No. of Crashes
Fatal	K	1
Incapacitating Injury	A	1
Non-incapacitating Injury	B	2
Possible Injury	C	0
Property Damage Only	O	1
		5



EPDO Score = 190

Manner of Collision			Breakdown by Severity K	A	B	C	O
Angle	0	0%	0	0	0	0	0
Rear End	0	0%	0	0	0	0	0
Left Turn	0	0%	0	0	0	0	0
Sideswipe (same dir.)	2	40%	0	0	1	0	1
Sideswipe (opp dir.)	0	0%	0	0	0	0	0
Single Vehicle	3	60%	1	1	1	0	0
Ped/Bike	0	0%	0	0	0	0	0
Head On	0	0%	0	0	0	0	0
Backing	0	0%	0	0	0	0	0
Other	0	0%	0	0	0	0	0
	5	100%	1	1	2	0	1

Surface Conditions			Breakdown by Severity K	A	B	C	O
Dry	4	80%	1	1	1	0	1
Wet	1	20%	0	0	1	0	0
Ice / Snow	0	0%	0	0	0	0	0
Other	0	0%	0	0	0	0	0
	5	100%	1	1	2	0	1

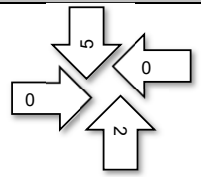
Lighting Conditions			Breakdown by Severity K	A	B	C	O
Dawn/Dusk	0	0%	0	0	0	0	0
Daylight	4	80%	1	1	1	0	1
Dark	1	20%	0	0	1	0	0
Dark (lighted)	0	0%	0	0	0	0	0
Unknown	0	0%	0	0	0	0	0
	5	100%	1	1	2	0	1

Roadway Geometrics		
Straight (on level) =	2	40%
Straight (on grade) =	2	40%
Curve (on level) =	0	0%
Curve (on grade) =	1	20%
Hill Crest =	0	0%
Unknown =	0	0%
	5	

V1 and V2 Configuration*	
Passenger Car =	1
PU / Van / Utility =	3
Truck =	2
Bus / Motorhome =	0
Motorcycle + Moped =	1
Ped or Bike =	0

These are only the most popular choices.

V1 and V2 Directions

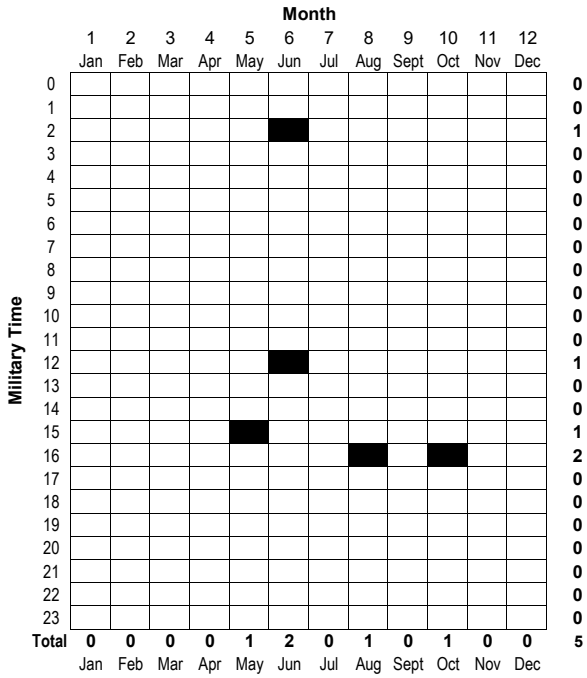


NB = 2
SB = 5
EB = 0
WB = 0

D1 and D2 Alcohol / Drugs*

Yes (alcohol or drugs present) = 2

Month



Under Construction		
Yes =	0	0%

D1 and D2 Contr. Factors*	
Attention Distracted =	0
Weather =	0
Speed =	1
Too Fast for Conditions =	1
Fail to Yield =	0
Improper Backing/Turning =	0

These are only the most popular choices.

First Harmful Event		
Motor Vehicle in Transport =	2	40%
Animal =	0	0%
Jackknife =	0	0%
Ran Off Roadway (not including below crashes) =	2	40%
Guardrail + Concrete Barrier + Bridge Rail =	0	0%
Bridge / Pier / Abutment / Overhead Structure =	0	0%
Poles / Posts / Trees / Overhead Sign Supports =	1	20%

These are only the most popular choices.

Day of Week		
Monday =	0	0%
Tuesday =	0	0%
Wednesday =	1	20%
Thursday =	0	0%
Friday =	1	20%
Saturday =	1	20%
Sunday =	2	40%
	5	

Relation to Junction		
Non-Junction =	2	40%
Intersection + Intersection-Related =	2	40%
Alley / Driveway Access =	1	20%
Interchange Area + Exit / Entrance Ramp =	0	0%

These are only the most popular choices.

D1 or D2 Ejected*	
Yes (partially or fully) =	1

This info is not available for all units.

D1 and D2 Age/Sex			
Age	M	F	Total
0-17	0	0	0
18-20	0	1	1
21-24	0	0	0
25-34	1	0	1
35-44	2	0	2
45-54	1	0	1
55-64	2	0	2
65-74	0	0	0
75+	0	0	0
	6	1	7

Yr	Start Date	End Date	Intersection? YES (or Alley / Drvwy)	NO Single Veh	NO Mult. Veh	Total	Severity K	A	B	C	O	Surface Conditions Dry	Wet	Ice/Snow	Work Zone
1	7/1/19	6/30/20		1		1		1				1			
2	7/1/20	6/30/21	1			1			1				1		
3	7/1/21	6/30/22													
4	7/1/22	6/30/23		1		1	1					1			
5	7/1/23	6/30/24	2			2			1		1	2			
			3 (60.0%)	2 (40.0%)	0 (0.0%)	**5**	1	1	2		1	4	1		

Vision Zero Emphasis Areas
3 Lane Departure Crashes
3 Intersection Crashes
1 Alcohol and/or Drug Related Crashes
1 Unbelted Vehicle Occupant Crashes
2 Speed Related Crashes
1 Young Driver Crashes

Rural Segment Crash Summary Sheets

Total Crashes: 5 (Sorted by Latitude)
Location: Williams Co Rd 5, JCt ND 1804 N to Jct US 2
Reference Points: -
Start - End Date: 7/1/2019 - 6/30/2024 (5 Years)

Notes: Non-injury animal crashes were not included.

23 USC § 407 Documents
NDDOT Reserves All Objections

VISION ZERO

Statistics for Intersection-Related Crashes ONLY

Crash Severity

K =	0	0%
A =	0	0%
B =	2	67%
C =	0	0%
O =	1	33%
	3	

Surface Conditions

Dry =	2	67%
Wet =	1	33%
Ice / Snow =	0	0%
Other =	0	0%

Lighting Conditions

Dawn =	0	0%
Daylight =	2	67%
Dusk =	0	0%
Dark =	1	33%
Dark (lighted) =	0	0%

Under Construction

Yes =	0	0%

Relation to Junction

Intersection + Intersection-Related =	2	67%
Alley / Driveway Access =	1	33%

Manner of Collision

Angle =	0	0%
Rear End =	0	0%
Left Turn =	0	0%
Sideswipe (same direction) =	2	67%
Single Vehicle =	1	33%
Ped / Bike =	0	0%
Other =	0	0%

D1 and D2 Contributing Factors*

Attention Distracted =	0
Weather =	0
Speed =	1
Too Fast for Conditions =	0
Fail to Yield =	0
Improper Backing / Turning =	0

These are only the most popular choices.

D1 and D2 Alcohol / Drugs Present*

Yes (alcohol or drugs) =	1

V1 and V2 Unit Config.*

Passenger Car =	1
PU / Van / Utility =	2
Truck =	2
Bus / Motorhome =	0
Motorcycle + Moped =	0

These are only the most popular choices.

V1 and V2 Traffic Control

	V1	V2
Signal =	0	0
Stop =	1	0
Beacon =	0	0

These are only the most popular choices.

**This info is not available for all units.*

Statistics for Non-Intersection Crashes ONLY

Multiple Vehicle Crashes ONLY

Crash Severity

K =	0	#DIV/0!
A =	0	#DIV/0!
B =	0	#DIV/0!
C =	0	#DIV/0!
O =	0	#DIV/0!
	0	

Surface Conditions

Dry =	0	#DIV/0!
Wet =	0	#DIV/0!
Ice / Snow =	0	#DIV/0!
Other =	0	#DIV/0!

Lighting Conditions

Dawn =	0	#DIV/0!
Daylight =	0	#DIV/0!
Dusk =	0	#DIV/0!
Dark =	0	#DIV/0!
Dark (lighted) =	0	#DIV/0!

Road Geometrics

Straight (on level) =	0	#DIV/0!
Straight (on grade) =	0	#DIV/0!
Curve (on level) =	0	#DIV/0!
Curve (on grade) =	0	#DIV/0!
Hill Crest =	0	#DIV/0!

Under Construction

Yes =	0	#DIV/0!

D1 or D2 Ejected*

Yes =	0

Manner of Collision

Angle =	0	#DIV/0!
Rear End =	0	#DIV/0!
Left Turn =	0	#DIV/0!
Sideswipe (same direction) =	0	#DIV/0!
Head-On + Sideswipe (opp direction) =	0	#DIV/0!
Other =	0	#DIV/0!

D1 and D2 Alcohol/Drugs Present*

Yes (alcohol or drugs) =	0

V1 and V2 Unit Config.*

Passenger Car =	0
PU / Van / Utility =	0
Truck =	0
Bus / Motorhome =	0
Motorcycle + Moped =	0

These are only the most popular choices.

Non-Collision with Motor Vehicle (a.k.a. Single Vehicle) Crashes ONLY

Crash Severity

K =	1	50%
A =	1	50%
B =	0	0%
C =	0	0%
O =	0	0%
	2	

Surface Conditions

Dry =	2	100%
Wet =	0	0%
Ice / Snow =	0	0%
Other =	0	0%

Lighting Conditions

Dawn =	0	0%
Daylight =	2	100%
Dusk =	0	0%
Dark =	0	0%
Dark (lighted) =	0	0%

Road Geometrics

Straight (on level) =	1	50%
Straight (on grade) =	0	0%
Curve (on level) =	0	0%
Curve (on grade) =	1	50%
Hill Crest =	0	0%

Under Construction

Yes =	0	0%

D1 Ejected*

Yes (partially or fully) =	1	50%

D1 Most Harmful Event*

Motor Vehicle in Transport =	0	0%
Animal =	0	0%
Jackknife =	0	0%
Ran Off Roadway (not including below crashes) =	2	100%
Guardrail + Concrete Barrier + Bridge Rail =	0	0%
Bridge / Pier / Abutment / Overhead Structure =	0	0%
Poles / Posts / Trees / Overhead Sign Supports =	0	0%

These are only the most popular choices.

D1 Alcohol / Drugs Present*

Yes (alcohol or drugs) =	1	50%

V1 Unit Config.*

Passenger Car =	0	0%
PU / Van / Utility =	1	50%
Truck =	0	0%
Bus / Motorhome =	0	0%
Motorcycle + Moped =	1	50%

These are only the most popular choices.

**This info is not available for all units.*

Rural Segment Crash Summary Sheets

Total Crashes: 5 (Sorted by Latitude)
City:
Location: Williams Co Rd 5, JCt ND 1804 N to Jct US 2
Start - End Date: 7/1/2019 - 6/30/2024 (5 Years)

23 USC § 407 Documents
NDDOT Reserves All Objections

LEGEND
- ▶ *Fatal*
- ▶ *Incapacitating Injury*
- ▶ *Non-Incapacitating Injury*
- ▷ *Possible Injury*
- ♦ *Wet surface*
- ❄ *Snow, Ice, Slush, Frost*
- ▲ *Crash related to work zone*
- ① *Unit number*

1. Contributing Factor
** = alcohol or drugs involved*

2. Most Harmful Event
For single vehicle crashes, the most harmful event is shown in parentheses in the "Type of Collision" column

VISION ZERO

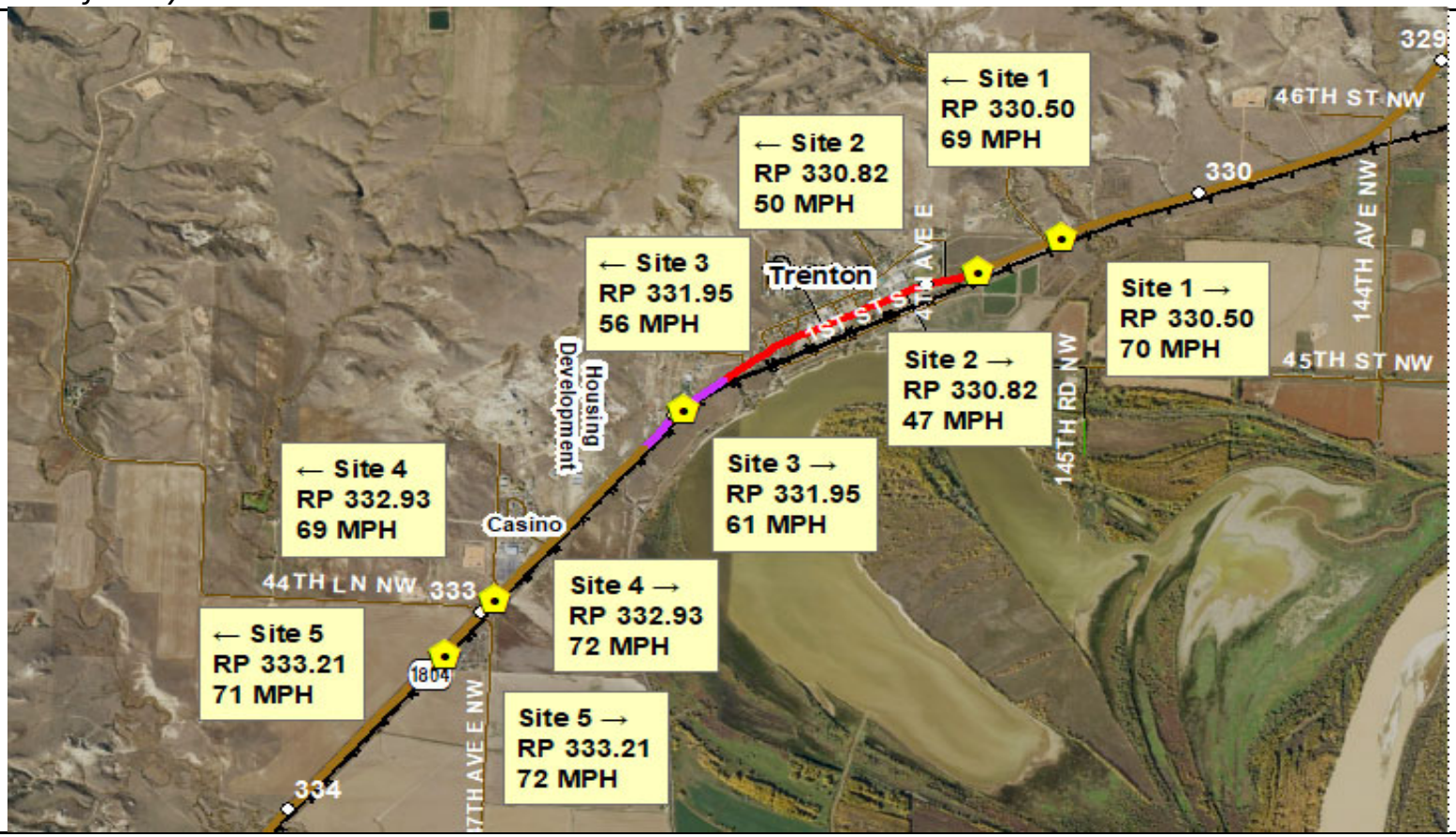
	Crash No.	Crash Severity Date, Day Surface Conditions, Weather Lighting, Time Road Geometrics, Relation to Jct	Type of Collision	① AGE SEX CITY STATE Unit Configuration Movement (traffic control) Contributing Factor[1] Most Harmful Event[2]	Shortened Narrative	Name of Intersection	Diagram
1	1109143	▶ Non-incapacitating injury 06/20/21 Sunday Wet Clear ♦ Dark 2:06 AM Straight (on Grade) Intersection	Single Veh. (Fence)	① 19F GRANTS PASS OR Pickup - Van - Utility SB Going Straight (Stop) Speed * Fence		ND 1804 & Co Rd 5	↓ X
2	1083069	▶ Incapacitating Injury 08/24/19 Saturday Dry Clear Daylight 4:50 PM Curve (on Grade) Non-junction	Single Veh. (Overturn / Rollover)	① 46M SIDNEY MTY Motorcycle SB Going Straight To Fast for Conditions Overturn / Rollover	D1 attempted to pass a vehicle on a downhill vertical grade. D1 failed to negotiate the horizontal curve at the bottom of the vertical grade and ran off the road. D1 & P1 were ejected off the motorcycle.		↓ X
3	1153852	▶ Non-incapacitating injury 06/02/24 Sunday Dry Clear Daylight 12:50 PM Straight (on Grade) Alley/Driveway	Sideswipe (Same Dir.)	① 42M LAUREL MT Passenger Car NB Going Straight Care Required ② 40M HOMESTEAD MT Pickup - Van - Utility NB Turning Left		Co Rd 5 & Private Drive	↑↑
4	1128724	▶ Fatal 10/14/22 Friday Dry Clear Daylight 4:28 PM Straight (on Level) Non-junction	Single Veh. (Overturn / Rollover)	① 64M BELCOURT ND Pickup - Van - Utility SB Going Straight Other* Overturn / Rollover	D1 ran off the road and overcorrected. V1 ran off the road and rolled twice and landed in the ditch. D1 suffered fatal injuries. Passenger suffered minor injuries.		↓ X
5	1152748	PDO 05/01/24 Wednesday Dry Clear Daylight 3:05 PM Straight (on Level) Intersection	Sideswipe (Same Dir.)	① 63M WILLISTON ND Truck Tractor SB Turning Left ② 31M WILLISTON ND Unknown Heavy Truck SB Passing Improper Overtaking Other Non-Collision		Co Rd 5 & Private Drive	↓↓
6							
7							
8							
9							
10							

Speed Zone Engineering Study

REF #	2024 RSR	Nearest City	Trenton
PCN		Hwy and RP	ND 1804, RP 330-334
Analyst	L. Norby	What Prompted Study	Request

23 USC § 407 Documents
NDDOT Reserves All Objections

Aerial Photo of Study Area



Speed Limit History for Area

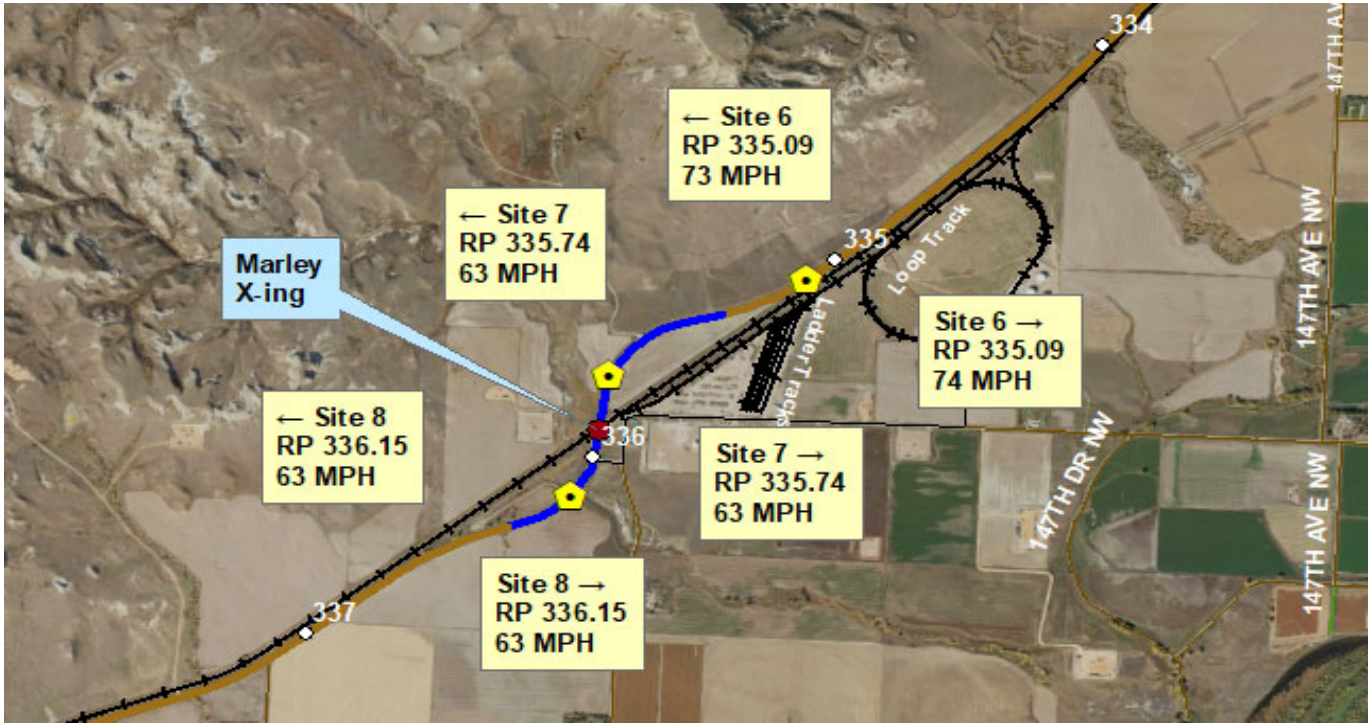
Date	Speed Limit	Site #	85th % Speed (mph)		50th % Speed (mph)		Change to Posted Speed	Speed Order #
			EB	WB	EB	WB		
5/14/2024	65	1	70	69	62	60		
5/14/2024	45	2	47	50	38	42		
5/14/2024	45	3	61	56	56	49		
5/14/2024	65	4	72	69	66	64		
5/14/2024	65	5	72	71	67	66		

Speed Zone Engineering Study

REF #	2024 RSR	Nearest City	Trenton
PCN		Hwy and RP	ND 1804, 334-337
Analyst	L. Norby	What Prompted Study	Request

23 USC § 407 Documents
NDDOT Reserves All Objections

Aerial Photo of Study Area



Speed Limit History for Area

Date	Speed Limit	Site #	85th % Speed (mph)		50th % Speed (mph)		Change to Posted Speed	Speed Order #
			EB	WB	EB	WB		
5/14/2024	65	6	74	73	69	68		
5/14/2024	50	7	63	63	57	57		
5/14/2024	50	8	63	63	56	57		

Intersection Traffic Volumes

North Dakota Department of Transportation
SFN 7921 (Rev. 4-85)

Intersection No. 1

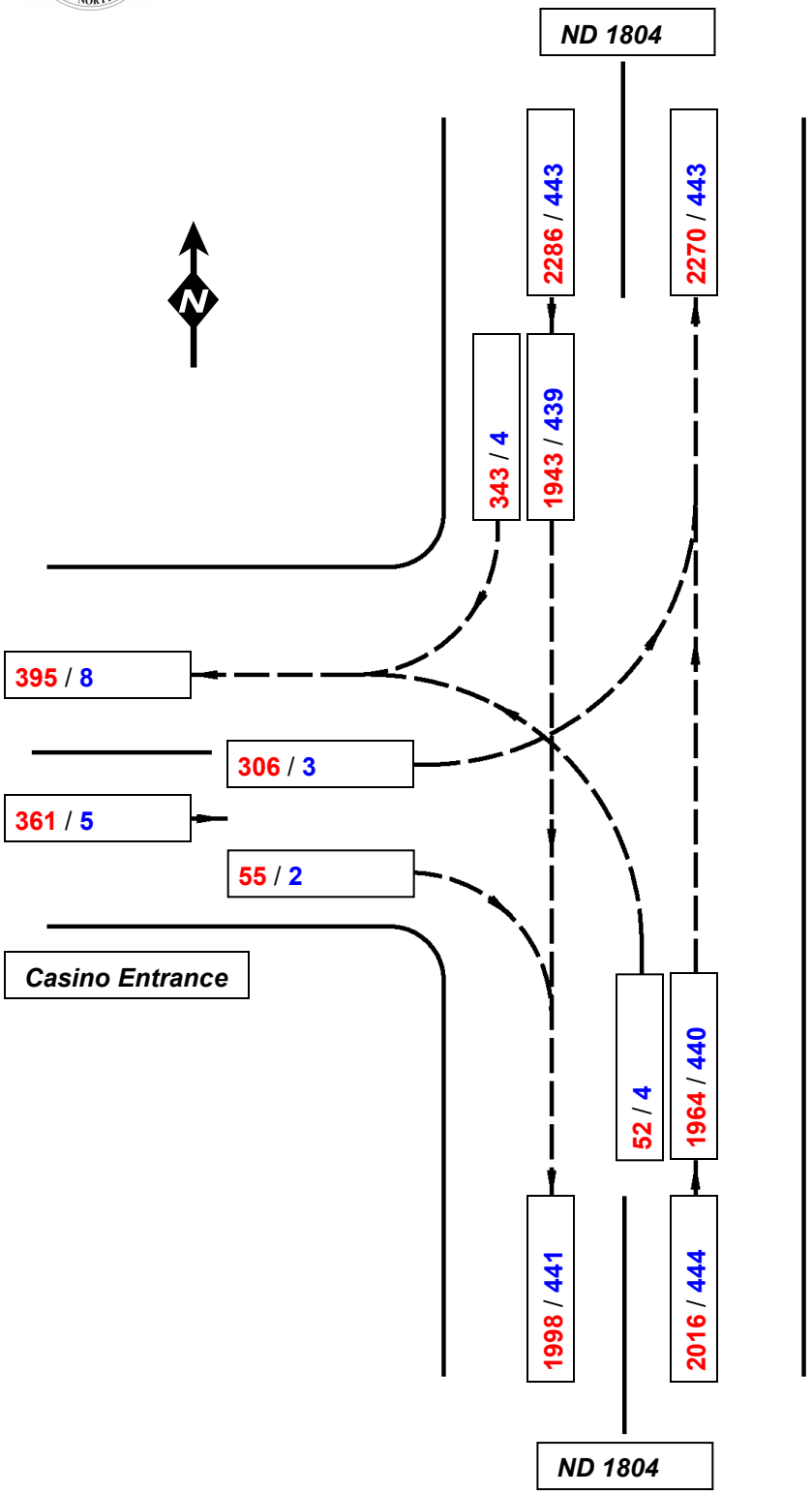
Description:
Int. ND 1804 & Casino Entrance
RP 332.00@ 0.75 (ND 1804)

Hours 24

Date 07/16/2024

Note: Traffic estimate is based on 2024 Miovision traffic counts.

