

APPENDIX A1: EXISTING TRAFFIC CONDITIONS AND CRASH HISTORY



To: Steve Gramm, SDDOT

From: Chase Cutler, PE, PTOE / Ben White, PE

Subject: SD Highway 38 - Existing Traffic and Operations Analysis

Date: April 20, 2023

Introduction

The South Dakota Department of Transportation (SDDOT), City of Hartford, Town of Humboldt, City of Sioux Falls, Sioux Falls Metropolitan Planning Organization (MPO), Minnehaha County, and Federal Highway Administration (FHWA) initiated an assessment of approximately 14.2 miles of the SD Highway 38 (SD 38) corridor from the SD Highway 19 intersection in Humboldt, South Dakota to the Marion Road intersection in Sioux Falls, South Dakota. The study segment of SD 38 is predominantly a rural two-lane highway and located in a rapidly developing area and serves as a viable alternate route to Interstate-90. Development pressure is expected to impact the SD 38 corridor with higher traffic volumes, greater demand for multi-modal (bike and pedestrian) uses, and additional access management concerns.

Segments of the SD 38 corridor are expected to need major rehabilitation or reconstruction within the next 10 to 15 years. Primary concerns of this study are to ensure the roadway is reconstructed to meet future traffic volume demands.

The purpose of this technical memorandum is to document the existing conditions traffic assessment in support of the study being completed along SD 38. This technical report will provide an existing conditions assessment of the two-lane highway and at each of the study intersections. **Table 1** depicts the eighteen study intersections reviewed as part of the existing conditions assessment and traffic data review.

TABLE 1: SD 38 STUDY INTERSECTIONS

Main Line	Cross Street(s)
SD Highway 38	SD Highway 19 / 457th Avenue
SD Highway 38	459th Avenue
SD Highway 38	I-90 Speedway Entrance
SD Highway 38	Western Avenue / 463rd Avenue
SD Highway 38	Main Avenue
SD Highway 38	Vandemark Avenue
SD Highway 38	2nd Street
SD Highway 38	West Central High School Entrance
SD Highway 38	Railroad Street / 464th Avenue
SD Highway 38	Mickelson Road/260th Street
SD Highway 38	466th Avenue (North)
SD Highway 38	WB I-90 Exit 390
SD Highway 38	EB I-90 Exit 390
SD Highway 38	466th Avenue (South)
SD Highway 38	County Highway 141 / 468th Avenue
SD Highway 38	County Highway 139 / 469th Avenue
SD Highway 38	La Mesa Drive / 470th Avenue
SD Highway 38	Marion Road

Existing Conditions

The study area was reviewed in an effort to get an accurate reflection of the traffic operations experienced on a daily basis. This included a review of the local roadways, land uses, and traffic volumes.