Note: Preliminary numbers using 2023 seasonal factors



LEGEND: AADT / TRUCKS - 2024

Completed by NR

Intersection Traffic Volumes

North Dakota Department of Transportation
SFN 7921 (Rev. 4-85)

Intersection No. 1

Description:
Int. ND 1804 & Casino Entrance
RP 332.00@ 0.75 (ND 1804)

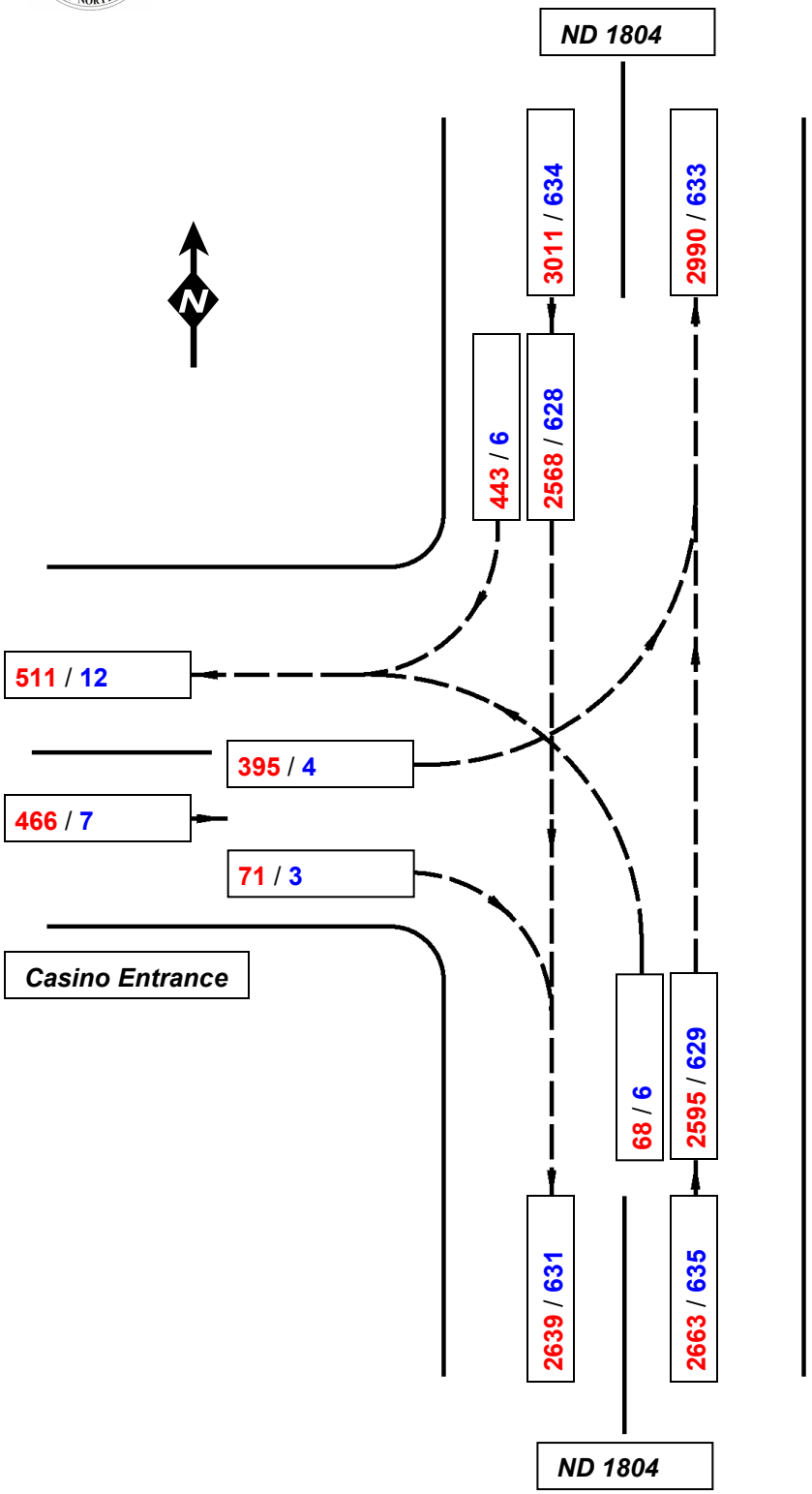
Hours 24

Date 07/16/2024

Note: Traffic estimate is based on 2024 Miovision traffic counts.

Note: Preliminary numbers using 2023 seasonal factors

Note: Growth rate for all vehicles is 1.30%. Growth rate for trucks is 1.80%.



LEGEND: AADT / TRUCKS - 2044

Completed by NR

Intersection Traffic Volumes

North Dakota Department of Transportation
SFN 7921 (Rev. 4-85)

Intersection No. 2

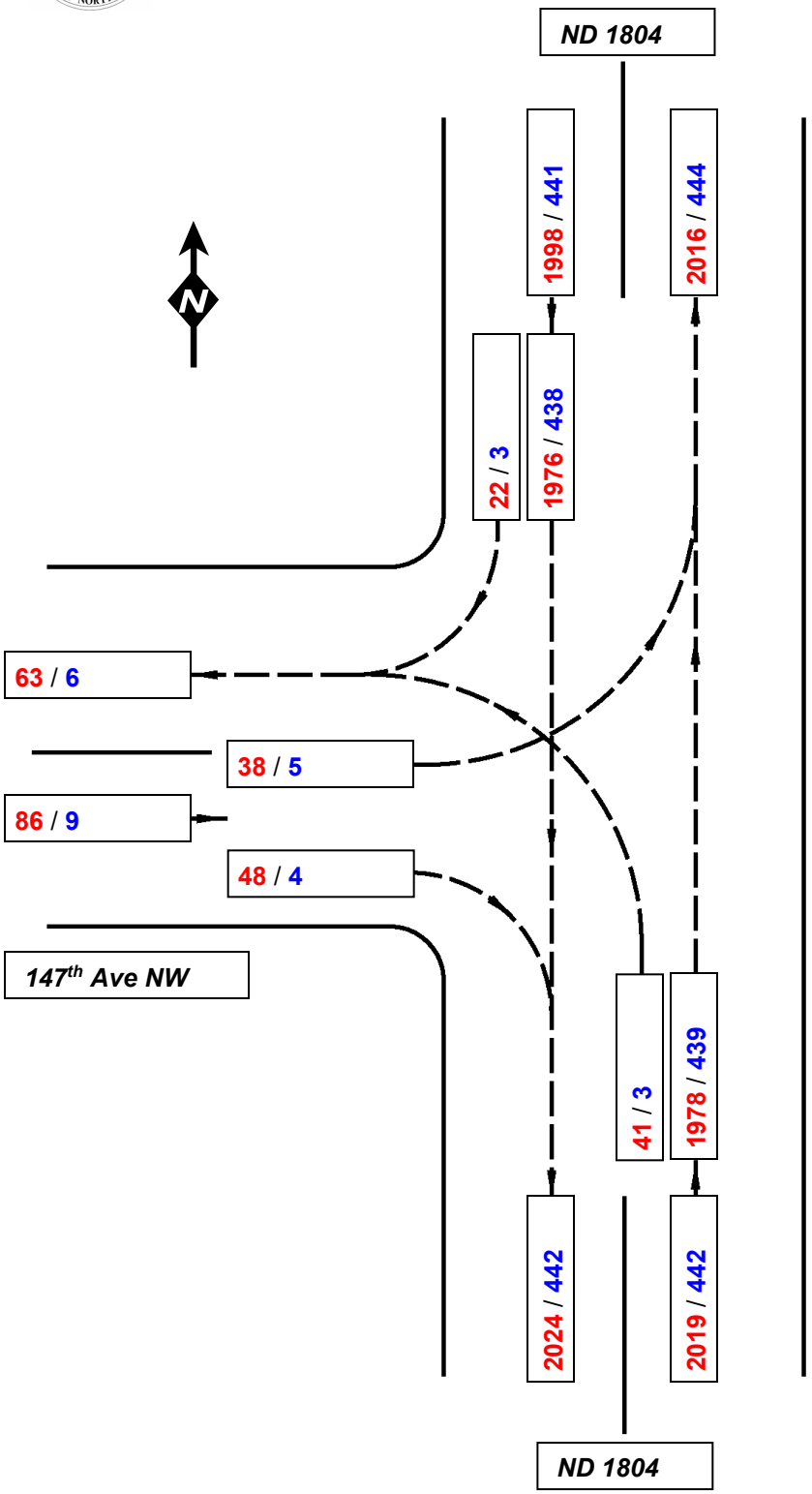
Description:
Int. ND 1804 & 147th Ave NW
RP 332.00@ 0.9 (ND 1804)

Hours 24

Date 07/16/2024

Note: Traffic estimate is based on 2024 Miovision traffic counts.

Note: Preliminary numbers using 2023 seasonal factors



LEGEND: AADT / TRUCKS - 2024

Completed by NR

Intersection Traffic Volumes

North Dakota Department of Transportation
SFN 7921 (Rev. 4-85)

Intersection No. 2

Description:
Int. ND 1804 & 147th Ave NW
RP 332.00@ 0.9 (ND 1804)

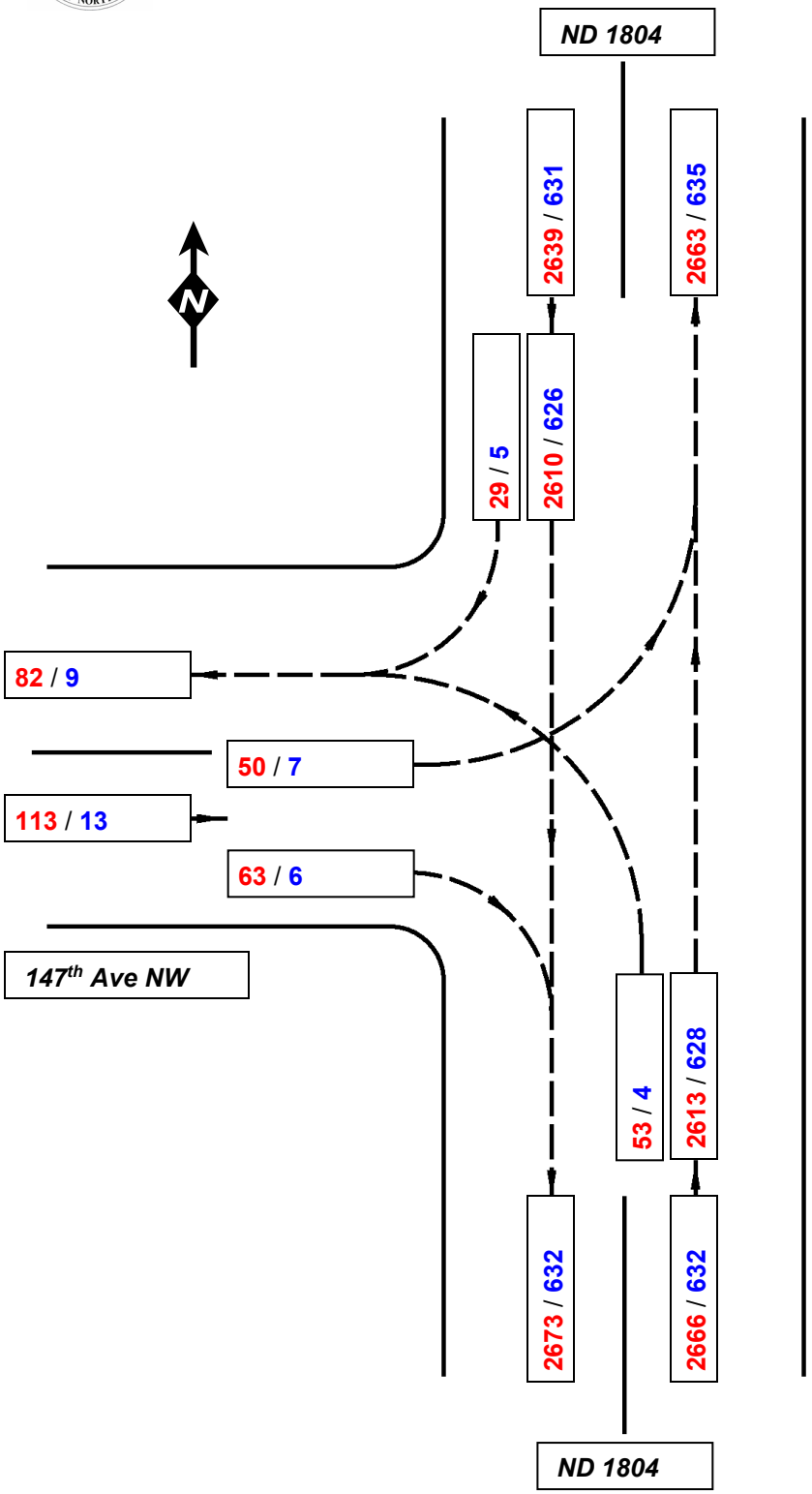
Hours 24

Date 07/16/2024

Note: Traffic estimate is based on 2024 Miovision traffic counts.

Note: Preliminary numbers using 2023 seasonal factors

Note: Growth rate for all vehicles is 1.30%. Growth rate for trucks is 1.80%.



LEGEND: AADT / TRUCKS - 2044

Completed by NR

Intersection Traffic Volumes

North Dakota Department of Transportation
SFN 7921 (Rev. 4-85)

Intersection No: 3

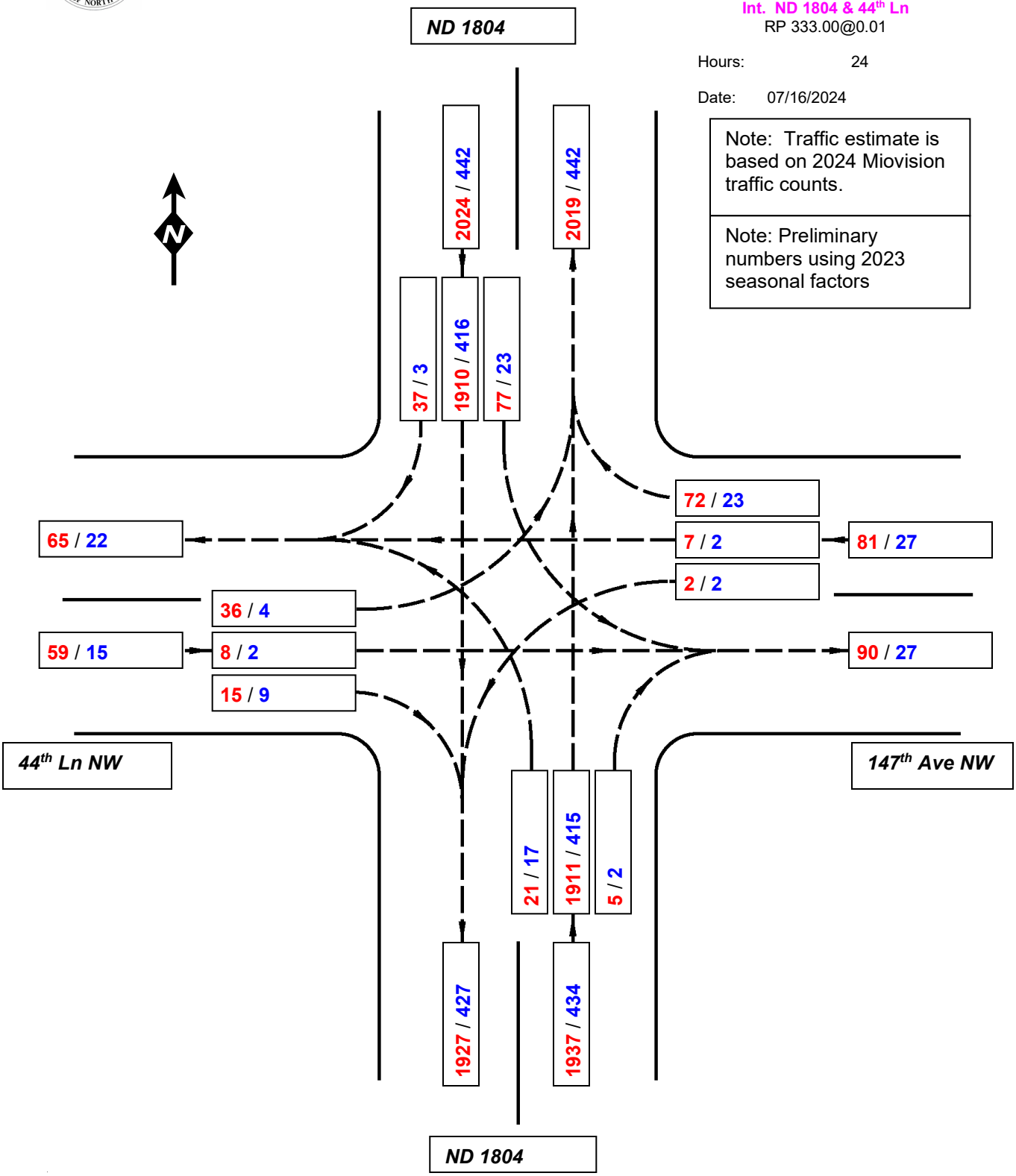
Description
Int. ND 1804 & 44th Ln
RP 333.00@0.01

Hours: 24

Date: 07/16/2024

Note: Traffic estimate is based on 2024 Miovision traffic counts.

Note: Preliminary numbers using 2023 seasonal factors



LEGEND: AADT / TRUCKS - 2024

Completed by NR

Intersection Traffic Volumes

North Dakota Department of Transportation
SFN 7921 (Rev. 4-85)

Intersection No: 3

Description
Int. ND 1804 & 44th Ln
RP 333.00@0.01

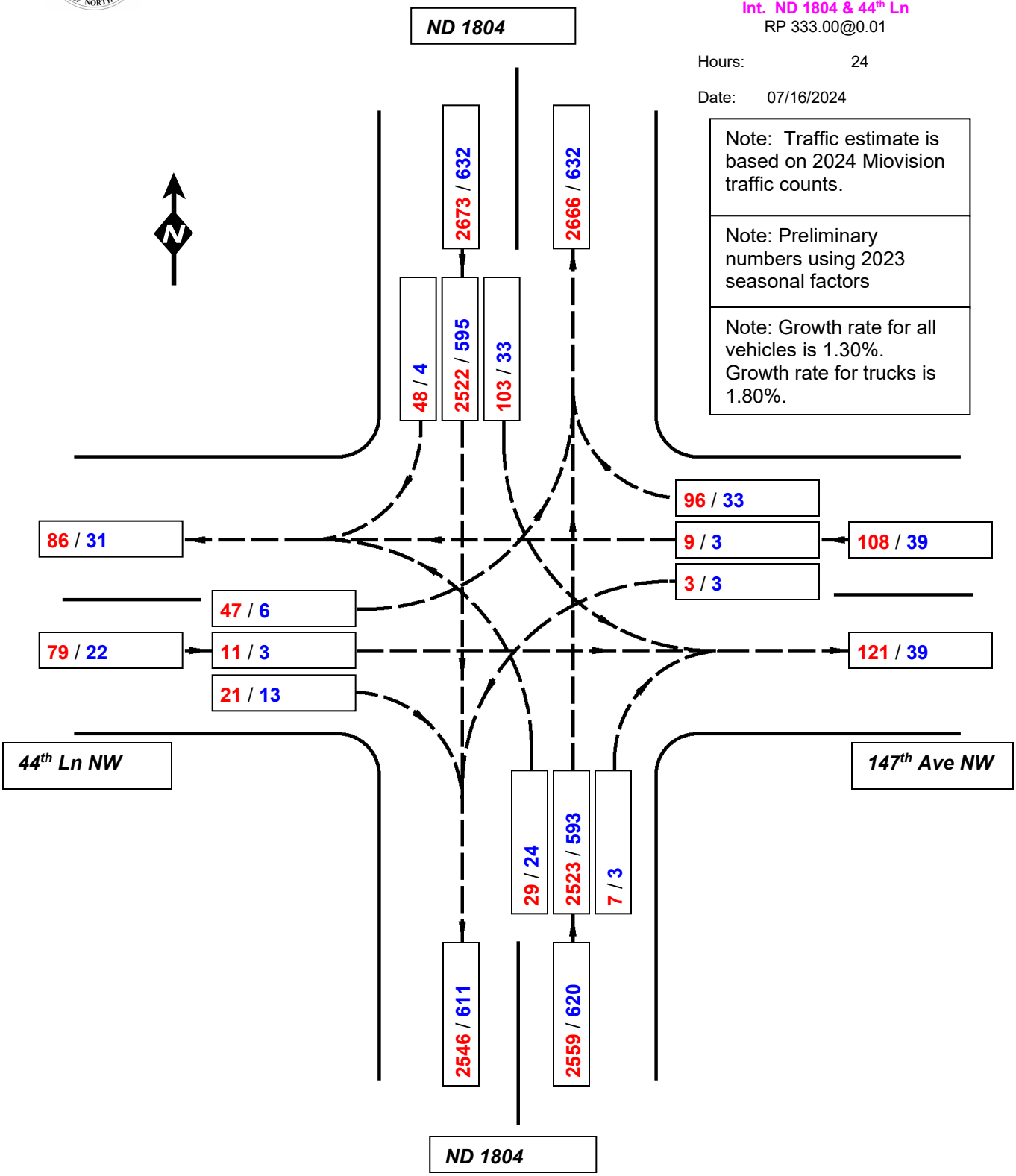
Hours: 24

Date: 07/16/2024

Note: Traffic estimate is based on 2024 Miovision traffic counts.

Note: Preliminary numbers using 2023 seasonal factors

Note: Growth rate for all vehicles is 1.30%. Growth rate for trucks is 1.80%.



LEGEND: AADT / TRUCKS - 2044

Completed by NR

Intersection Traffic Volumes

North Dakota Department of Transportation
SFN 7921 (Rev. 4-85)

Intersection No. 4

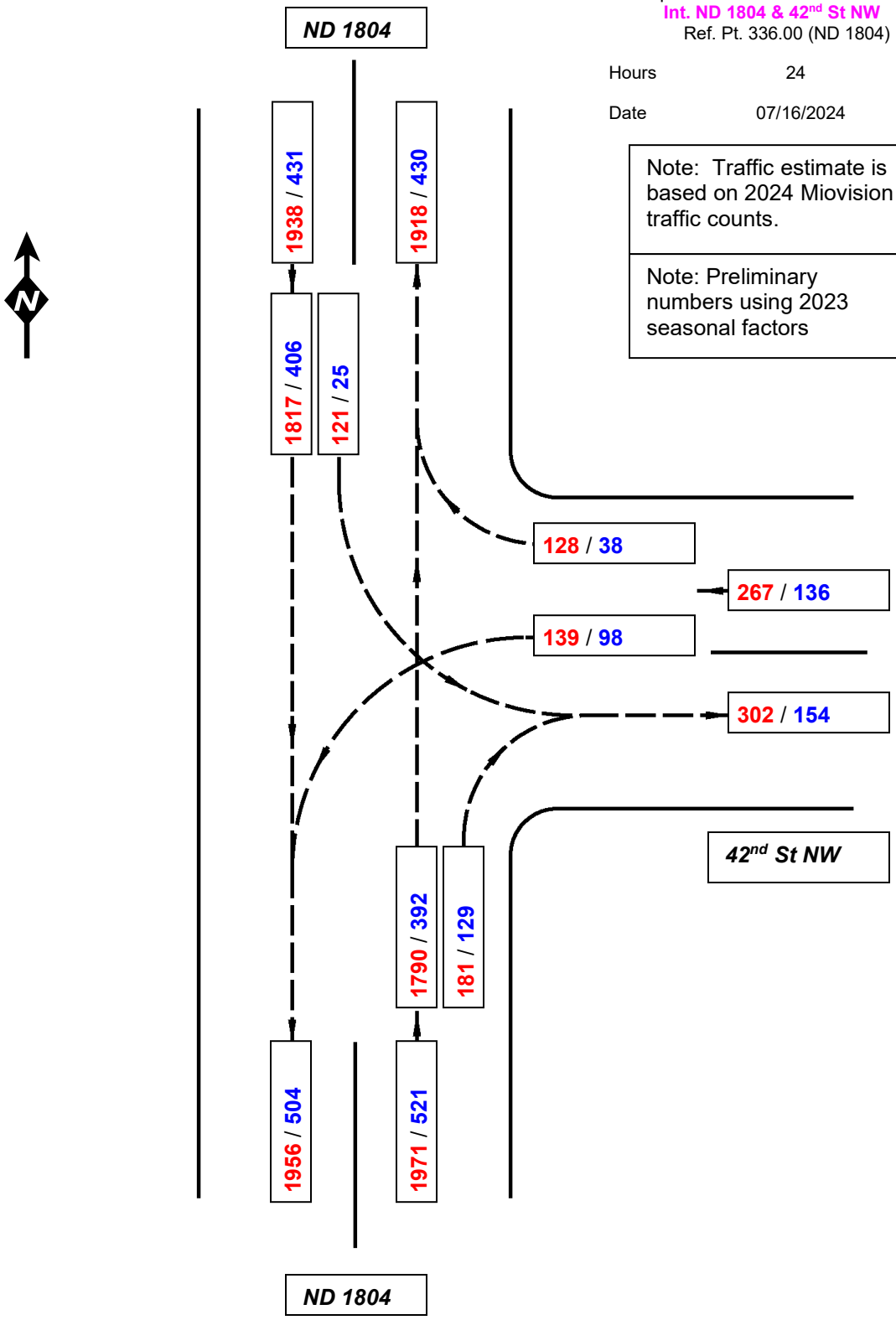
Description
Int. ND 1804 & 42nd St NW
Ref. Pt. 336.00 (ND 1804)

Hours 24

Date 07/16/2024

Note: Traffic estimate is based on 2024 Miovision traffic counts.

Note: Preliminary numbers using 2023 seasonal factors



LEGEND: AADT / TRUCKS - 2024

Completed by NR

Intersection Traffic Volumes

North Dakota Department of Transportation
SFN 7921 (Rev. 4-85)

Intersection No. 4

Description
Int. ND 1804 & 42nd St NW
Ref. Pt. 336.00 (ND 1804)

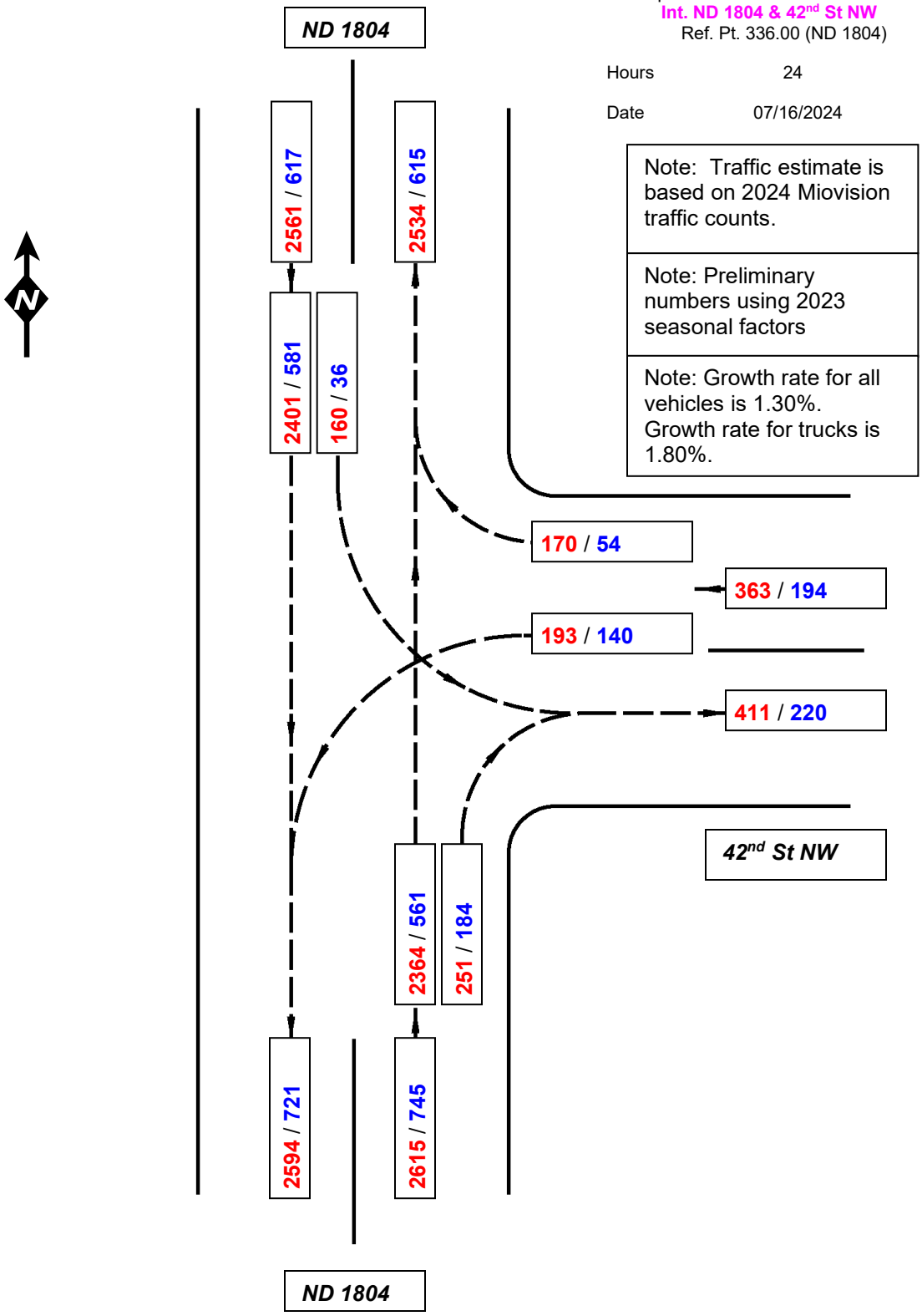
Hours 24

Date 07/16/2024

Note: Traffic estimate is based on 2024 Miovision traffic counts.

Note: Preliminary numbers using 2023 seasonal factors

Note: Growth rate for all vehicles is 1.30%. Growth rate for trucks is 1.80%.



LEGEND: AADT / TRUCKS - 2044

Completed by NR

Intersection Traffic Volumes

North Dakota Department of Transportation
SFN 7921 (Rev. 4-85)

Intersection No: 5

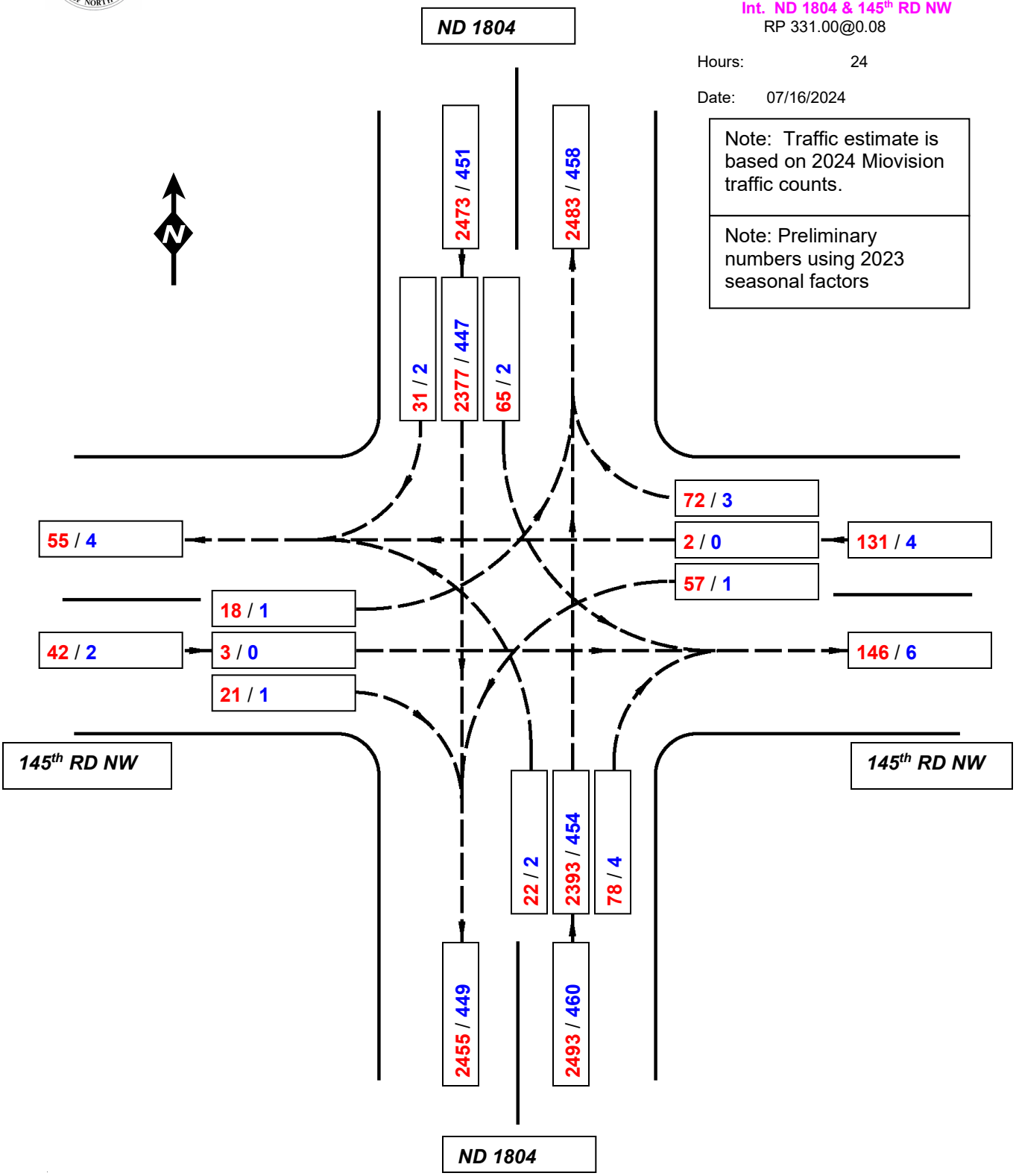
Description
Int. ND 1804 & 145th RD NW
RP 331.00@0.08

Hours: 24

Date: 07/16/2024

Note: Traffic estimate is based on 2024 Miovision traffic counts.

Note: Preliminary numbers using 2023 seasonal factors



LEGEND: AADT / TRUCKS - 2024

Completed by NR

Intersection Traffic Volumes

North Dakota Department of Transportation
SFN 7921 (Rev. 4-85)

Intersection No: 5

Description
Int. ND 1804 & 145th RD NW
RP 331.00@0.08

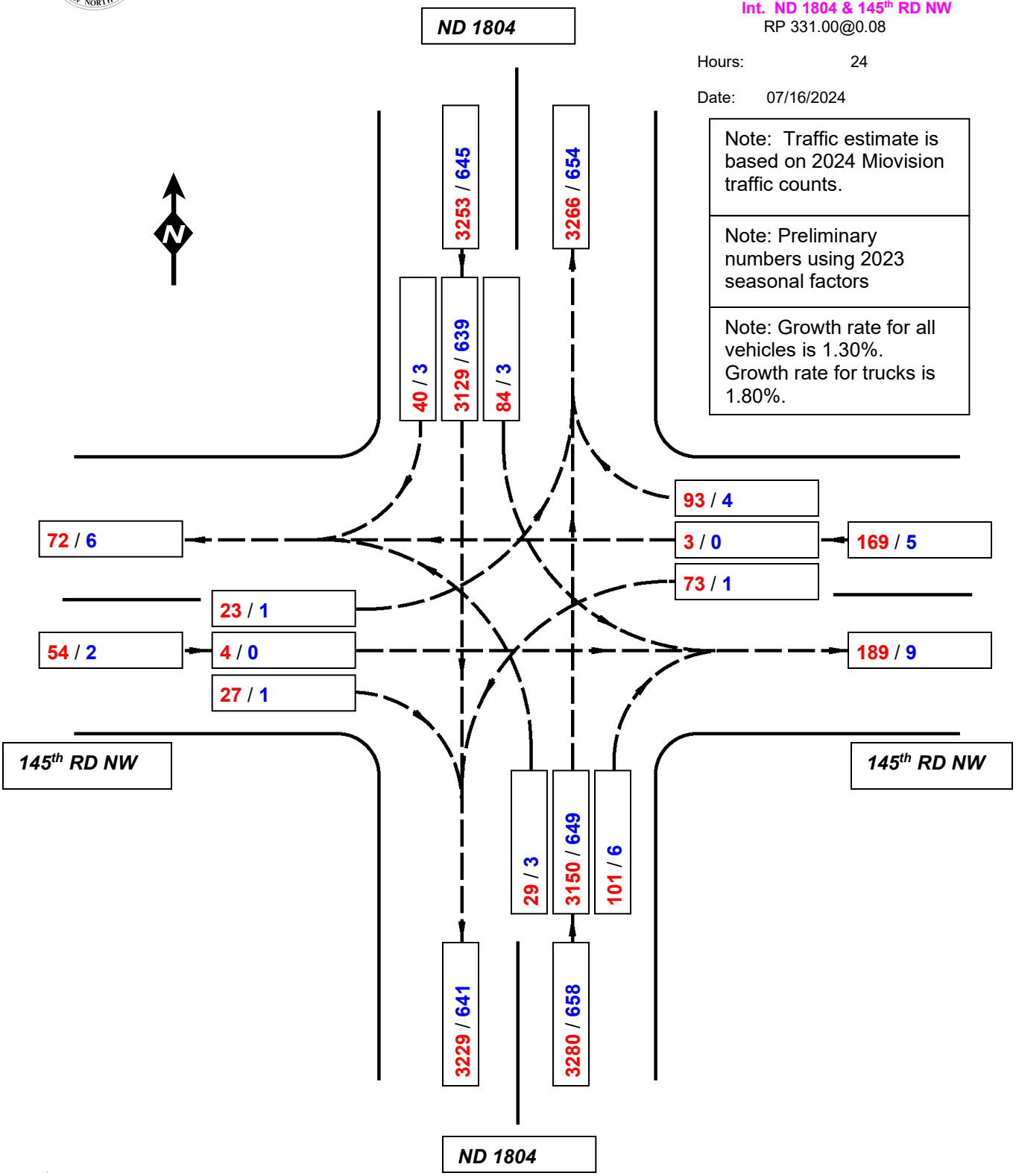
Hours: 24

Date: 07/16/2024

Note: Traffic estimate is based on 2024 Miovision traffic counts.

Note: Preliminary numbers using 2023 seasonal factors

Note: Growth rate for all vehicles is 1.30%. Growth rate for trucks is 1.80%.



LEGEND: AADT / TRUCKS - 2044

Completed by NR

Intersection Traffic Volumes

North Dakota Department of Transportation
SFN 7921 (Rev. 4-85)

Intersection No. 6

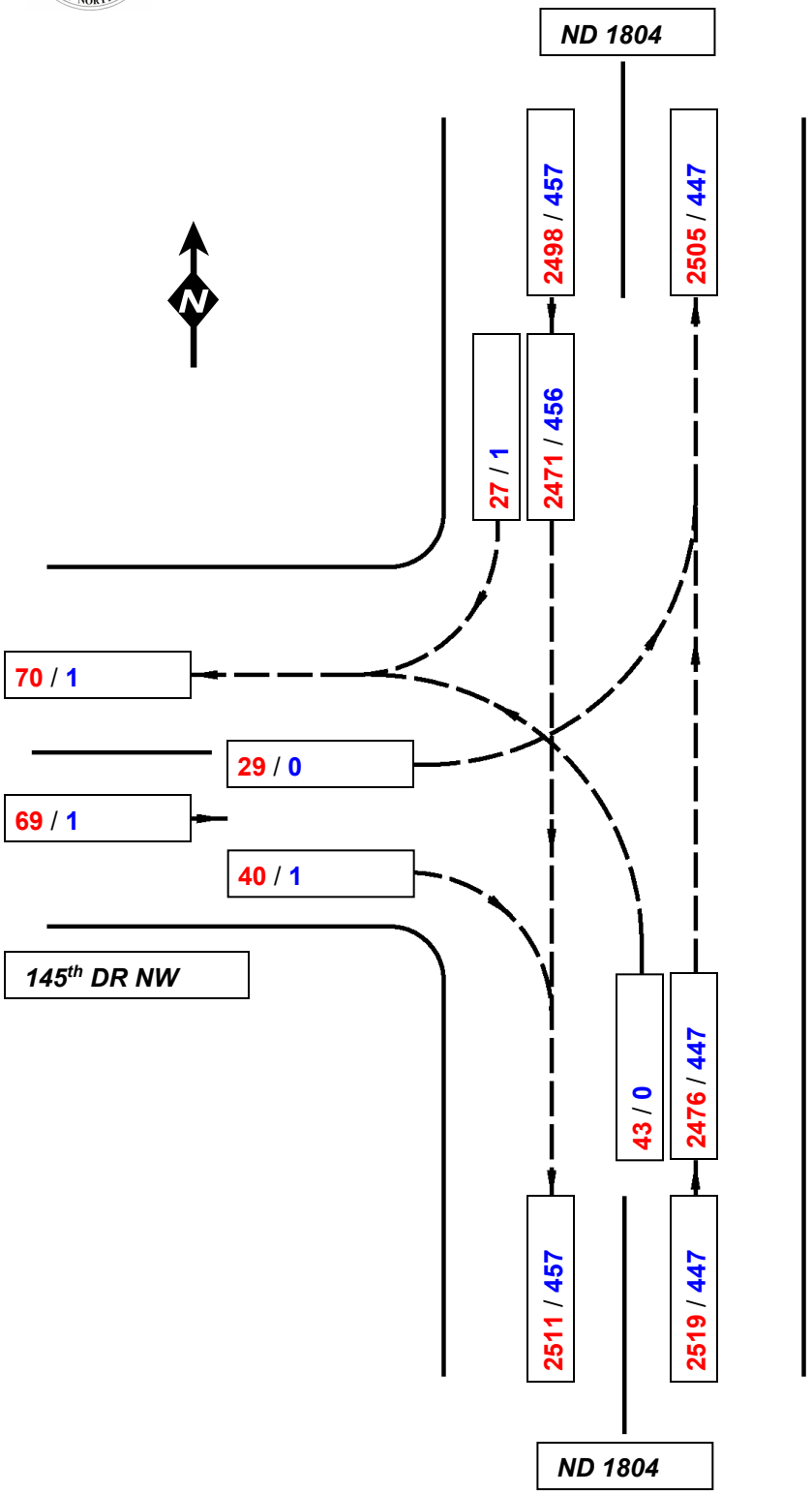
Description:
Int. ND 1804 & 145th DR NW
RP 330.00@ 0.55 (ND 1804)

Hours 24

Date 07/16/2024

Note: Traffic estimate is based on 2024 Miovision traffic counts.