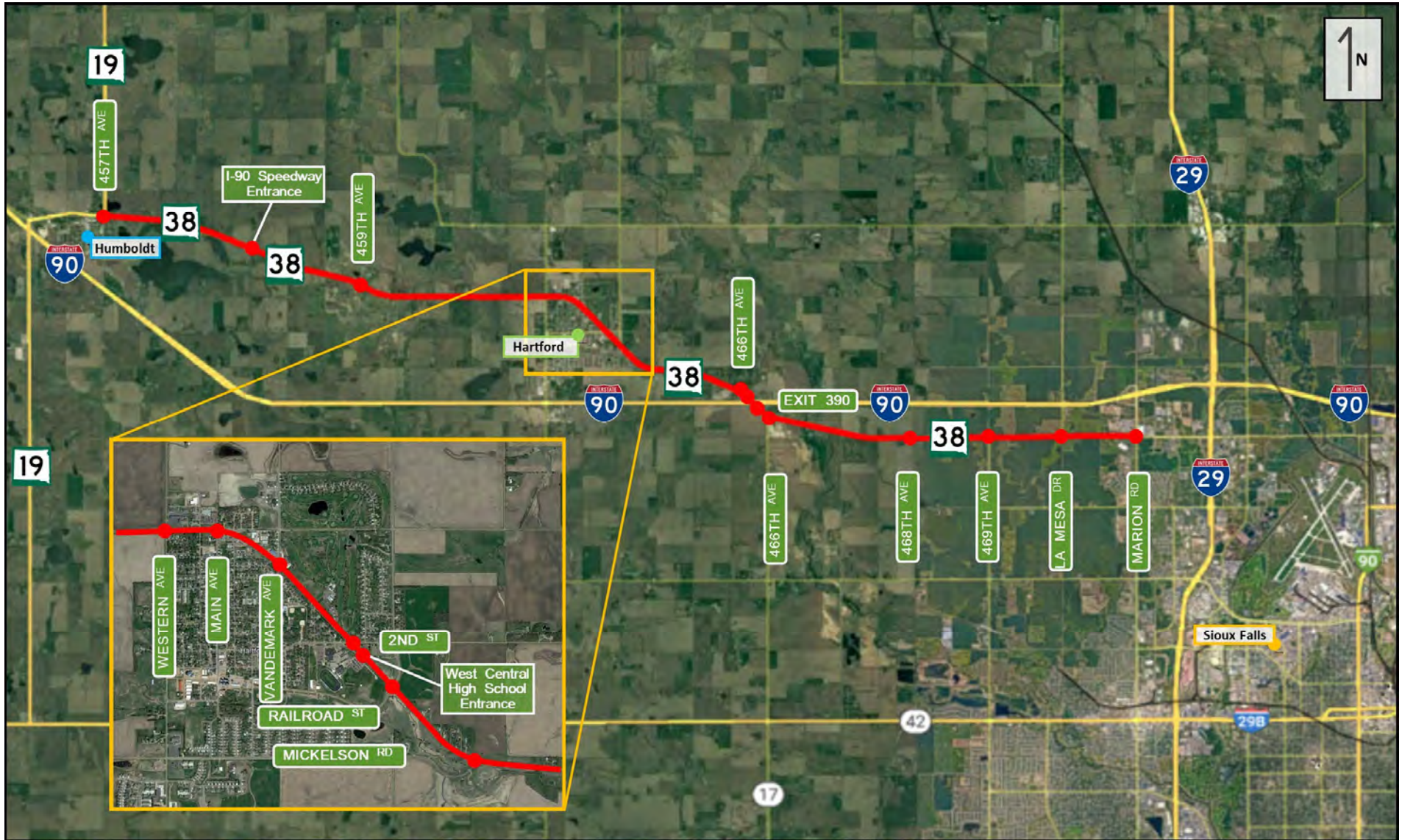
Existing Roadways

The existing roadway within the study area consists of a 14.2 mile stretch of SD Highway 38 along with 18 intersections with county roads, interstate ramp terminals, and local roads. See **Figure 1** for a depiction of the existing road network within the study area.

SD Highway 38 is a state highway that carries a functional classification of collector between Humboldt to Hartford and a federal functional classification of minor arterial between Hartford to Sioux Falls. It runs east/west through South Dakota between the cities of Mitchell and Sioux Falls. Within the study limits, the SD 38 corridor extends from the SD Highway 19 intersection, east of Humboldt, passes through the City of Hartford and ends at the Marion Road intersection, west of Sioux Falls. The posted speed limit on SD Highway 38 ranges from 65 mph to 35 mph.

The study segment of SD 38 exists primarily as a two-lane rural cross-section with paved shoulders. However, within the City of Hartford the roadway contains an urban cross section with curb and gutter, and street lighting between the intersection of SD 38 & 463rd Avenue and SD 38 & Vandemark Avenue. The SD 38 & I-90 Exit 390 interchange is a folded diamond interchange with stop-controlled ramp terminal intersections.

FIGURE 1: LOCATION FEATURES



There are a total of eighteen study intersections within the study limits including seventeen stop-controlled intersection and one traffic signal-controlled intersection. The pedestrian accommodations within the study area include marked crosswalks at five intersections within the City of Hartford including the study intersections of SD 38 & Vandemark Avenue, SD 38 & 2nd Street, SD 38 & West High School Entrance, and SD 38 & Railroad Street. Additionally, there are marked pedestrian crosswalks and pedestrian signal heads with pushbuttons at the intersection of SD 38 & Marion Road. Aerial views of pedestrian crosswalks can be seen in **Appendix A**.