Note: Preliminary numbers using 2023 seasonal factors



LEGEND: AADT / TRUCKS - 2024

Completed by NR

Intersection Traffic Volumes

North Dakota Department of Transportation
SFN 7921 (Rev. 4-85)

Intersection No. 6

Description:
Int. ND 1804 & 145th DR NW
RP 330.00@ 0.55 (ND 1804)

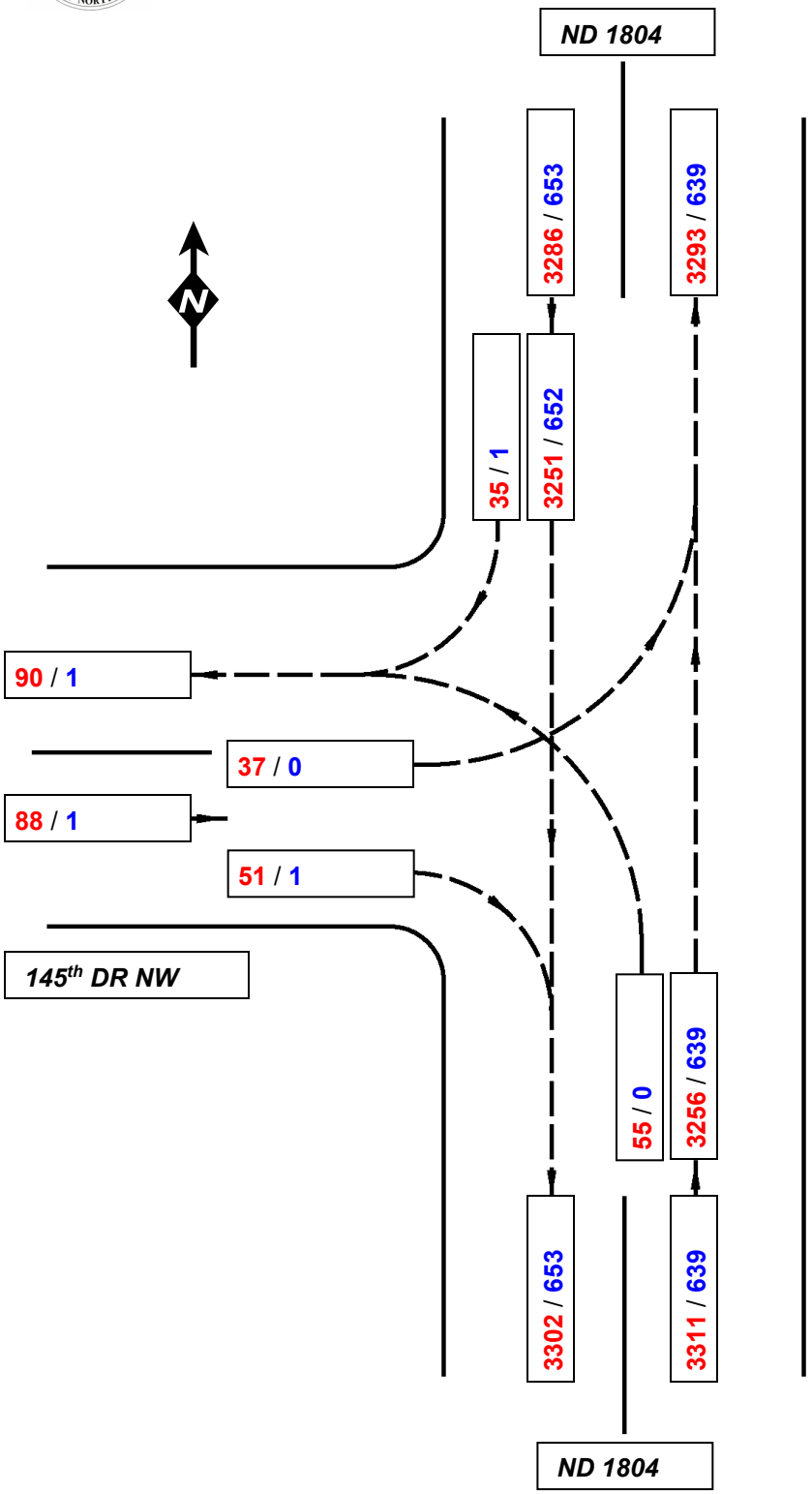
Hours 24

Date 07/16/2024

Note: Traffic estimate is based on 2024 Miovision traffic counts.

Note: Preliminary numbers using 2023 seasonal factors

Note: Growth rate for all vehicles is 1.30%. Growth rate for trucks is 1.80%.



LEGEND: AADT / TRUCKS - 2044

Completed by NR

Intersection Traffic Volumes

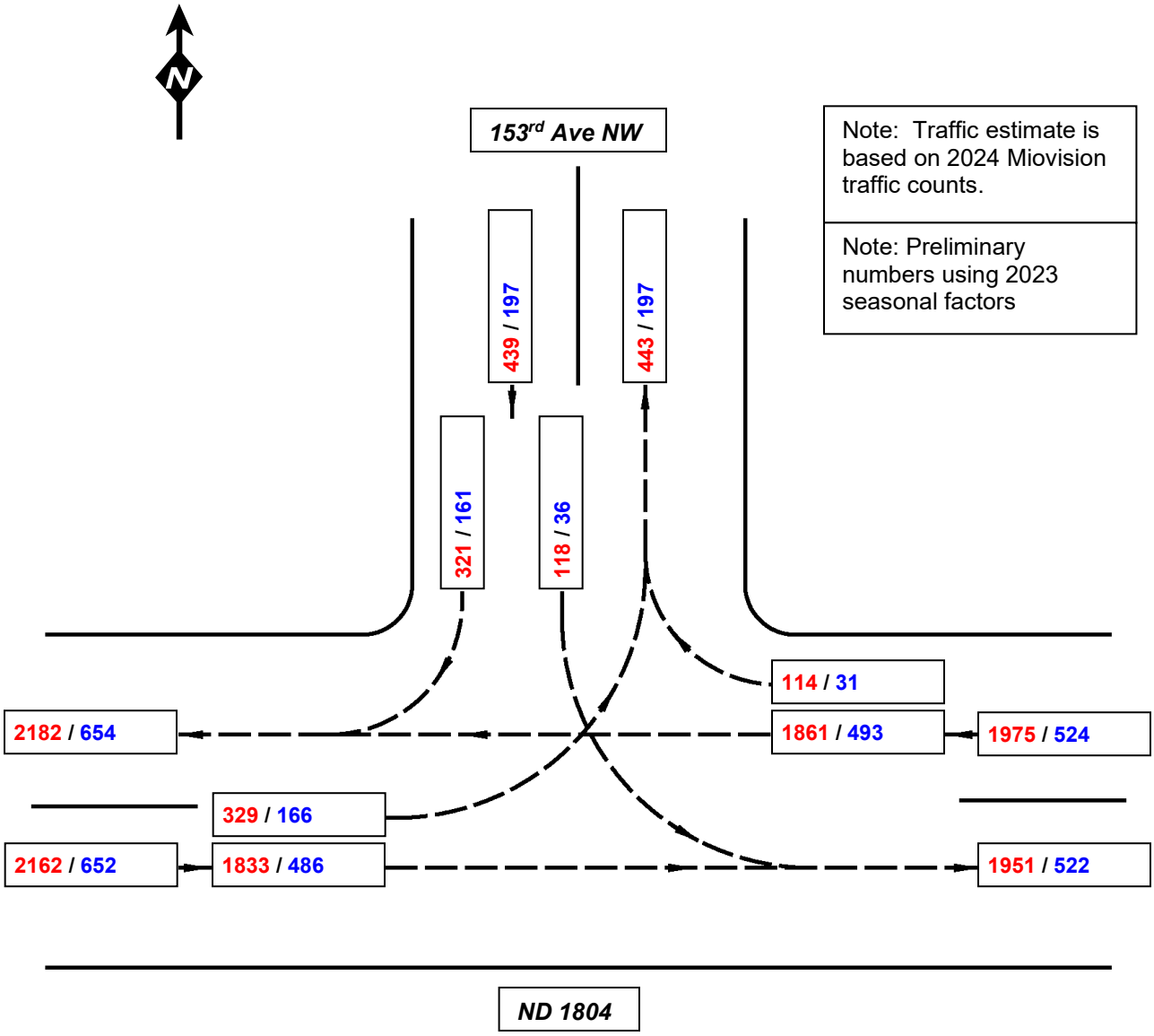
North Dakota Department of Transportation
SFN 7921 (Rev. 4-85)

Intersection No. 7

Description:
Int. ND 1804 & 153rd Ave NW
RP 340.00@0.57

Hours: 24

Date: 07/16/2024



Note: Traffic estimate is based on 2024 Miovision traffic counts.

Note: Preliminary numbers using 2023 seasonal factors

LEGEND: AADT / TRUCKS - 2024

Completed by NR

Intersection Traffic Volumes

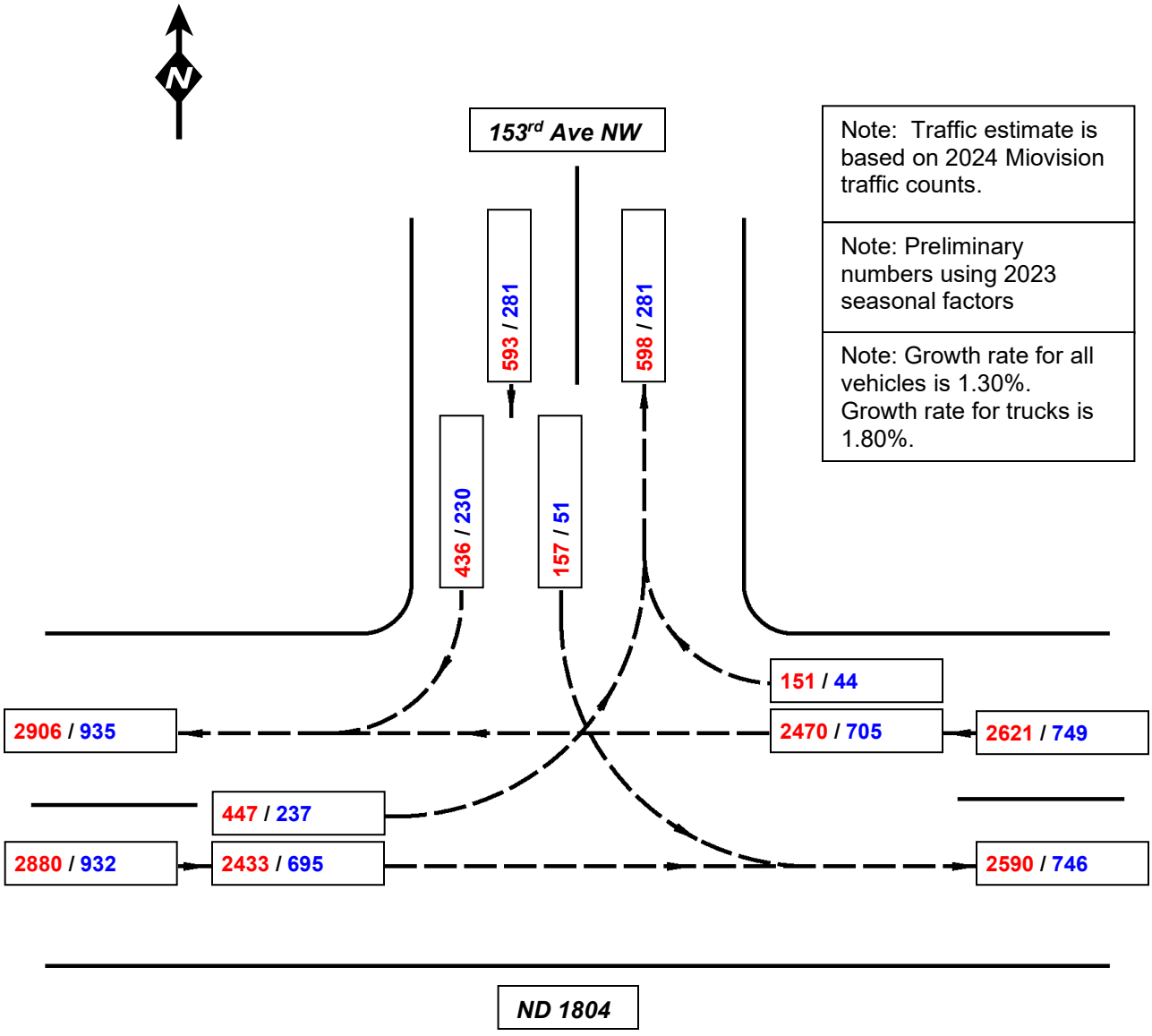
North Dakota Department of Transportation
SFN 7921 (Rev. 4-85)

Intersection No. 7

Description:
Int. ND 1804 & 153rd Ave NW
RP 340.00@0.57

Hours: 24

Date: 07/16/2024



Note: Traffic estimate is based on 2024 Miovision traffic counts.

Note: Preliminary numbers using 2023 seasonal factors

Note: Growth rate for all vehicles is 1.30%. Growth rate for trucks is 1.80%.

LEGEND: AADT / TRUCKS - 2044

Completed by NR

Intersection Traffic Volumes

North Dakota Department of Transportation
SFN 7921 (Rev. 4-85)

Intersection No: 8

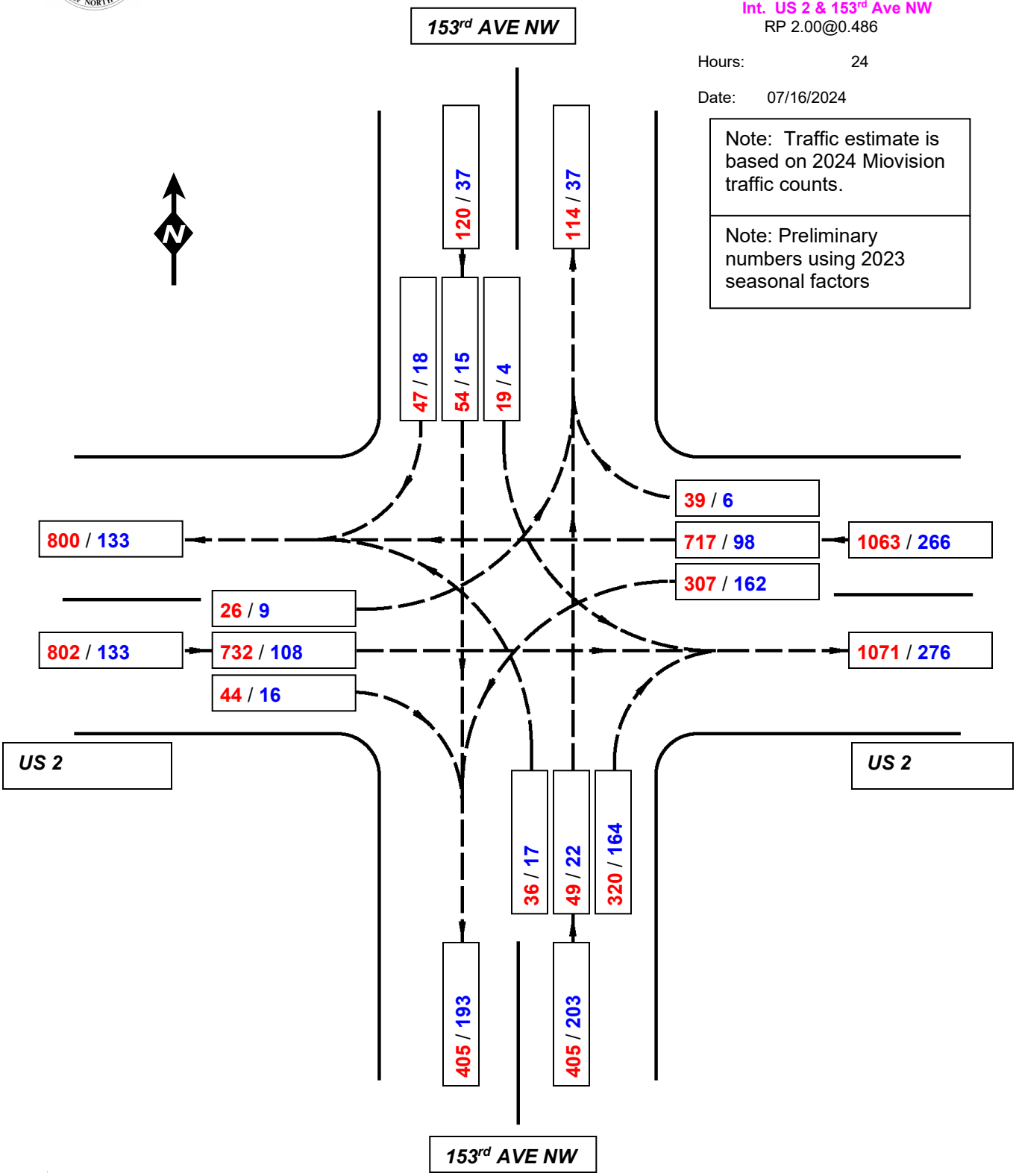
Description
Int. US 2 & 153rd Ave NW
RP 2.00@0.486

Hours: 24

Date: 07/16/2024

Note: Traffic estimate is based on 2024 Miovision traffic counts.

Note: Preliminary numbers using 2023 seasonal factors



LEGEND: AADT / TRUCKS - 2024

Completed by NR

Intersection Traffic Volumes

North Dakota Department of Transportation
SFN 7921 (Rev. 4-85)

Intersection No: 8

Description
Int. US 2 & 153rd Ave NW
RP 2.00@0.486

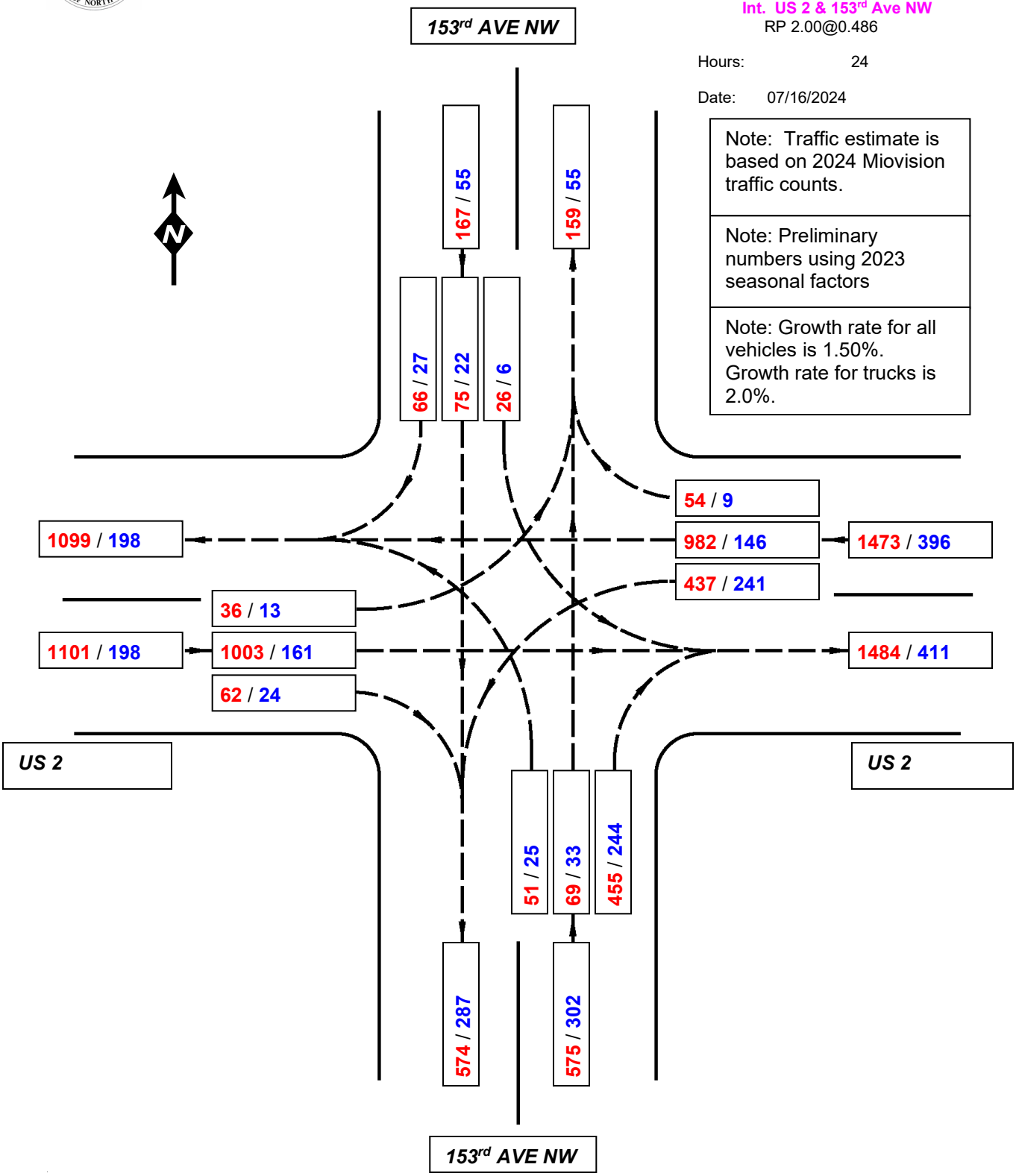
Hours: 24

Date: 07/16/2024

Note: Traffic estimate is based on 2024 Miovision traffic counts.

Note: Preliminary numbers using 2023 seasonal factors

Note: Growth rate for all vehicles is 1.50%. Growth rate for trucks is 2.0%.



LEGEND: AADT / TRUCKS - 2044

Completed by NR

ND 1804 & Casino Approach - NBL

Left turn lane

Traffic control device on approach

- [X] None (free flow)
- [ ] Traffic Signal
- [ ] Stop or Yield

Calculate Passenger Car Equivalent (PCE)

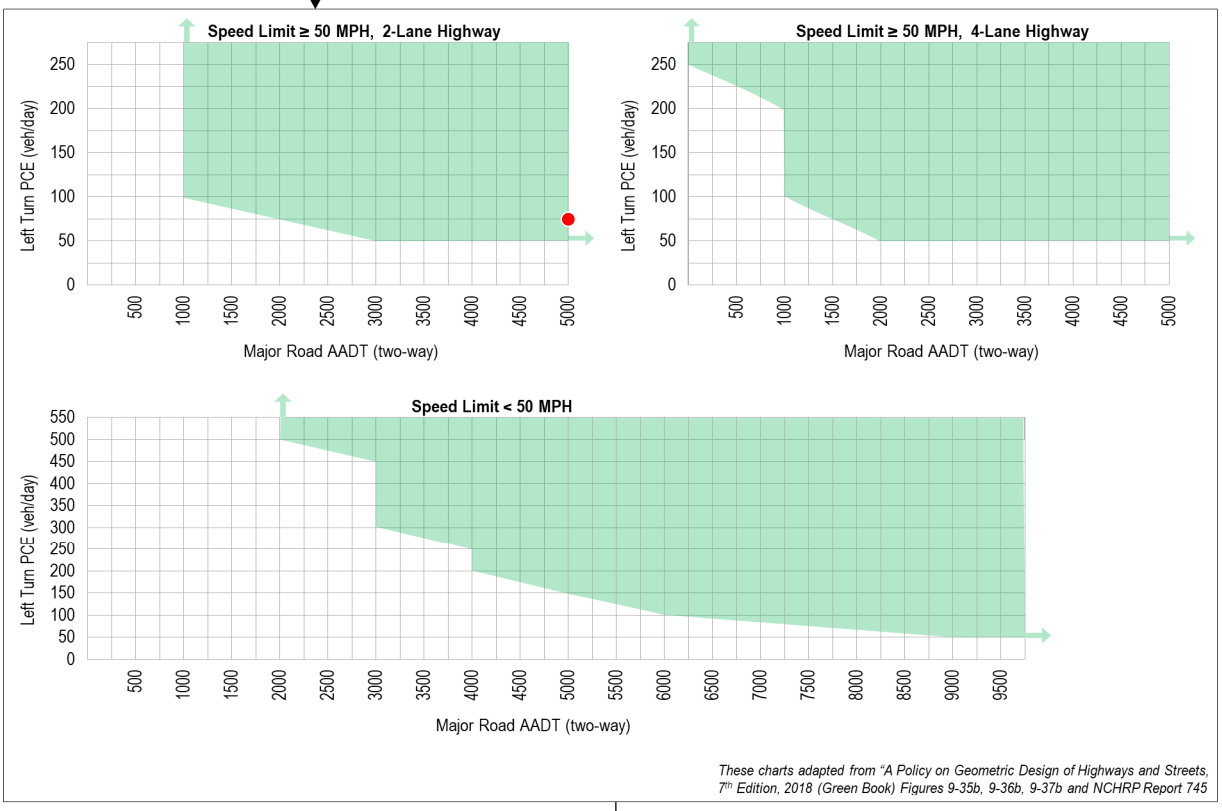
$PCE = V_{LT}(1+P_T(E_T-1))$

VLT=68. PT=0.088, ET=2
PCE=74
AADT=6001

Where:
V_{LT} = # of vehicles turning left per day (vpd)
P_T = percentage of trucks expressed as a decimal
E_T = 2.0 for level terrain (2.5% or less) or
E_T = 3.0 for rolling terrain (greater than 2.5%)
(E_T values based on "Highway Capacity Manual, 6th Edition, 2016, Exhibit 12-25)

Determine the major road AADT (two-way) volume—on highest volume approach—and plot on the appropriate chart below:

Left turn lane recommended*



These charts adapted from "A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018 (Green Book) Figures 9-35b, 9-36b, 9-37b and NCHRP Report 745

***New or reconstructed left turn lanes should have zero or positive offset, except where:**

- T-intersections (due to no opposing left turn vehicles)
- Unsignalized intersections with low opposing left turn volumes, less than 300 PCE each
- Signalized intersections with protected-only left turn phasing

- [ ] Plotted point falls within the white area

A left turn may be recommended based on engineering judgment:

- [ ] Has there been a crash susceptible to correction by a left turn lane within the last 5 years?
- [ ] Capacity analysis shows a need for a left turn lane?
- [ ] Left turn lane in place (or recommended) on the opposite approach?
- [ ] Other factors apply?

- [ ] Yes
- [ ] No

- [X] Plotted point falls within the green area

Left turn lane recommended*

Left turn lane not recommended

ND 1804 & Casino Approach - SBR

Right turn lane

Traffic control device on approach

☒ None (free flow) ☐ Stop or Yield ☐ Traffic Signal

Speed Limit ≥ 50 MPH?

☒ Yes ☐ No

A right turn may be recommended based on engineering judgment:

- ☐ Has there been a crash susceptible to correction by a right turn lane within the last 5 years?
- ☐ Capacity analysis shows a need for a right turn lane?
- ☐ Other factors apply?

Note that in urban areas with heavy pedestrian, bicycle, and/or transit activity, right turn lanes are **NOT** desired due to conflicts with other modes.

☒ Yes ☐ No

Right turn lane recommended*

Right turn lane not recommended

Calculate Passenger Car Equivalent (PCE)

$$PCE = V_{RT}(1+P_T(E_T-1))$$

VRT=443, PT=0.014, ET=2
PCE=449 AADT=6001

Where:
V_{RT} = # of vehicles turning right per day (vpd)
P_T = percentage of trucks expressed as a decimal
E_T = 2.0 for level terrain (2.5% or less) or
E_T = 3.0 for rolling terrain (greater than 2.5%)
(E_T values based on "Highway Capacity Manual", 6th Edition, 2016, Exhibit 12-25)

Determine the major road AADT (two-way) volume—on approach with analyzed right turns—and plot on the appropriate chart to the right:

***The study should indicate any need for *offset* right turn. Typical questions to determine appropriate locations for an offset right turn lane:**

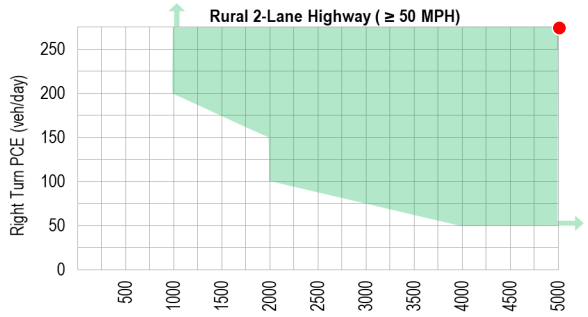
- Crash trends identified that are susceptible to correction by an offset right turn lane?
- Large volume of truck turning traffic?
- Sight distance issues?

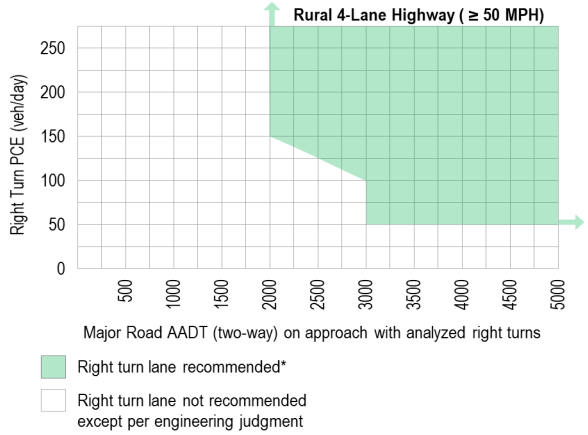
Signalized Intersections

If the number of right Turning Vehicles in a one-hour period is greater than the value shown below, then a right turn lane is recommended:

Speed Limit (mph)	Right turns (veh/hr)
20	300
25	300
30	250
35	200
40	150
45	100
50	50
55	50

From "Highway Capacity Manual", 6th Edition, 2016, Page 19-33





These charts adapted from "A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018 (Green Book) Figures 9-36a, 9-37a and NCHRP Report 745

ND 1804 & 147th Ave NW - NBL

Left turn lane

Traffic control device on approach

- [x] None (free flow)
- [ ] Traffic Signal
- [ ] Stop or Yield

Left turn lane recommended*

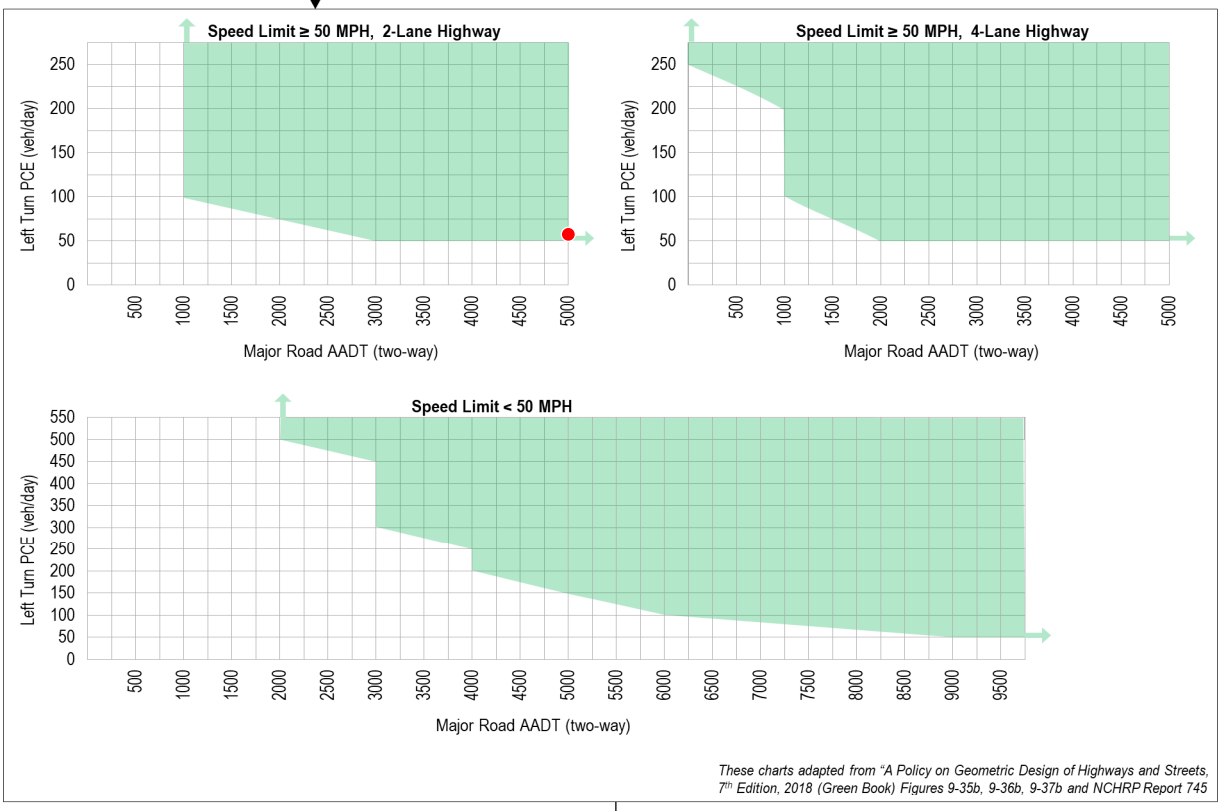
Calculate Passenger Car Equivalent (PCE)

PCE = $V_{LT}(1+P_T(E_T-1))$

VLT=53. PT=0.075, ET=2
PCE=57
AADT=5339

Where:
V_{LT} = # of vehicles turning left per day (vpd)
P_T = percentage of trucks expressed as a decimal
E_T = 2.0 for level terrain (2.5% or less) or
E_T = 3.0 for rolling terrain (greater than 2.5%)
(E_T values based on "Highway Capacity Manual, 6th Edition, 2016, Exhibit 12-25)

Determine the major road AADT (two-way) volume—on highest volume approach—and plot on the appropriate chart below:



These charts adapted from "A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018 (Green Book) Figures 9-35b, 9-36b, 9-37b and NCHRP Report 745

- [ ] Plotted point falls within the white area

A left turn may be recommended based on engineering judgment:

- [ ] Has there been a crash susceptible to correction by a left turn lane within the last 5 years?
- [ ] Capacity analysis shows a need for a left turn lane?
- [ ] Left turn lane in place (or recommended) on the opposite approach?
- [ ] Other factors apply?

- [ ] Yes
- [ ] No

- [x] Plotted point falls within the green area

Left turn lane recommended*

Left turn lane not recommended

***New or reconstructed left turn lanes should have zero or positive offset, except where:**

- T-intersections (due to no opposing left turn vehicles)
- Unsignalized intersections with low opposing left turn volumes, less than 300 PCE each
- Signalized intersections with protected-only left turn phasing

ND 1804 & 147th Ave NW - SBR

Right turn lane

Traffic control device on approach

☒ None (free flow) ☐ Stop or Yield ☐ Traffic Signal

Speed Limit ≥ 50 MPH?

☒ Yes ☐ No

A right turn may be recommended based on engineering judgment:

- ☐ Has there been a crash susceptible to correction by a right turn lane within the last 5 years?
- ☐ Capacity analysis shows a need for a right turn lane?
- ☐ Other factors apply?

Note that in urban areas with heavy pedestrian, bicycle, and/or transit activity, right turn lanes are **NOT** desired due to conflicts with other modes.

☐ Yes → **Right turn lane recommended***

☒ No → **Right turn lane not recommended**

Calculate Passenger Car Equivalent (PCE)

$$PCE = V_{RT}(1+P_T(E_T-1))$$

VRT=29, PT=0.172, ET=2
PCE=34 AADT=5339

Where:

V_{RT} = # of vehicles turning right per day (vpd)

P_T = percentage of trucks expressed as a decimal

E_T = 2.0 for level terrain (2.5% or less) or

E_T = 3.0 for rolling terrain (greater than 2.5%)

(E_T values based on "Highway Capacity Manual", 6th Edition, 2016, Exhibit 12-25)

Determine the major road AADT (two-way) volume—on approach with analyzed right turns—and plot on the appropriate chart to the right:

***The study should indicate any need for *offset* right turn. Typical questions to determine appropriate locations for an offset right turn lane:**

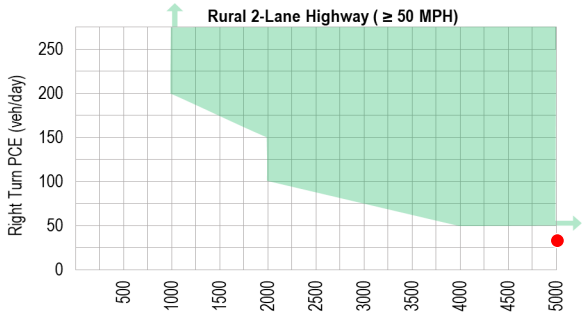
- Crash trends identified that are susceptible to correction by an offset right turn lane?
- Large volume of truck turning traffic?
- Sight distance issues?

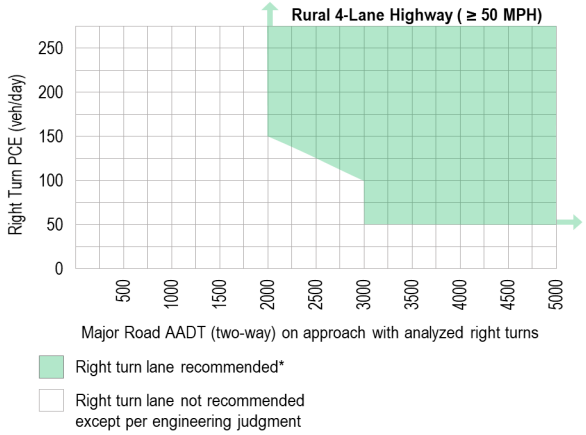
Signalized Intersections

If the number of right Turning Vehicles in a one-hour period is greater than the value shown below, then a right turn lane is recommended:

Speed Limit (mph)	Right turns (veh/hr)
20	300
25	300
30	250
35	200
40	150
45	100
50	50
55	50

From "Highway Capacity Manual", 6th Edition, 2016, Page 19-33





These charts adapted from "A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018 (Green Book) Figures 9-36a, 9-37a and NCHRP Report 745

ND 1804 & 44th Ln/147th Ave NW - NBL

Left turn lane

Traffic control device on approach

- [x] None (free flow)
- [ ] Traffic Signal
- [ ] Stop or Yield

Left turn lane recommended*

Calculate Passenger Car Equivalent (PCE)

$$PCE = V_{LT}(1+P_T(E_T-1))$$

Where:

V_{LT} = # of vehicles turning left per day (vpd)

P_T = percentage of trucks expressed as a decimal

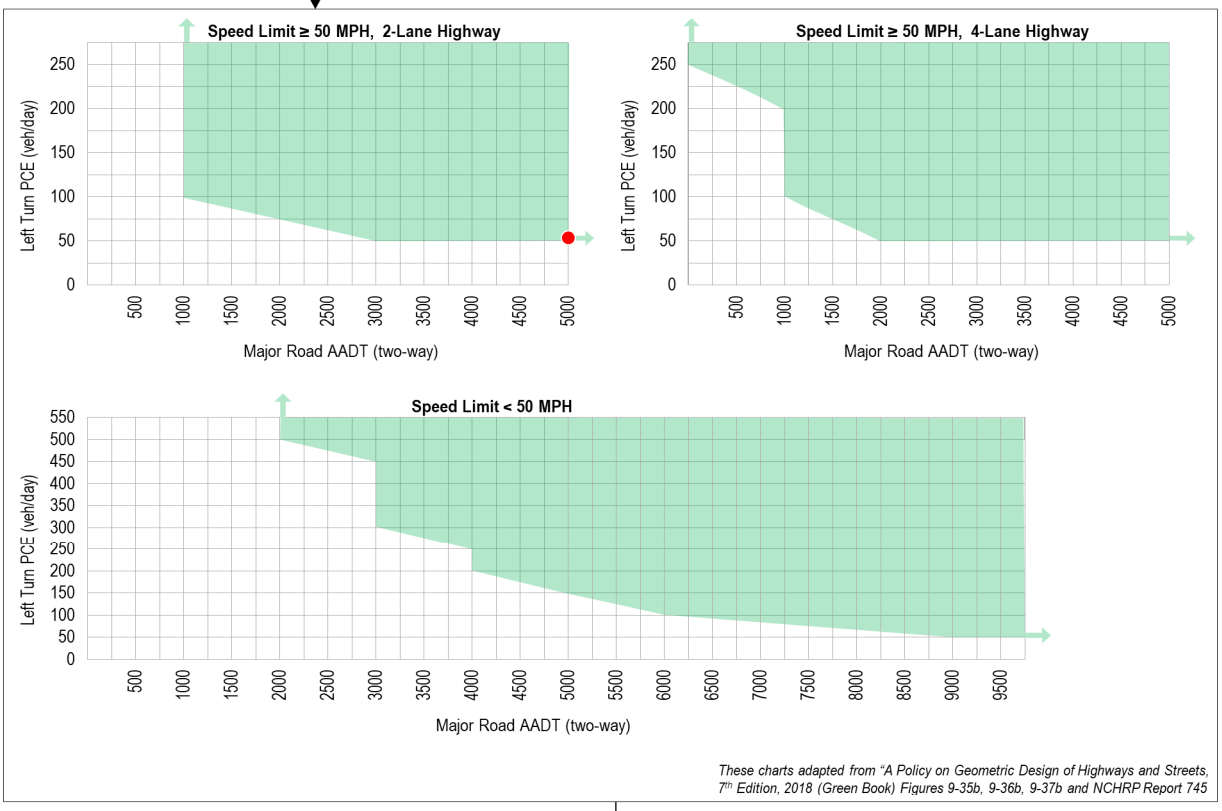
E_T = 2.0 for level terrain (2.5% or less) or

E_T = 3.0 for rolling terrain (greater than 2.5%)

(E_T values based on "Highway Capacity Manual, 6th Edition, 2016, Exhibit 12-25)

VLT=29. PT=0.828, ET=2
PCE=53
AADT=5339

Determine the major road AADT (two-way) volume—on highest volume approach—and plot on the appropriate chart below:



These charts adapted from "A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018 (Green Book) Figures 9-35b, 9-36b, 9-37b and NCHRP Report 745

***New or reconstructed left turn lanes should have zero or positive offset, except where:**

- T-intersections (due to no opposing left turn vehicles)
- Unsignalized intersections with low opposing left turn volumes, less than 300 PCE each
- Signalized intersections with protected-only left turn phasing

- [ ] Plotted point falls within the white area

A left turn may be recommended based on engineering judgment:

- [ ] Has there been a crash susceptible to correction by a left turn lane within the last 5 years?
- [ ] Capacity analysis shows a need for a left turn lane?
- [ ] Left turn lane in place (or recommended) on the opposite approach?
- [ ] Other factors apply?

- [ ] Yes
- [ ] No

- [x] Plotted point falls within the green area

Left turn lane recommended*

Left turn lane not recommended

ND 1804 & 44th Ln/147th Ave NW - NBR

Right turn lane

Traffic control device on approach

☒ None (free flow) ☐ Stop or Yield ☐ Traffic Signal

Speed Limit ≥ 50 MPH?

☒ Yes ☐ No

A right turn may be recommended based on engineering judgment:

- ☐ Has there been a crash susceptible to correction by a right turn lane within the last 5 years?
- ☐ Capacity analysis shows a need for a right turn lane?
- ☐ Other factors apply?

Note that in urban areas with heavy pedestrian, bicycle, and/or transit activity, right turn lanes are **NOT** desired due to conflicts with other modes.

☐ Yes ☒ No

Right turn lane recommended*

Right turn lane not recommended

Calculate Passenger Car Equivalent (PCE)

$$PCE = V_{RT}(1+P_T(E_T-1))$$

VRT=7, PT=0.429, ET=2
PCE=10 AADT=5339

Where:

V_{RT} = # of vehicles turning right per day (vpd)

P_T = percentage of trucks expressed as a decimal

E_T = 2.0 for level terrain (2.5% or less) or

E_T = 3.0 for rolling terrain (greater than 2.5%)

(E_T values based on "Highway Capacity Manual", 6th Edition, 2016, Exhibit 12-25)

Determine the major road AADT (two-way) volume—on approach with analyzed right turns—and plot on the appropriate chart to the right:

***The study should indicate any need for *offset* right turn. Typical questions to determine appropriate locations for an offset right turn lane:**

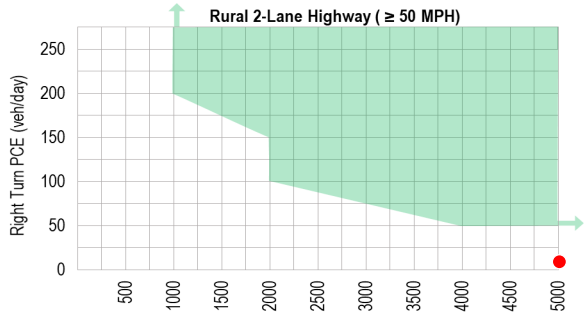
- Crash trends identified that are susceptible to correction by an offset right turn lane?
- Large volume of truck turning traffic?
- Sight distance issues?

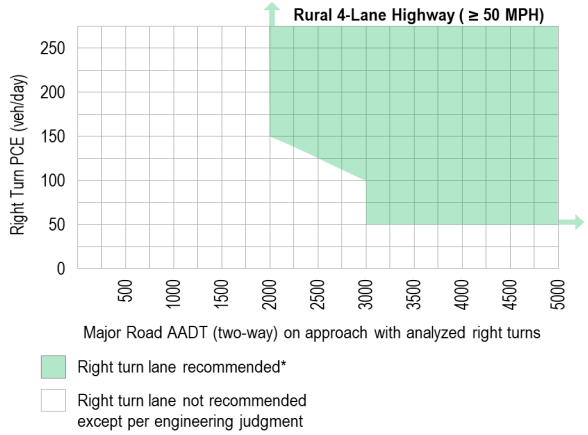
Signalized Intersections

If the number of right Turning Vehicles in a one-hour period is greater than the value shown below, then a right turn lane is recommended:

Speed Limit (mph)	Right turns (veh/hr)
20	300
25	300
30	250
35	200
40	150
45	100
50	50
55	50

From "Highway Capacity Manual", 6th Edition, 2016, Page 19-33





These charts adapted from "A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018 (Green Book) Figures 9-36a, 9-37a and NCHRP Report 745

ND 1804 & 44th Ln/147th Ave NW - SBL

Left turn lane

Traffic control device on approach

- [x] None (free flow)
- [ ] Traffic Signal
- [ ] Stop or Yield

Left turn lane recommended*

Calculate Passenger Car Equivalent (PCE)

$$PCE = V_{LT}(1+P_T(E_T-1))$$

Where:

V_{LT} = # of vehicles turning left per day (vpd)

P_T = percentage of trucks expressed as a decimal

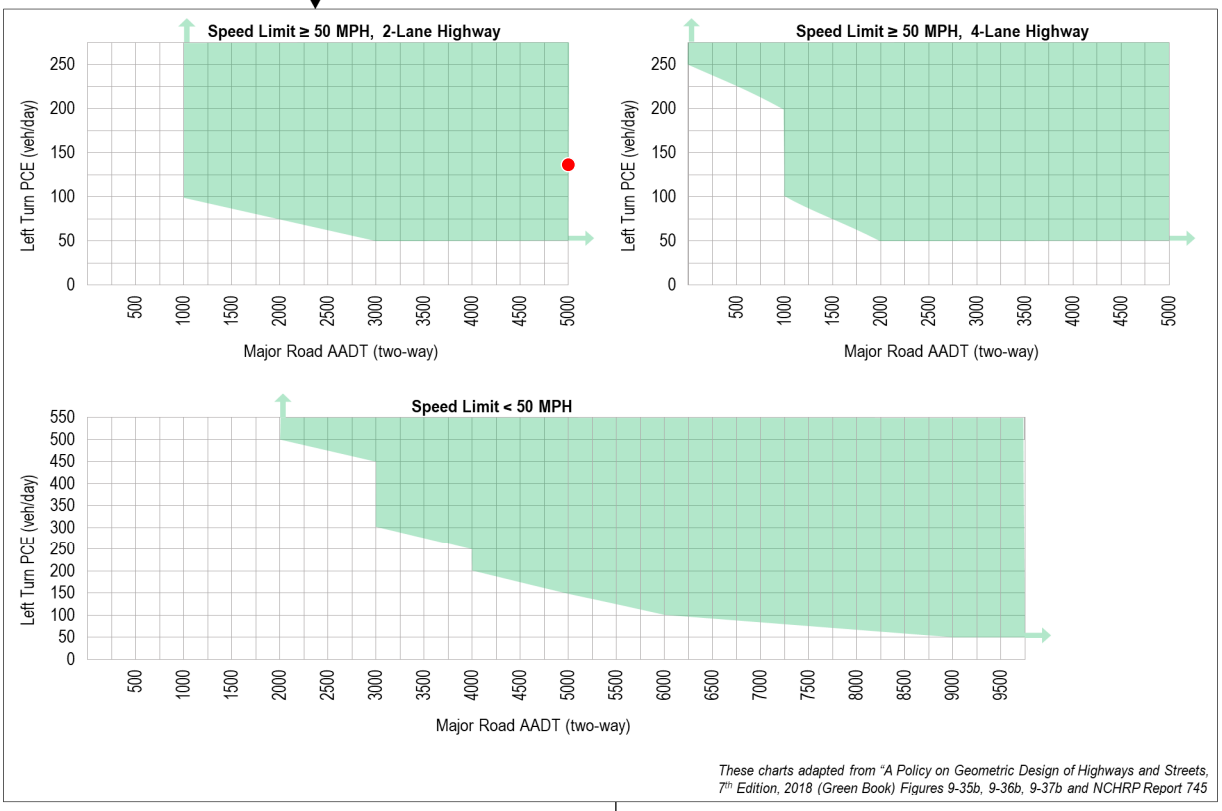
E_T = 2.0 for level terrain (2.5% or less) or

E_T = 3.0 for rolling terrain (greater than 2.5%)

(E_T values based on "Highway Capacity Manual, 6th Edition, 2016, Exhibit 12-25)

VLT=103. PT=0.32, ET=2
PCE=136
AADT=5339

Determine the major road AADT (two-way) volume—on highest volume approach—and plot on the appropriate chart below:



These charts adapted from "A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018 (Green Book) Figures 9-35b, 9-36b, 9-37b and NCHRP Report 745

***New or reconstructed left turn lanes should have zero or positive offset, except where:**

- T-intersections (due to no opposing left turn vehicles)
- Unsignalized intersections with low opposing left turn volumes, less than 300 PCE each
- Signalized intersections with protected-only left turn phasing

- [ ] Plotted point falls within the white area

A left turn may be recommended based on engineering judgment:

- [ ] Has there been a crash susceptible to correction by a left turn lane within the last 5 years?
- [ ] Capacity analysis shows a need for a left turn lane?
- [ ] Left turn lane in place (or recommended) on the opposite approach?
- [ ] Other factors apply?