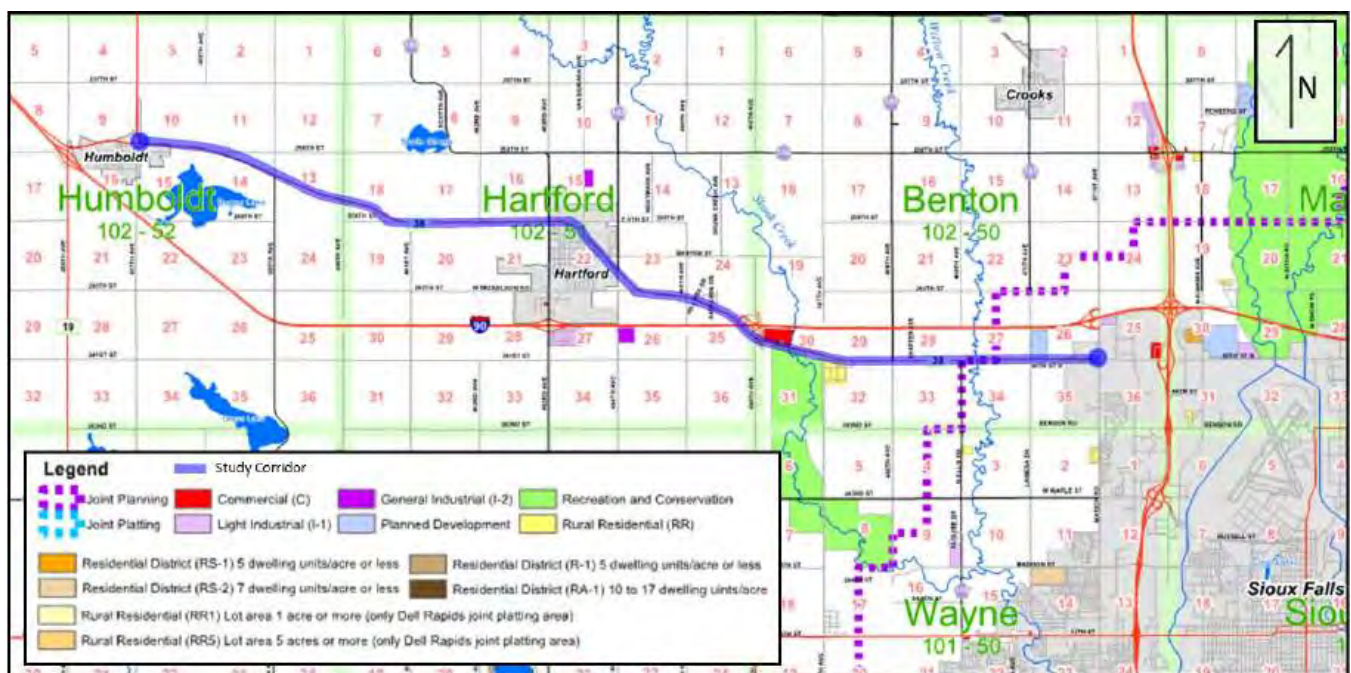
Existing Land Use

The study area consists of predominantly agricultural land along the SD Highway 38 corridor with a varied mix of residential, commercial, and industrial land uses within the Town of Humboldt, the City of Hartford, and the City of Sioux Falls. **Figure 2** illustrates the current Minnehaha County land uses within the study area.

The Town of Humboldt depicts land use adjacent to the SD 38 study corridor, near the intersection with SD 19, as commercial in the southwest quadrant and single family residential elsewhere, with agricultural land use along SD 38 to the east.