- [ ] Yes
- [ ] No

- [x] Plotted point falls within the green area

Left turn lane recommended*

Left turn lane not recommended

ND 1804 & 44th Ln/147th Ave NW - SBR

Right turn lane

Traffic control device on approach

☒ None (free flow) ☐ Stop or Yield ☐ Traffic Signal

Speed Limit ≥ 50 MPH?

☒ Yes ☐ No

A right turn may be recommended based on engineering judgment:

- ☐ Has there been a crash susceptible to correction by a right turn lane within the last 5 years?
- ☐ Capacity analysis shows a need for a right turn lane?
- ☐ Other factors apply?

Note that in urban areas with heavy pedestrian, bicycle, and/or transit activity, right turn lanes are **NOT** desired due to conflicts with other modes.

☒ Yes ☐ No

Right turn lane recommended*

Right turn lane not recommended

Calculate Passenger Car Equivalent (PCE)

$$PCE = V_{RT}(1+P_T(E_T-1))$$

VRT=48, PT=0.083, ET=2
PCE=52 AADT=5339

Where:

V_{RT} = # of vehicles turning right per day (vpd)

P_T = percentage of trucks expressed as a decimal

E_T = 2.0 for level terrain (2.5% or less) or

E_T = 3.0 for rolling terrain (greater than 2.5%)

(E_T values based on "Highway Capacity Manual", 6th Edition, 2016, Exhibit 12-25)

Determine the major road AADT (two-way) volume—on approach with analyzed right turns—and plot on the appropriate chart to the right:

***The study should indicate any need for *offset* right turn. Typical questions to determine appropriate locations for an offset right turn lane:**

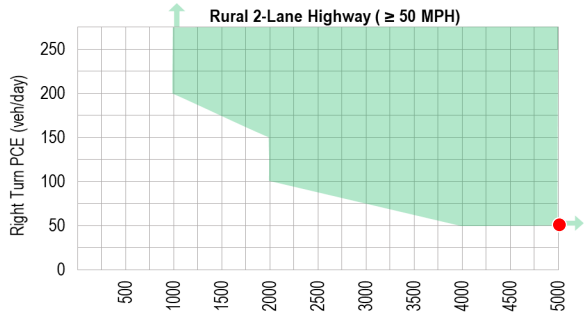
- Crash trends identified that are susceptible to correction by an offset right turn lane?
- Large volume of truck turning traffic?
- Sight distance issues?

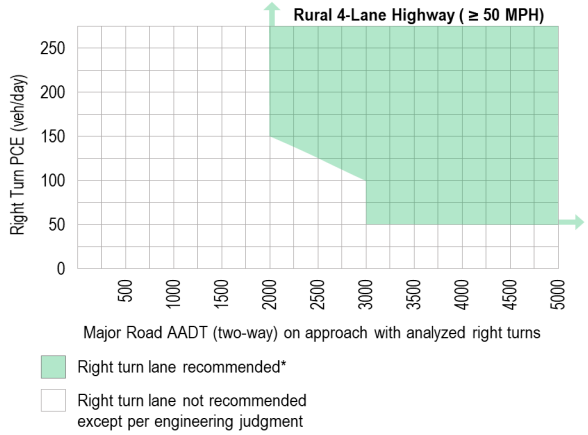
Signalized Intersections

If the number of right Turning Vehicles in a one-hour period is greater than the value shown below, then a right turn lane is recommended:

Speed Limit (mph)	Right turns (veh/hr)
20	300
25	300
30	250
35	200
40	150
45	100
50	50
55	50

From "Highway Capacity Manual", 6th Edition, 2016, Page 19-33





These charts adapted from "A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018 (Green Book) Figures 9-36a, 9-37a and NCHRP Report 745

ND 1804 & 42nd St/149th Ave - SBL

Left turn lane

Traffic control device on approach

- [x] None (free flow)
- [ ] Traffic Signal
- [ ] Stop or Yield

Calculate Passenger Car Equivalent (PCE)

$$PCE = V_{LT}(1+P_T(E_T-1))$$

Where:

V_{LT} = # of vehicles turning left per day (vpd)

P_T = percentage of trucks expressed as a decimal

E_T = 2.0 for level terrain (2.5% or less) or

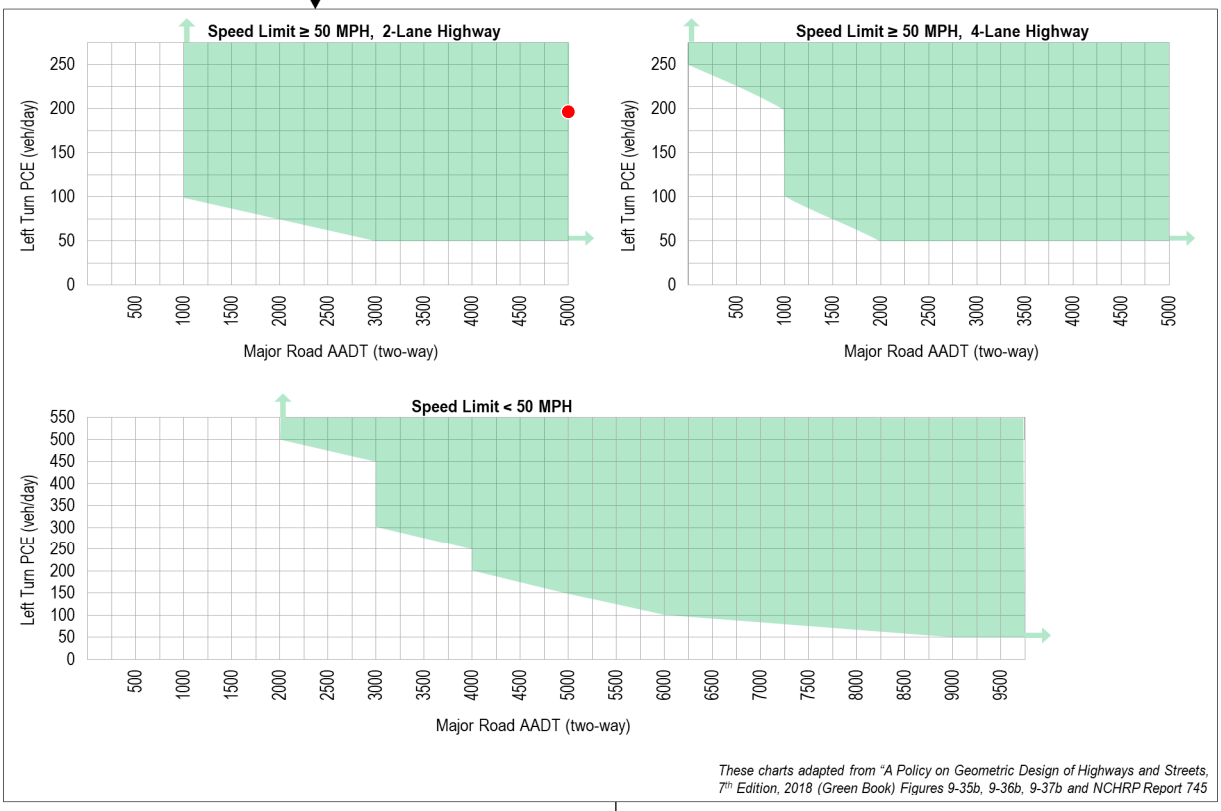
E_T = 3.0 for rolling terrain (greater than 2.5%)

(E_T values based on "Highway Capacity Manual, 6th Edition, 2016, Exhibit 12-25)

VLT=160. PT=0.225, ET=2
PCE=196
AADT=5209

Determine the major road AADT (two-way) volume—on highest volume approach—and plot on the appropriate chart below:

Left turn lane recommended*



These charts adapted from "A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018 (Green Book) Figures 9-35b, 9-36b, 9-37b and NCHRP Report 745

***New or reconstructed left turn lanes should have zero or positive offset, except where:**

- T-intersections (due to no opposing left turn vehicles)
- Unsignalized intersections with low opposing left turn volumes, less than 300 PCE each
- Signalized intersections with protected-only left turn phasing

- [ ] Plotted point falls within the white area

A left turn may be recommended based on engineering judgment:

- [ ] Has there been a crash susceptible to correction by a left turn lane within the last 5 years?
- [ ] Capacity analysis shows a need for a left turn lane?
- [ ] Left turn lane in place (or recommended) on the opposite approach?
- [ ] Other factors apply?

- [ ] Yes
- [ ] No

- [x] Plotted point falls within the green area

Left turn lane recommended*

Left turn lane not recommended

ND 1804 & 42nd St/149th Ave - NBR

Right turn lane

Traffic control device on approach

☒ None (free flow) ☐ Stop or Yield ☐ Traffic Signal

Speed Limit ≥ 50 MPH?

☒ Yes ☐ No

A right turn may be recommended based on engineering judgment:

- ☐ Has there been a crash susceptible to correction by a right turn lane within the last 5 years?
- ☐ Capacity analysis shows a need for a right turn lane?
- ☐ Other factors apply?

Note that in urban areas with heavy pedestrian, bicycle, and/or transit activity, right turn lanes are **NOT** desired due to conflicts with other modes.

☒ Yes ☐ No

Right turn lane recommended*

Right turn lane not recommended

Calculate Passenger Car Equivalent (PCE)

$$PCE = V_{RT}(1+P_T(E_T-1))$$

VRT=251, PT=0.733, ET=2
PCE=435 AADT=5209

Where:

V_{RT} = # of vehicles turning right per day (vpd)

P_T = percentage of trucks expressed as a decimal

E_T = 2.0 for level terrain (2.5% or less) or

E_T = 3.0 for rolling terrain (greater than 2.5%)

(E_T values based on "Highway Capacity Manual", 6th Edition, 2016, Exhibit 12-25)

Determine the major road AADT (two-way) volume—on approach with analyzed right turns—and plot on the appropriate chart to the right:

***The study should indicate any need for *offset* right turn. Typical questions to determine appropriate locations for an offset right turn lane:**

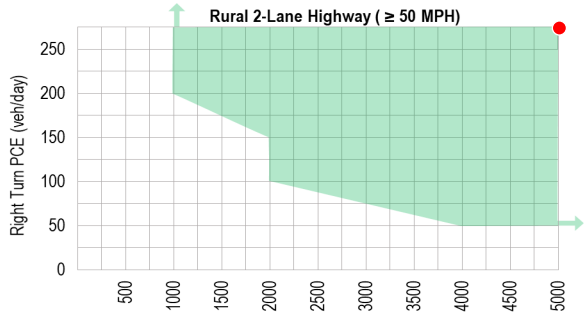
- Crash trends identified that are susceptible to correction by an offset right turn lane?
- Large volume of truck turning traffic?
- Sight distance issues?

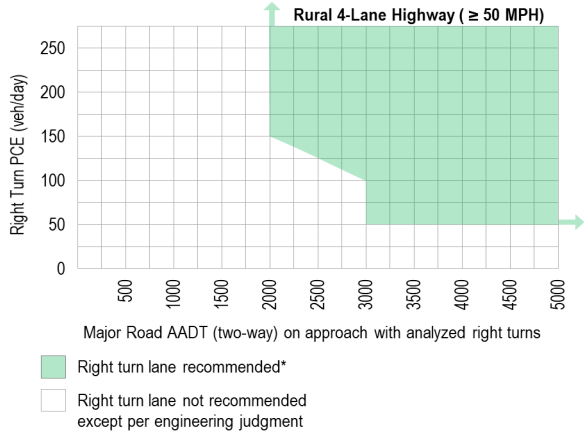
Signalized Intersections

If the number of right Turning Vehicles in a one-hour period is greater than the value shown below, then a right turn lane is recommended:

Speed Limit (mph)	Right turns (veh/hr)
20	300
25	300
30	250
35	200
40	150
45	100
50	50
55	50

From "Highway Capacity Manual", 6th Edition, 2016, Page 19-33





These charts adapted from "A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018 (Green Book) Figures 9-36a, 9-37a and NCHRP Report 745

ND 1804 & 145th Rd (south) - NBL

Left turn lane

Traffic control device on approach

- [x] None (free flow)
- [ ] Traffic Signal
- [ ] Stop or Yield

Calculate Passenger Car Equivalent (PCE)

$PCE = V_{LT}(1+P_T(E_T-1))$

Where:

V_{LT} = # of vehicles turning left per day (vpd)

P_T = percentage of trucks expressed as a decimal

E_T = 2.0 for level terrain (2.5% or less) or

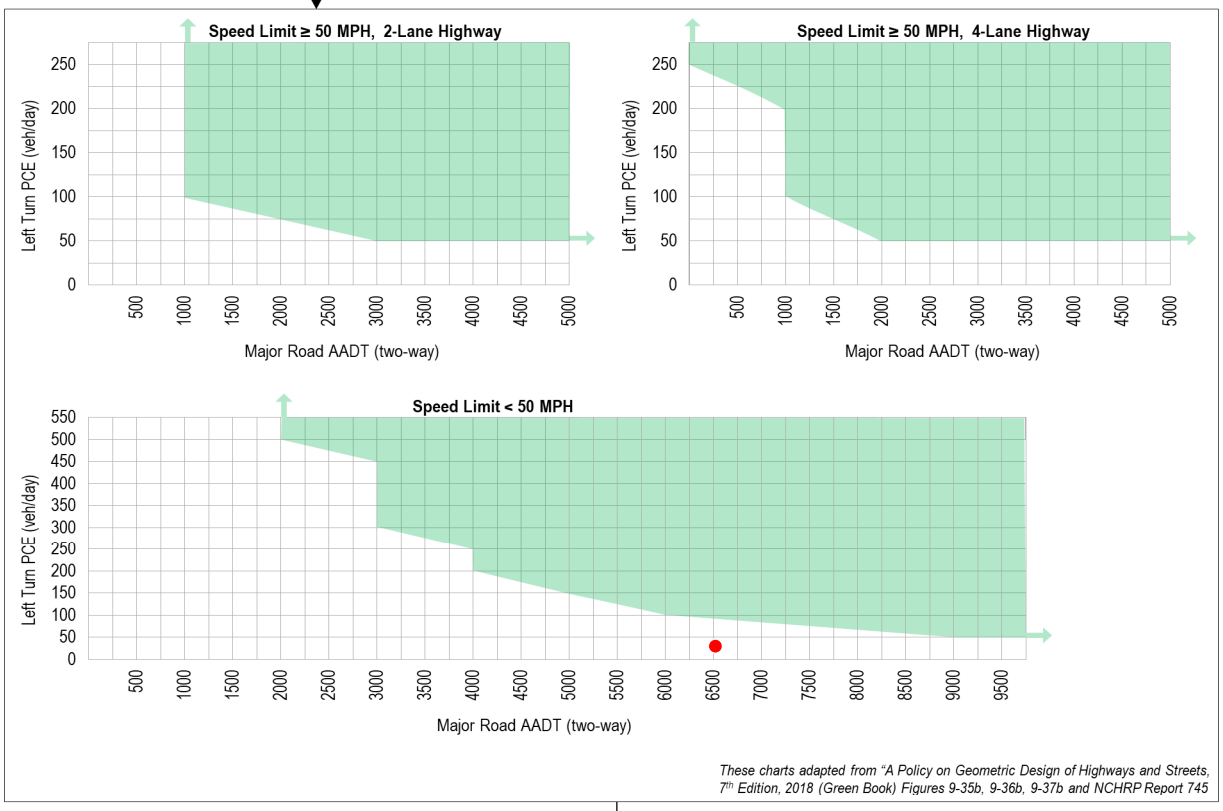
E_T = 3.0 for rolling terrain (greater than 2.5%)

(E_T values based on "Highway Capacity Manual, 6th Edition, 2016, Exhibit 12-25)

VLT=29. PT=0.103, ET=2
PCE=32
AADT=6519

Determine the major road AADT (two-way) volume—on highest volume approach—and plot on the appropriate chart below:

Left turn lane recommended*



These charts adapted from "A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018 (Green Book) Figures 9-35b, 9-36b, 9-37b and NCHRP Report 745

***New or reconstructed left turn lanes should have zero or positive offset, except where:**

- T-intersections (due to no opposing left turn vehicles)
- Unsignalized intersections with low opposing left turn volumes, less than 300 PCE each
- Signalized intersections with protected-only left turn phasing

Plotted point falls within the white area

A left turn may be recommended based on engineering judgment:

- [ ] Has there been a crash susceptible to correction by a left turn lane within the last 5 years?
- [ ] Capacity analysis shows a need for a left turn lane?
- [x] Left turn lane in place (or recommended) on the opposite approach?
- [ ] Other factors apply?

- [x] Yes
- [ ] No

Plotted point falls within the green area

Left turn lane recommended*

Left turn lane not recommended

ND 1804 & 145th Rd (south) - NBR

Right turn lane

Traffic control device on approach

☒ None (free flow) ☐ Stop or Yield ☐ Traffic Signal

Speed Limit ≥ 50 MPH?

☐ Yes ☒ No

A right turn may be recommended based on engineering judgment:

- ☐ Has there been a crash susceptible to correction by a right turn lane within the last 5 years?
- ☐ Capacity analysis shows a need for a right turn lane?
- ☐ Other factors apply?

Note that in urban areas with heavy pedestrian, bicycle, and/or transit activity, right turn lanes are **NOT** desired due to conflicts with other modes.

☐ Yes ☒ No

Right turn lane recommended*

Right turn lane not recommended

Calculate Passenger Car Equivalent (PCE)

$$PCE = V_{RT}(1+P_T(E_T-1))$$

VRT=101, PT=0.059, ET=2
PCE=107 AADT=6519

Where:

V_{RT} = # of vehicles turning right per day (vpd)

P_T = percentage of trucks expressed as a decimal

E_T = 2.0 for level terrain (2.5% or less) or

E_T = 3.0 for rolling terrain (greater than 2.5%)

(E_T values based on "Highway Capacity Manual", 6th Edition, 2016, Exhibit 12-25)

Determine the major road AADT (two-way) volume—on approach with analyzed right turns—and plot on the appropriate chart to the right:

***The study should indicate any need for *offset* right turn. Typical questions to determine appropriate locations for an offset right turn lane:**

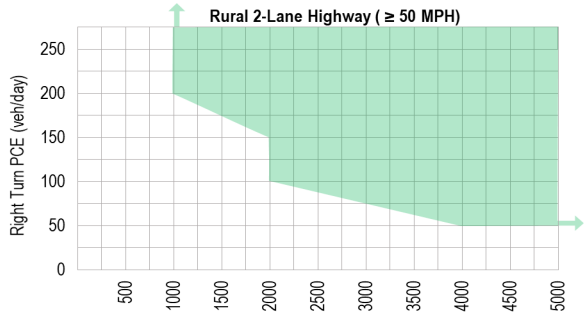
- Crash trends identified that are susceptible to correction by an offset right turn lane?
- Large volume of truck turning traffic?
- Sight distance issues?

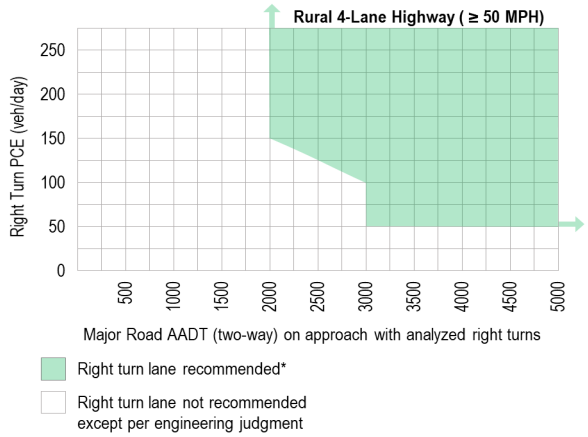
Signalized Intersections

If the number of right Turning Vehicles in a one-hour period is greater than the value shown below, then a right turn lane is recommended:

Speed Limit (mph)	Right turns (veh/hr)
20	300
25	300
30	250
35	200
40	150
45	100
50	50
55	50

From "Highway Capacity Manual", 6th Edition, 2016, Page 19-33





These charts adapted from "A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018 (Green Book) Figures 9-36a, 9-37a and NCHRP Report 745

ND 1804 & 145th Rd (south) - SBL

Left turn lane

Traffic control device on approach

- [x] None (free flow)
- [ ] Traffic Signal
- [ ] Stop or Yield

Left turn lane recommended*

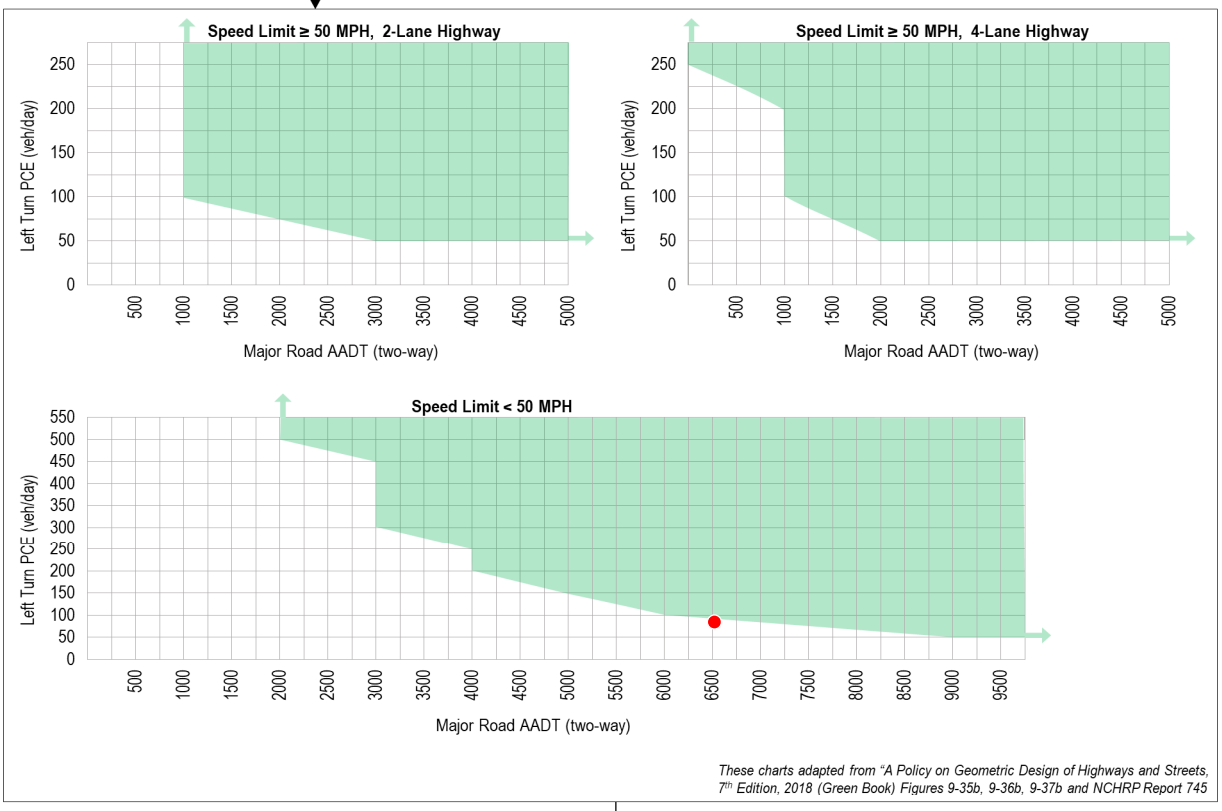
Calculate Passenger Car Equivalent (PCE)

PCE = $V_{LT}(1+P_T(E_T-1))$

VLT=84. PT=0.036, ET=2
PCE=87
AADT=6519

Where:
V_{LT} = # of vehicles turning left per day (vpd)
P_T = percentage of trucks expressed as a decimal
E_T = 2.0 for level terrain (2.5% or less) or
E_T = 3.0 for rolling terrain (greater than 2.5%)
(E_T values based on "Highway Capacity Manual, 6th Edition, 2016, Exhibit 12-25)

Determine the major road AADT (two-way) volume—on highest volume approach—and plot on the appropriate chart below:



These charts adapted from "A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018 (Green Book) Figures 9-35b, 9-36b, 9-37b and NCHRP Report 745

- [x] Plotted point falls within the white area

A left turn may be recommended based on engineering judgment:

- [ ] Has there been a crash susceptible to correction by a left turn lane within the last 5 years?
- [ ] Capacity analysis shows a need for a left turn lane?
- [ ] Left turn lane in place (or recommended) on the opposite approach?
- [ ] Other factors apply?