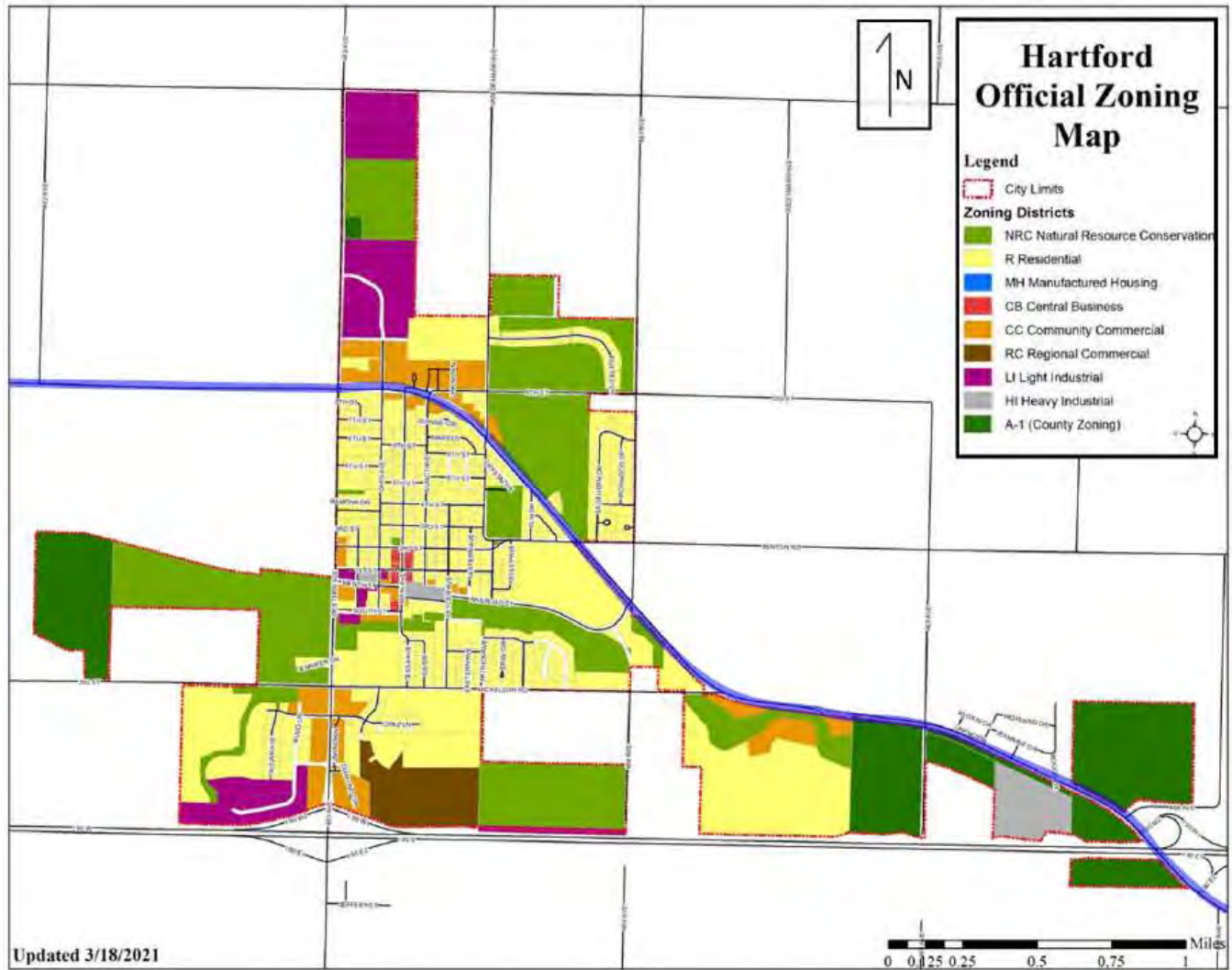
There are a number of commercial and industrial businesses clustered near the I-90 Exit 390 interchange and there is conservation land and rural residential designated land use along SD 38 southeast of the interchange.

FIGURE 2: EXISTING MINNEHAHA COUNTY LAND USE (ENVISION 2035)