- [ ] Yes
- [x] No

- [ ] Plotted point falls within the green area

Left turn lane recommended*

Left turn lane not recommended

***New or reconstructed left turn lanes should have zero or positive offset, except where:**

- T-intersections (due to no opposing left turn vehicles)
- Unsignalized intersections with low opposing left turn volumes, less than 300 PCE each
- Signalized intersections with protected-only left turn phasing

ND 1804 & 145th Rd (south) - SBR

Right turn lane

Traffic control device on approach

☒ None (free flow) ☐ Stop or Yield ☐ Traffic Signal

Speed Limit ≥ 50 MPH?

☐ Yes ☒ No

A right turn may be recommended based on engineering judgment:

- ☐ Has there been a crash susceptible to correction by a right turn lane within the last 5 years?
- ☐ Capacity analysis shows a need for a right turn lane?
- ☐ Other factors apply?

Note that in urban areas with heavy pedestrian, bicycle, and/or transit activity, right turn lanes are **NOT** desired due to conflicts with other modes.

☐ Yes ☒ No

Right turn lane recommended*

Right turn lane not recommended

Calculate Passenger Car Equivalent (PCE)

$$PCE = V_{RT}(1+P_T(E_T-1))$$

VRT=40, PT=0.075, ET=2
PCE=43 AADT=6519

Where:

V_{RT} = # of vehicles turning right per day (vpd)

P_T = percentage of trucks expressed as a decimal

E_T = 2.0 for level terrain (2.5% or less) or

E_T = 3.0 for rolling terrain (greater than 2.5%)

(E_T values based on "Highway Capacity Manual", 6th Edition, 2016, Exhibit 12-25)

Determine the major road AADT (two-way) volume—on approach with analyzed right turns—and plot on the appropriate chart to the right:

***The study should indicate any need for *offset* right turn. Typical questions to determine appropriate locations for an offset right turn lane:**

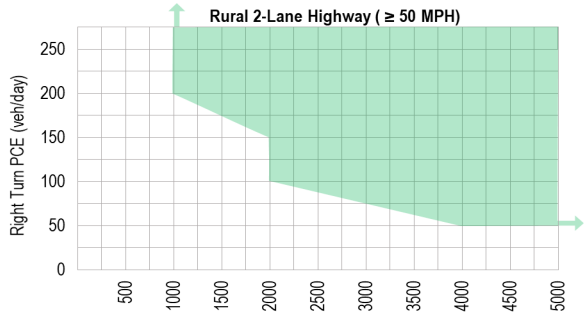
- Crash trends identified that are susceptible to correction by an offset right turn lane?
- Large volume of truck turning traffic?
- Sight distance issues?

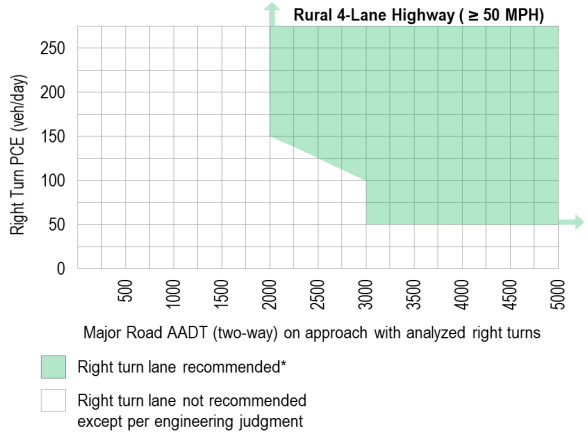
Signalized Intersections

If the number of right Turning Vehicles in a one-hour period is greater than the value shown below, then a right turn lane is recommended:

Speed Limit (mph)	Right turns (veh/hr)
20	300
25	300
30	250
35	200
40	150
45	100
50	50
55	50

From "Highway Capacity Manual", 6th Edition, 2016, Page 19-33





These charts adapted from "A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018 (Green Book) Figures 9-36a, 9-37a and NCHRP Report 745

ND 1804 & 145th Dr (north) - NBL

Left turn lane

Traffic control device on approach

- [x] None (free flow)
- [ ] Traffic Signal
- [ ] Stop or Yield

Left turn lane recommended*

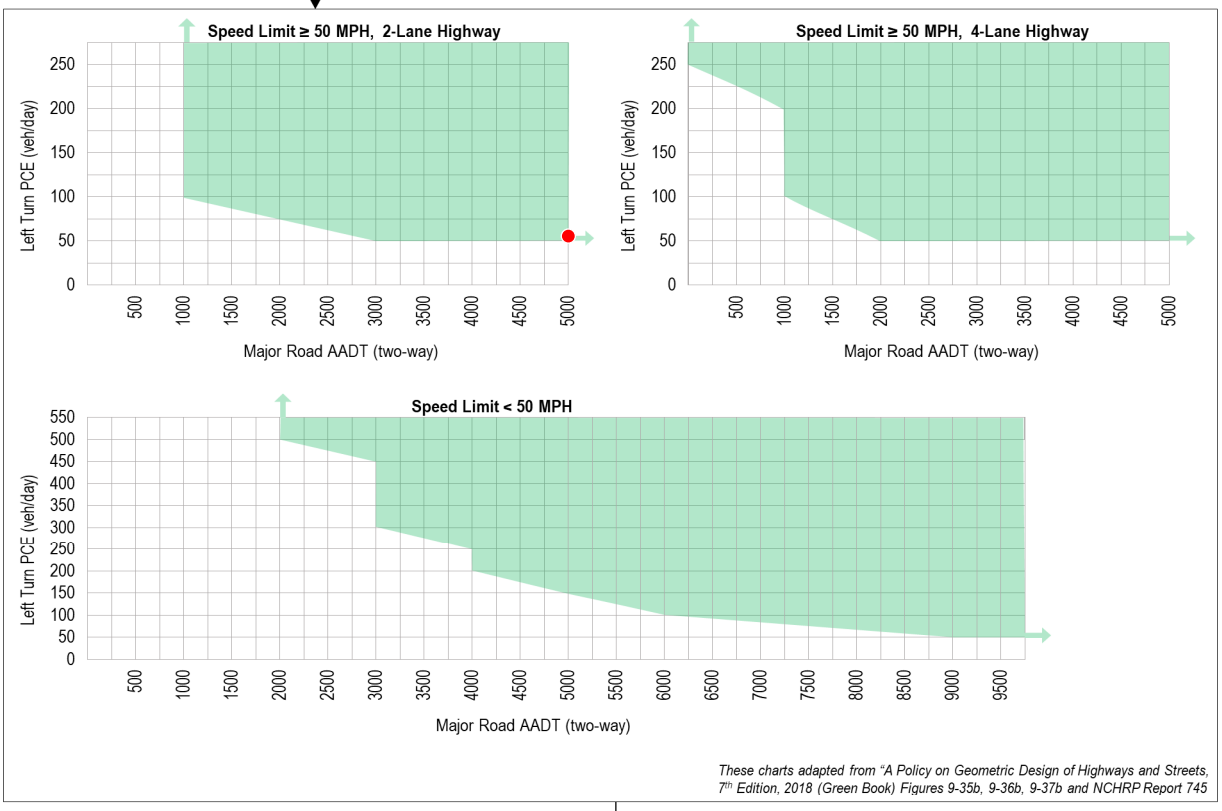
Calculate Passenger Car Equivalent (PCE)

PCE = $V_{LT}(1+P_T(E_T-1))$

VLT=55. PT=0, ET=2
PCE=55
AADT=6613

Where:
V_{LT} = # of vehicles turning left per day (vpd)
P_T = percentage of trucks expressed as a decimal
E_T = 2.0 for level terrain (2.5% or less) or
E_T = 3.0 for rolling terrain (greater than 2.5%)
(E_T values based on "Highway Capacity Manual, 6th Edition, 2016, Exhibit 12-25)

Determine the major road AADT (two-way) volume—on highest volume approach—and plot on the appropriate chart below:



These charts adapted from "A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018 (Green Book) Figures 9-35b, 9-36b, 9-37b and NCHRP Report 745

- [ ] Plotted point falls within the white area

A left turn may be recommended based on engineering judgment:

- [ ] Has there been a crash susceptible to correction by a left turn lane within the last 5 years?
- [ ] Capacity analysis shows a need for a left turn lane?
- [ ] Left turn lane in place (or recommended) on the opposite approach?
- [ ] Other factors apply?

- [ ] Yes
- [ ] No

- [x] Plotted point falls within the green area

Left turn lane recommended*

Left turn lane not recommended

***New or reconstructed left turn lanes should have zero or positive offset, except where:**

- T-intersections (due to no opposing left turn vehicles)
- Unsignalized intersections with low opposing left turn volumes, less than 300 PCE each
- Signalized intersections with protected-only left turn phasing

ND 1804 & 145th Dr (north) - SBR

Right turn lane

Traffic control device on approach

☒ None (free flow) ☐ Stop or Yield ☐ Traffic Signal

Speed Limit ≥ 50 MPH?

☒ Yes ☐ No

A right turn may be recommended based on engineering judgment:

- ☐ Has there been a crash susceptible to correction by a right turn lane within the last 5 years?
- ☐ Capacity analysis shows a need for a right turn lane?
- ☐ Other factors apply?

Note that in urban areas with heavy pedestrian, bicycle, and/or transit activity, right turn lanes are **NOT** desired due to conflicts with other modes.

☐ Yes ☒ No

Right turn lane recommended*

Right turn lane not recommended

Calculate Passenger Car Equivalent (PCE)

$$PCE = V_{RT}(1+P_T(E_T-1))$$

VRT=35, PT=0.029, ET=2
PCE=36 AADT=6613

Where:

V_{RT} = # of vehicles turning right per day (vpd)

P_T = percentage of trucks expressed as a decimal

E_T = 2.0 for level terrain (2.5% or less) or

E_T = 3.0 for rolling terrain (greater than 2.5%)

(E_T values based on "Highway Capacity Manual", 6th Edition, 2016, Exhibit 12-25)

Determine the major road AADT (two-way) volume—on approach with analyzed right turns—and plot on the appropriate chart to the right:

***The study should indicate any need for *offset* right turn. Typical questions to determine appropriate locations for an offset right turn lane:**

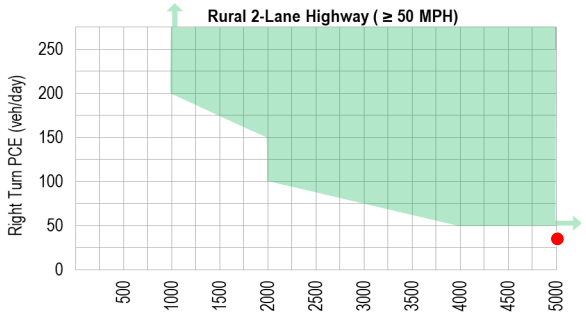
- Crash trends identified that are susceptible to correction by an offset right turn lane?
- Large volume of truck turning traffic?
- Sight distance issues?

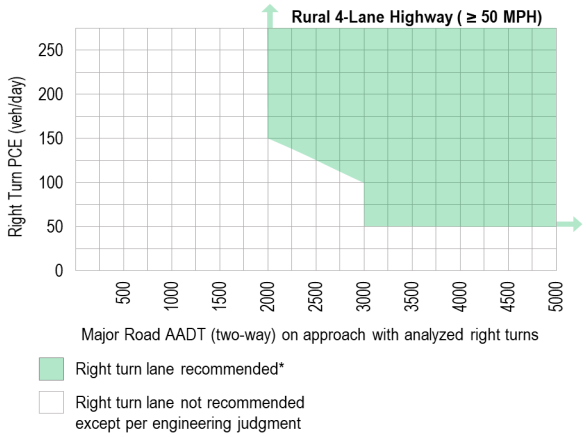
Signalized Intersections

If the number of right Turning Vehicles in a one-hour period is greater than the value shown below, then a right turn lane is recommended:

Speed Limit (mph)	Right turns (veh/hr)
20	300
25	300
30	250
35	200
40	150
45	100
50	50
55	50

From "Highway Capacity Manual", 6th Edition, 2016, Page 19-33





These charts adapted from "A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018 (Green Book) Figures 9-36a, 9-37a and NCHRP Report 745

ND 1804 & Co Rd 5 (153th Ave NW) - EBL

Left turn lane

Traffic control device on approach

☒ None (free flow) ☐ Traffic Signal ☐ Stop or Yield

Left turn lane recommended*

Calculate Passenger Car Equivalent (PCE)

$$PCE = V_{LT}(1+P_T(E_T-1))$$

Where:

V_{LT} = # of vehicles turning left per day (vpd)

P_T = percentage of trucks expressed as a decimal

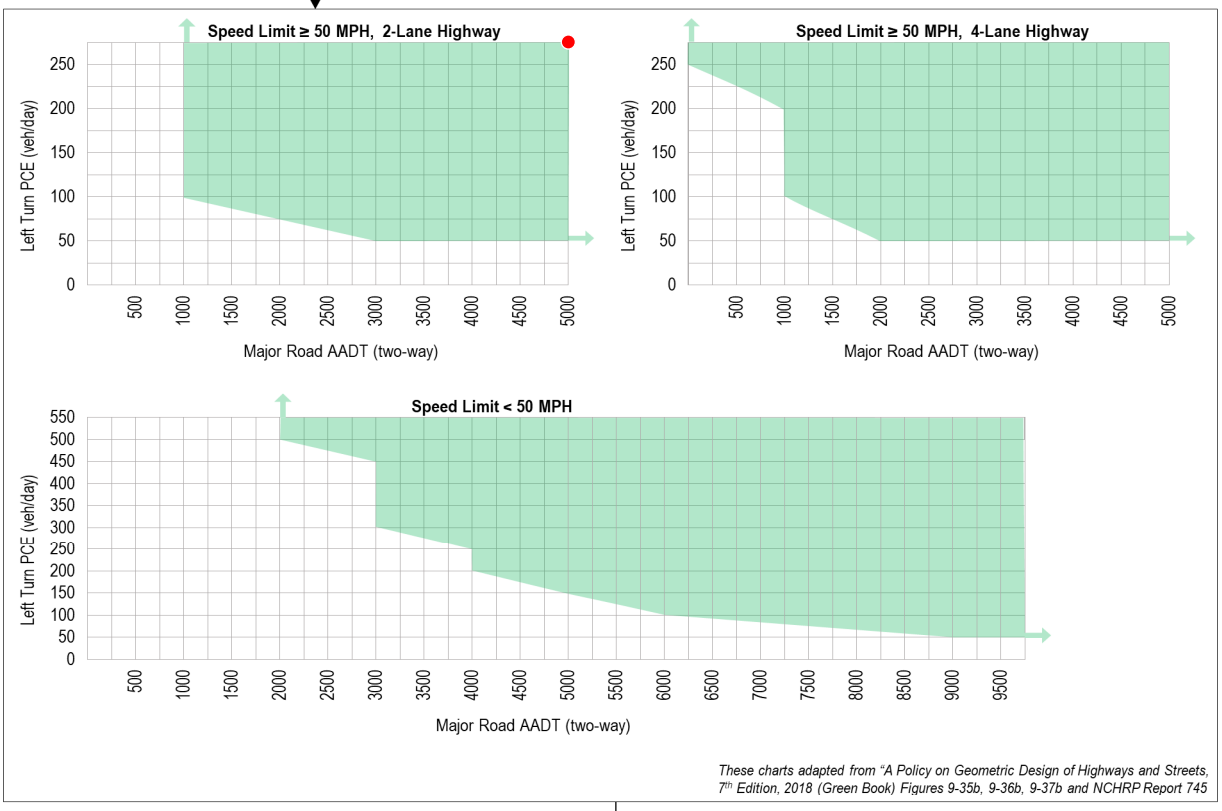
E_T = 2.0 for level terrain (2.5% or less) or

E_T = 3.0 for rolling terrain (greater than 2.5%)

(E_T values based on "Highway Capacity Manual, 6th Edition, 2016, Exhibit 12-25)

VLT=447. PT=0.53, ET=2
PCE=684
AADT=5786

Determine the major road AADT (two-way) volume—on highest volume approach—and plot on the appropriate chart below:



These charts adapted from "A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018 (Green Book) Figures 9-35b, 9-36b, 9-37b and NCHRP Report 745

***New or reconstructed left turn lanes should have zero or positive offset, except where:**

- T-intersections (due to no opposing left turn vehicles)
- Unsignalized intersections with low opposing left turn volumes, less than 300 PCE each
- Signalized intersections with protected-only left turn phasing

☐ Plotted point falls within the white area

A left turn may be recommended based on engineering judgment:

- ☐ Has there been a crash susceptible to correction by a left turn lane within the last 5 years?
- ☐ Capacity analysis shows a need for a left turn lane?
- ☐ Left turn lane in place (or recommended) on the opposite approach?
- ☐ Other factors apply?

☐ Yes ☐ No

☒ Plotted point falls within the green area

Left turn lane recommended*

Left turn lane not recommended

ND 1804 & Co Rd 5 (153th Ave NW) - WBR

Right turn lane

Traffic control device on approach

☒ None (free flow) ☐ Stop or Yield ☐ Traffic Signal

Speed Limit ≥ 50 MPH?

☒ Yes ☐ No

A right turn may be recommended based on engineering judgment:

- ☐ Has there been a crash susceptible to correction by a right turn lane within the last 5 years?
- ☐ Capacity analysis shows a need for a right turn lane?
- ☐ Other factors apply?

Note that in urban areas with heavy pedestrian, bicycle, and/or transit activity, right turn lanes are **NOT** desired due to conflicts with other modes.

☒ Yes ☐ No

Right turn lane recommended*

Right turn lane not recommended

Calculate Passenger Car Equivalent (PCE)

$$PCE = V_{RT}(1+P_T(E_T-1))$$

VRT=151, PT=0.291, ET=2
PCE=195 AADT=5786

Where:

V_{RT} = # of vehicles turning right per day (vpd)

P_T = percentage of trucks expressed as a decimal

E_T = 2.0 for level terrain (2.5% or less) or

E_T = 3.0 for rolling terrain (greater than 2.5%)

(E_T values based on "Highway Capacity Manual", 6th Edition, 2016, Exhibit 12-25)

Determine the major road AADT (two-way) volume—on approach with analyzed right turns—and plot on the appropriate chart to the right:

***The study should indicate any need for *offset* right turn. Typical questions to determine appropriate locations for an offset right turn lane:**

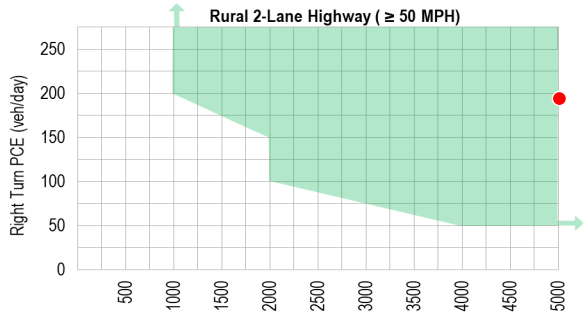
- Crash trends identified that are susceptible to correction by an offset right turn lane?
- Large volume of truck turning traffic?
- Sight distance issues?

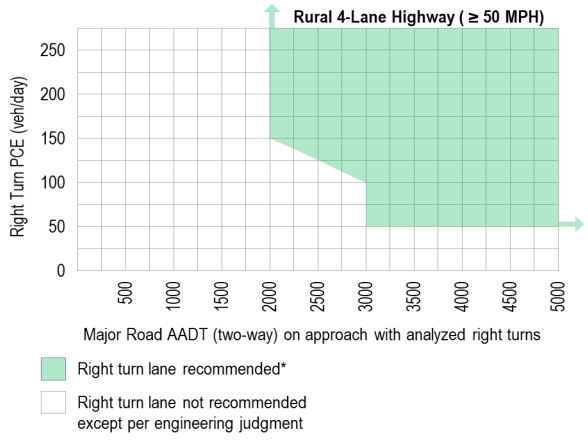
Signalized Intersections

If the number of right Turning Vehicles in a one-hour period is greater than the value shown below, then a right turn lane is recommended:

Speed Limit (mph)	Right turns (veh/hr)
20	300
25	300
30	250
35	200
40	150
45	100
50	50
55	50

From "Highway Capacity Manual", 6th Edition, 2016, Page 19-33





Right turn lane recommended*

Right turn lane not recommended except per engineering judgment

These charts adapted from "A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018 (Green Book) Figures 9-36a, 9-37a and NCHRP Report 745

US 2 & Co Rd 5 (153th Ave NW) - WBR

Right turn lane

Traffic control device on approach

☒ None (free flow) ☐ Stop or Yield ☐ Traffic Signal

Speed Limit ≥ 50 MPH?

☒ Yes ☐ No

A right turn may be recommended based on engineering judgment:

- ☐ Has there been a crash susceptible to correction by a right turn lane within the last 5 years?
- ☐ Capacity analysis shows a need for a right turn lane?
- ☐ Other factors apply?

Note that in urban areas with heavy pedestrian, bicycle, and/or transit activity, right turn lanes are **NOT** desired due to conflicts with other modes.

☐ Yes ☒ No

Right turn lane recommended*

Right turn lane not recommended

Calculate Passenger Car Equivalent (PCE)

$$PCE = V_{RT}(1+P_T(E_T-1))$$

VRT=54, PT=0.167, ET=2
PCE=63 AADT=2957

Where:

V_{RT} = # of vehicles turning right per day (vpd)

P_T = percentage of trucks expressed as a decimal

E_T = 2.0 for level terrain (2.5% or less) or

E_T = 3.0 for rolling terrain (greater than 2.5%)

(E_T values based on "Highway Capacity Manual", 6th Edition, 2016, Exhibit 12-25)

Determine the major road AADT (two-way) volume—on approach with analyzed right turns—and plot on the appropriate chart to the right:

***The study should indicate any need for *offset* right turn. Typical questions to determine appropriate locations for an offset right turn lane:**

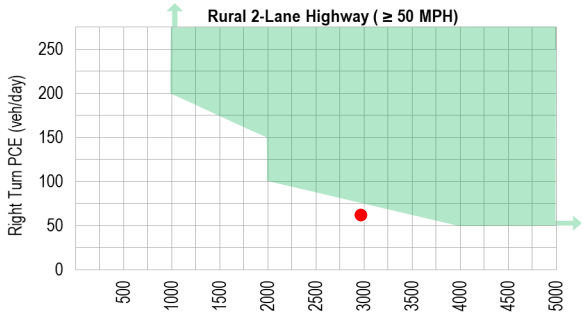
- Crash trends identified that are susceptible to correction by an offset right turn lane?
- Large volume of truck turning traffic?
- Sight distance issues?

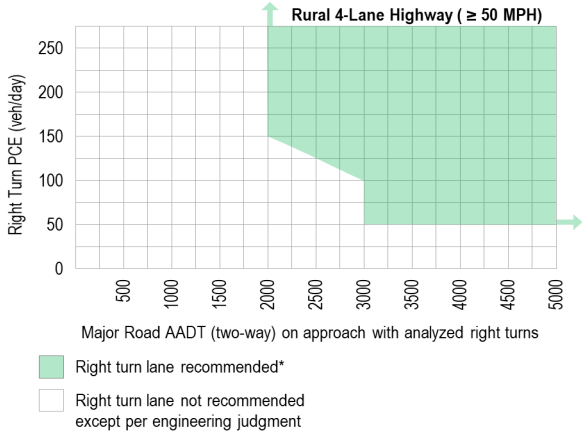
Signalized Intersections

If the number of right Turning Vehicles in a one-hour period is greater than the value shown below, then a right turn lane is recommended:

Speed Limit (mph)	Right turns (veh/hr)
20	300
25	300
30	250
35	200
40	150
45	100
50	50
55	50

From "Highway Capacity Manual", 6th Edition, 2016, Page 19-33





These charts adapted from "A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018 (Green Book) Figures 9-36a, 9-37a and NCHRP Report 745

HCS Two-Way Stop-Control Report

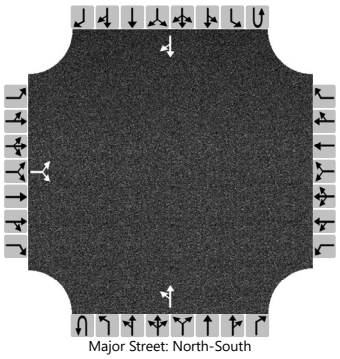
General Information

Analyst	L. Norby
Agency/Co.	NDDOT
Date Performed	8/15/2024
Analysis Year	2044
Time Analyzed	Pk Hr
Intersection Orientation	North-South
Project Description	ND 1804 Road Safety Review

Site Information

Intersection	ND 1804 & Casino Entrance
Jurisdiction	Williston District
East/West Street	ND 1804
North/South Street	Casino Entrance
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		40		7						7	260				257	44
Percent Heavy Vehicles (%)		1		0						9						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.41		6.20						4.19						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.51		3.30						2.28						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			51							8						
Capacity, c (veh/h)			489							1194						
v/c Ratio			0.10							0.01						
95% Queue Length, Q_{95} (veh)			0.3							0.0						
95% Queue Length, Q_{95} (ft)			7.6							0.0						
Control Delay (s/veh)			13.2							8.0	0.1					
Level of Service (LOS)			B							A	A					
Approach Delay (s/veh)		13.2								0.3						
Approach LOS		B								A						

HCS Two-Way Stop-Control Report

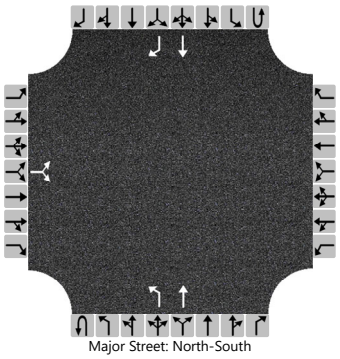
General Information

Analyst	L. Norby
Agency/Co.	NDDOT
Date Performed	8/15/2024
Analysis Year	2044
Time Analyzed	Pk Hr
Intersection Orientation	North-South
Project Description	ND 1804 Road Safety Review

Site Information

Intersection	ND 1804 & Casino Entrance
Jurisdiction	Williston District
East/West Street	ND 1804
North/South Street	Casino Entrance
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

23 USC § 407 Documents
NDDOT Reserves All Objections

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	1	1	0	0	0	1	1
Configuration			LR							L	T				T	R
Volume (veh/h)		40		7						7	260				257	44
Percent Heavy Vehicles (%)		1		0						9						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized														Yes		
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.41		6.20						4.19						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.51		3.30						2.28						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			51							8						
Capacity, c (veh/h)			505							1244						
v/c Ratio			0.10							0.01						
95% Queue Length, Q_{95} (veh)			0.3							0.0						
95% Queue Length, Q_{95} (ft)			7.6							0.0						
Control Delay (s/veh)			12.9							7.9						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)		12.9								0.2						
Approach LOS		B								A						

HCS Two-Way Stop-Control Report

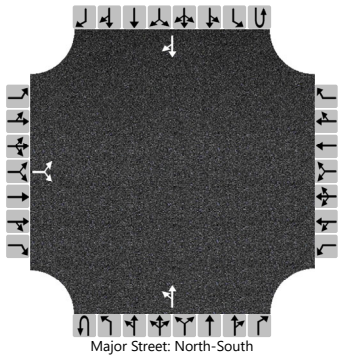
General Information

Analyst	L. Norby
Agency/Co.	NDDOT
Date Performed	8/15/2024
Analysis Year	2044
Time Analyzed	Pk Hr
Intersection Orientation	North-South
Project Description	ND 1804 Road Safety Review

Site Information

Intersection	ND 1804 & 147th Ave NW
Jurisdiction	Williston District
East/West Street	147th Ave NW
North/South Street	ND 1804
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		5		6						5	261				261	3
Percent Heavy Vehicles (%)		14		10						8						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.54		6.30						4.18						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.63		3.39						2.27						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			12							5						
Capacity, c (veh/h)			574							1241						
v/c Ratio			0.02							0.00						
95% Queue Length, Q_{95} (veh)			0.1							0.0						
95% Queue Length, Q_{95} (ft)			2.7							0.0						
Control Delay (s/veh)			11.4							7.9	0.0					
Level of Service (LOS)			B							A	A					
Approach Delay (s/veh)		11.4								0.2						
Approach LOS		B								A						

HCS Two-Way Stop-Control Report

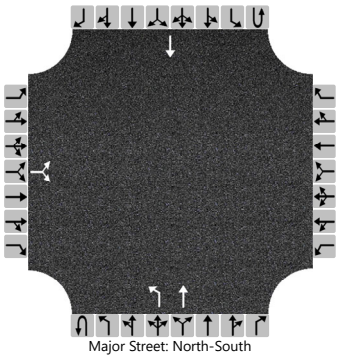
General Information

Analyst	L. Norby
Agency/Co.	NDDOT
Date Performed	8/15/2024
Analysis Year	2044
Time Analyzed	Pk Hr
Intersection Orientation	North-South
Project Description	ND 1804 Road Safety Review

Site Information

Intersection	ND 1804 & 147th Ave NW
Jurisdiction	Williston District
East/West Street	147th Ave NW
North/South Street	ND 1804
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

23 USC § 407 Documents
NDDOT Reserves All Objections

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	1	1	0	0	0	1	0
Configuration			LR							L	T				T	
Volume (veh/h)		5		6						5	261				261	
Percent Heavy Vehicles (%)		14		10						8						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.54		6.30						4.18						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.63		3.39						2.27						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			12							5						
Capacity, c (veh/h)			576							1245						
v/c Ratio			0.02							0.00						
95% Queue Length, Q_{95} (veh)			0.1							0.0						
95% Queue Length, Q_{95} (ft)			2.7							0.0						
Control Delay (s/veh)			11.4							7.9						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)		11.4								0.1						
Approach LOS		B								A						

HCS Two-Way Stop-Control Report

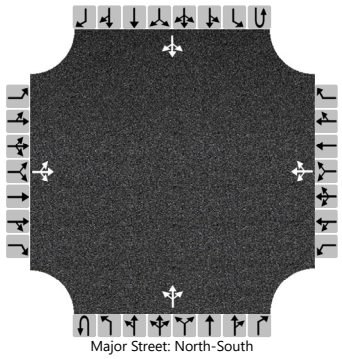
General Information

Analyst	L. Norby
Agency/Co.	NDDOT
Date Performed	8/19/2024
Analysis Year	2044
Time Analyzed	Pk Hr
Intersection Orientation	North-South
Project Description	ND 1804 Road Safety Review

Site Information

Intersection	ND 1804 & 44th Ln/147th Ave NW
Jurisdiction	Williston District
East/West Street	44th Ln/147th Ave NW
North/South Street	ND 1804
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

23 USC § 407 Documents
NDDOT Reserves All Objections

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	0	1	0	0	0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		5	1	2		0	1	10		3	252	1		10	252	5
Percent Heavy Vehicles (%)		13	27	62		34	33	34		83				32		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.23	6.77	6.82		7.44	6.83	6.54		4.93				4.42		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.62	4.24	3.86		3.81	4.30	3.61		2.95				2.49		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			9				12			3				11		
Capacity, c (veh/h)			434				645			932				1134		
v/c Ratio			0.02				0.02			0.00				0.01		
95% Queue Length, Q_{95} (veh)			0.1				0.1			0.0				0.0		
95% Queue Length, Q_{95} (ft)			3.0				3.2									
Control Delay (s/veh)			13.5				10.7			8.9	0.0	0.0		8.2	0.1	0.1
Level of Service (LOS)			B				B			A	A	A		A	A	A
Approach Delay (s/veh)		13.5				10.7				0.1				0.4		
Approach LOS		B				B				A				A		

HCS Two-Way Stop-Control Report

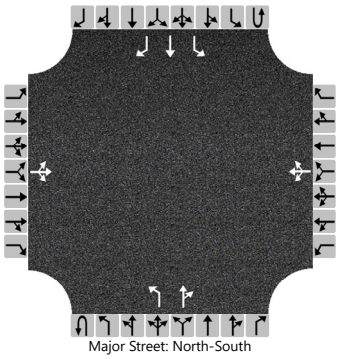
General Information

Analyst	L. Norby
Agency/Co.	NDDOT
Date Performed	8/19/2024
Analysis Year	2044
Time Analyzed	Pk Hr
Intersection Orientation	North-South
Project Description	ND 1804 Road Safety Review

Site Information

Intersection	ND 1804 & 44th Ln/147th Ave NW
Jurisdiction	Williston District
East/West Street	44th Ln/147th Ave NW
North/South Street	ND 1804
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

23 USC § 407 Documents
NDDOT Reserves All Objections

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	1	1	0	0	1	1	1
Configuration			LTR				LTR			L		TR		L	T	R
Volume (veh/h)		5	1	2		0	1	10		3	252	1		10	252	5
Percent Heavy Vehicles (%)		13	27	62		34	33	34		83				32		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized														No		
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.23	6.77	6.82		7.44	6.83	6.54		4.93				4.42		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.62	4.24	3.86		3.81	4.30	3.61		2.95				2.49		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			9				12			3				11		
Capacity, c (veh/h)			436				645			932				1134		
v/c Ratio			0.02				0.02			0.00				0.01		
95% Queue Length, Q_{95} (veh)			0.1				0.1			0.0				0.0		
95% Queue Length, Q_{95} (ft)			3.0				3.2			0.0				0.0		
Control Delay (s/veh)			13.4				10.7			8.9				8.2		
Level of Service (LOS)			B				B			A				A		
Approach Delay (s/veh)		13.4				10.7				0.1				0.3		
Approach LOS		B				B				A				A		

HCS Two-Way Stop-Control Report

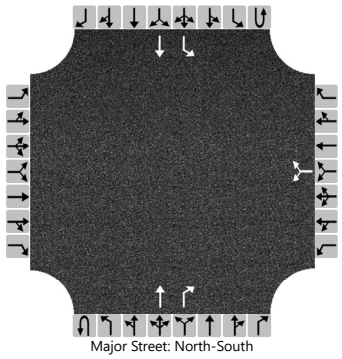
General Information

Analyst	L. Norby
Agency/Co.	NDDOT
Date Performed	8/19/2024
Analysis Year	2044
Time Analyzed	Pk Hr
Intersection Orientation	North-South
Project Description	ND 1804 Road Safety Review

Site Information

Intersection	ND 1804 & 42nd St/149th Ave
Jurisdiction	Williston District
East/West Street	42nd St/149th Ave
North/South Street	ND 1804
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	1	0	1	1	0
Configuration							LR				T	R		L	T	
Volume (veh/h)						19		17			236	25		16	240	
Percent Heavy Vehicles (%)						73		32						23		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized										No						
Median Type | Storage						Undivided										

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						7.13		6.52						4.33		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						4.16		3.59						2.41		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							39							17		
Capacity, c (veh/h)							494							1167		
v/c Ratio							0.08							0.01		
95% Queue Length, Q_{95} (veh)							0.3							0.0		
95% Queue Length, Q_{95} (ft)							10.7							0.0		
Control Delay (s/veh)							12.9							8.1		
Level of Service (LOS)							B							A		
Approach Delay (s/veh)						12.9								0.5		
Approach LOS						B								A		

HCS Two-Way Stop-Control Report

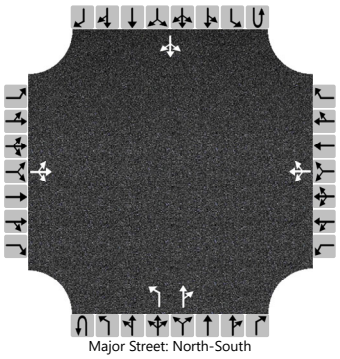
General Information

Analyst	L. Norby
Agency/Co.	NDDOT
Date Performed	8/19/2024
Analysis Year	2044
Time Analyzed	Pk Hr
Intersection Orientation	North-South
Project Description	ND 1804 Road Safety Review

Site Information

Intersection	ND 1804 & 145th Rd (south)
Jurisdiction	Williston District
East/West Street	145th Rd (south)
North/South Street	ND 1804
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

23 USC § 407 Documents
NDDOT Reserves All Objections

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	1	1	0	0	0	1	0
Configuration			LTR				LTR			L		TR			LTR	
Volume (veh/h)		2	0	3		7	0	9		3	315	10		8	313	4
Percent Heavy Vehicles (%)		4	0	4		1	0	4		10				4		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2		7.1	6.5	6.2		4.1				4.1		
Critical Headway (sec)		7.14	6.50	6.24		7.11	6.50	6.24		4.20				4.14		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.54	4.00	3.34		3.51	4.00	3.34		2.29				2.24		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			5				17			3				9		
Capacity, c (veh/h)			484				477			1171				1194		
v/c Ratio			0.01				0.04			0.00				0.01		
95% Queue Length, Q_{95} (veh)			0.0				0.1			0.0				0.0		
95% Queue Length, Q_{95} (ft)			0.0				2.6			0.0						
Control Delay (s/veh)			12.5				12.8			8.1				8.0	0.1	0.1
Level of Service (LOS)			B				B			A				A	A	A
Approach Delay (s/veh)	12.5				12.8				0.1				0.3			
Approach LOS	B				B				A				A			

HCS Two-Way Stop-Control Report

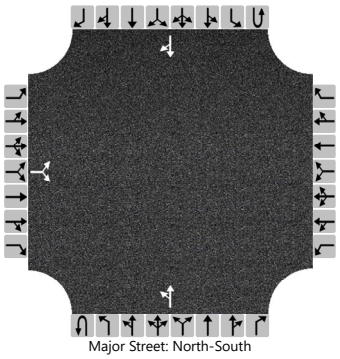
General Information

Analyst	L. Norby
Agency/Co.	NDDOT
Date Performed	8/22/2024
Analysis Year	2044
Time Analyzed	Pk Hr
Intersection Orientation	North-South
Project Description	ND 1804 Road Safety Review

Site Information

Intersection	ND 1804 & 145th Dr
Jurisdiction	Williston District
East/West Street	145th Dr NW
North/South Street	ND 1804
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

23 USC § 407 Documents
NDDOT Reserves All Objections

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		4		5						6	326				325	4
Percent Heavy Vehicles (%)		0		2						0						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.40		6.22						4.10						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.32						2.20						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			10							7						
Capacity, c (veh/h)			516							1212						
v/c Ratio			0.02							0.01						
95% Queue Length, Q_{95} (veh)			0.1							0.0						
95% Queue Length, Q_{95} (ft)			2.5							0.0						
Control Delay (s/veh)			12.1							8.0	0.1					
Level of Service (LOS)			B							A	A					
Approach Delay (s/veh)		12.1								0.2						
Approach LOS		B								A						

HCS Two-Way Stop-Control Report

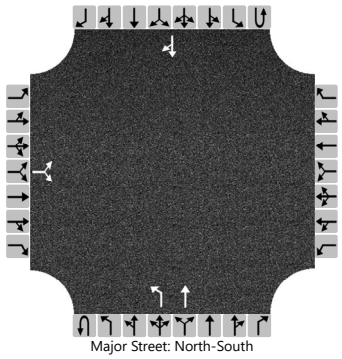
General Information

Analyst	L. Norby
Agency/Co.	NDDOT
Date Performed	8/22/2024
Analysis Year	2044
Time Analyzed	Pk Hr
Intersection Orientation	North-South
Project Description	ND 1804 Road Safety Review

Site Information

Intersection	ND 1804 & 145th Dr
Jurisdiction	Williston District
East/West Street	145th Dr NW
North/South Street	ND 1804
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

23 USC § 407 Documents
NDDOT Reserves All Objections

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	1	1	0	0	0	1	0
Configuration			LR							L	T					TR
Volume (veh/h)		4		5						6	326				325	4
Percent Heavy Vehicles (%)		0		2						0						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.40		6.22						4.10						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.50		3.32						2.20						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			10							7						
Capacity, c (veh/h)			517							1212						
v/c Ratio			0.02							0.01						
95% Queue Length, Q_{95} (veh)			0.1							0.0						
95% Queue Length, Q_{95} (ft)			2.5							0.0						
Control Delay (s/veh)			12.1							8.0						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)	12.1								0.1							
Approach LOS	B								A							

HCS Two-Way Stop-Control Report

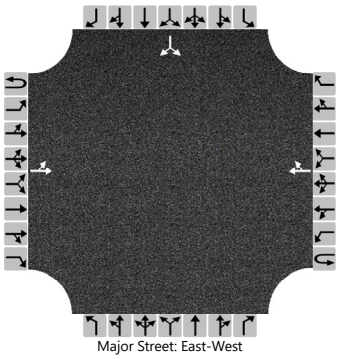
General Information

Analyst	L. Norby
Agency/Co.	NDDOT
Date Performed	8/22/2024
Analysis Year	2044
Time Analyzed	Pk Hr
Intersection Orientation	East-West
Project Description	ND 1804 Road Safety Review

Site Information

Intersection	ND 1804 & Co Rd 5 (153rd Ave NW)
Jurisdiction	Williston District
East/West Street	ND 1804
North/South Street	Co Rd 5
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



23 USC § 407 Documents
NDDOT Reserves All Objections

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)		45	243				247	15						16		44
Percent Heavy Vehicles (%)		53												32		53
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)		4.63												6.72		6.73
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.68												3.79		3.78

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		49													65	
Capacity, c (veh/h)		1035													546	
v/c Ratio		0.05													0.12	
95% Queue Length, Q_{95} (veh)		0.1													0.4	
95% Queue Length, Q_{95} (ft)		3.6													13.8	
Control Delay (s/veh)		8.7	0.5												12.5	
Level of Service (LOS)		A	A												B	
Approach Delay (s/veh)		1.8												12.5		
Approach LOS		A												B		

HCS Two-Way Stop-Control Report

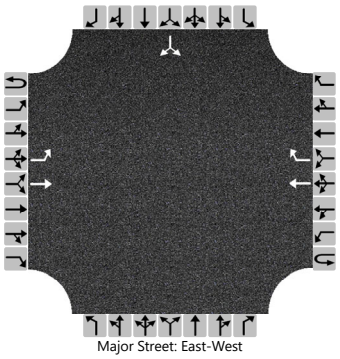
General Information

Analyst	L. Norby
Agency/Co.	NDDOT
Date Performed	8/22/2024
Analysis Year	2044
Time Analyzed	Pk Hr
Intersection Orientation	East-West
Project Description	ND 1804 Road Safety Review

Site Information

Intersection	ND 1804 & Co Rd 5 (153rd Ave NW)
Jurisdiction	Williston District
East/West Street	ND 1804
North/South Street	Co Rd 5
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



23 USC § 407 Documents
NDDOT Reserves All Objections

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	1	1	0	0	0	1	1		0	0	0		0	1	0
Configuration		L	T				T	R							LR	
Volume (veh/h)		45	243				247	15						16		44
Percent Heavy Vehicles (%)		53												32		53
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized							No									
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.63												6.72		6.73
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.68												3.79		3.78

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		49													65	
Capacity, c (veh/h)		1035													554	
v/c Ratio		0.05													0.12	
95% Queue Length, Q_{95} (veh)		0.1													0.4	
95% Queue Length, Q_{95} (ft)		3.6													13.8	
Control Delay (s/veh)		8.7													12.4	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)		1.4												12.4		
Approach LOS		A												B		

HCS Two-Way Stop-Control Report

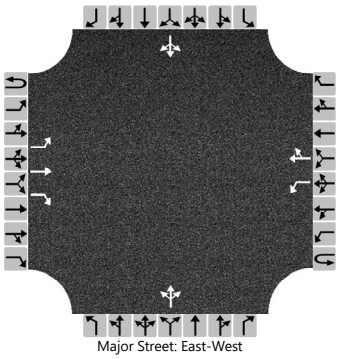
General Information

Analyst	L. Norby
Agency/Co.	NDDOT
Date Performed	8/29/2024
Analysis Year	2044
Time Analyzed	Pk Hr
Intersection Orientation	East-West
Project Description	ND 1804 Road Safety Review

Site Information

Intersection	US 2 & Co Rd 5 (153rd Ave NW)
Jurisdiction	Williston District
East/West Street	ND 1804
North/South Street	Co Rd 5
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

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	1	1	1	0	1	1	0		0	1	0		0	1	0
Configuration		L	T	R		L		TR			LTR				LTR	
Volume (veh/h)		4	100	6		44	98	54		5	7	46		3	8	7
Percent Heavy Vehicles (%)		36				55				49	48	54		23	29	41
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No														
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.46				4.65				7.59	6.98	6.74		7.33	6.79	6.61
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.52				2.70				3.94	4.43	3.79		3.71	4.26	3.67

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		4				48					63				20	
Capacity, c (veh/h)		1231				1201					713				588	
v/c Ratio		0.00				0.04					0.09				0.03	
95% Queue Length, Q_{95} (veh)		0.0				0.1					0.3				0.1	
95% Queue Length, Q_{95} (ft)		0.0				3.6					10.7				3.2	
Control Delay (s/veh)		7.9				8.1					10.5				11.3	
Level of Service (LOS)		A				A					B				B	
Approach Delay (s/veh)		0.3				1.8				10.5				11.3		
Approach LOS		A				A				B				B		