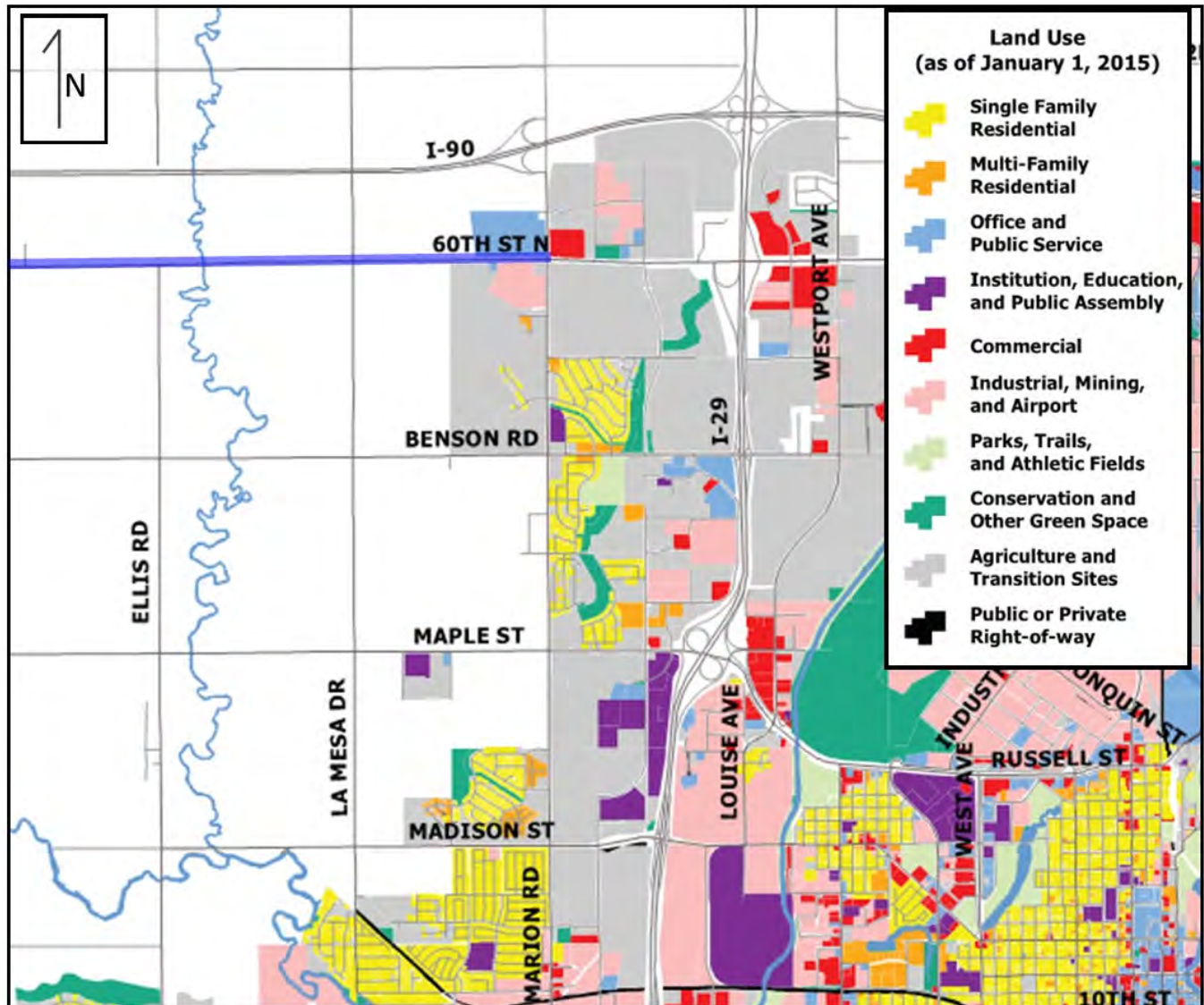
Through the City of Hartford, land uses along the SD 38 corridor include residential, commercial, natural resource conservation, and heavy industrial land uses. **Figure 3** depicts the current City of Hartford land use adjacent to the SD 38 study corridor.

FIGURE 3: EXISTING CITY OF HARTFORD LAND USE (CITY ZONING MAP)



The City of Sioux Falls municipal limits extend through the intersection of SD 38 & Marion Road. Land use adjacent to that intersection include office and public service, commercial, industrial land use, and agricultural. **Figure 4** depicts the current City of Sioux Falls land use adjacent to the study corridor.

FIGURE 4: EXISTING CITY OF SIOUX FALLS LAND USE (SHAPE SIOUX FALLS 2040)

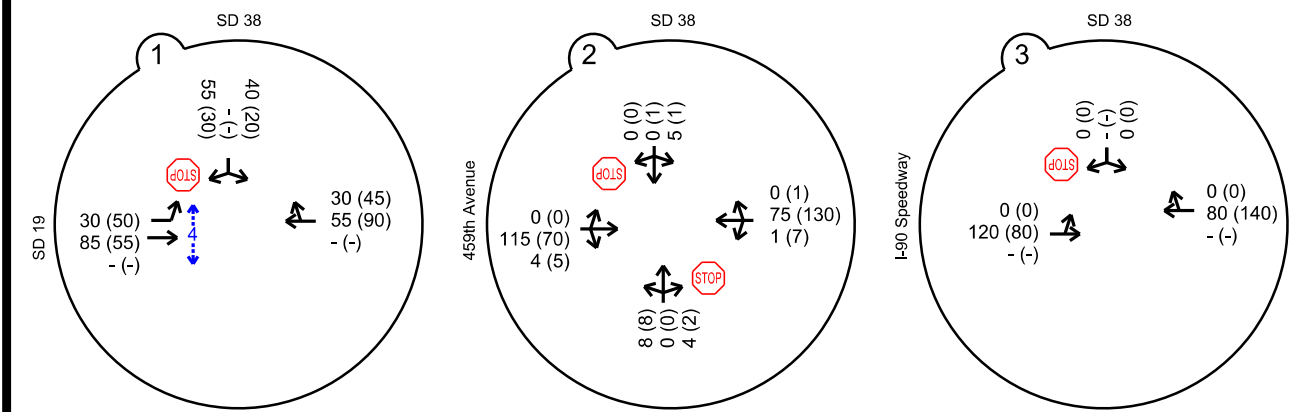
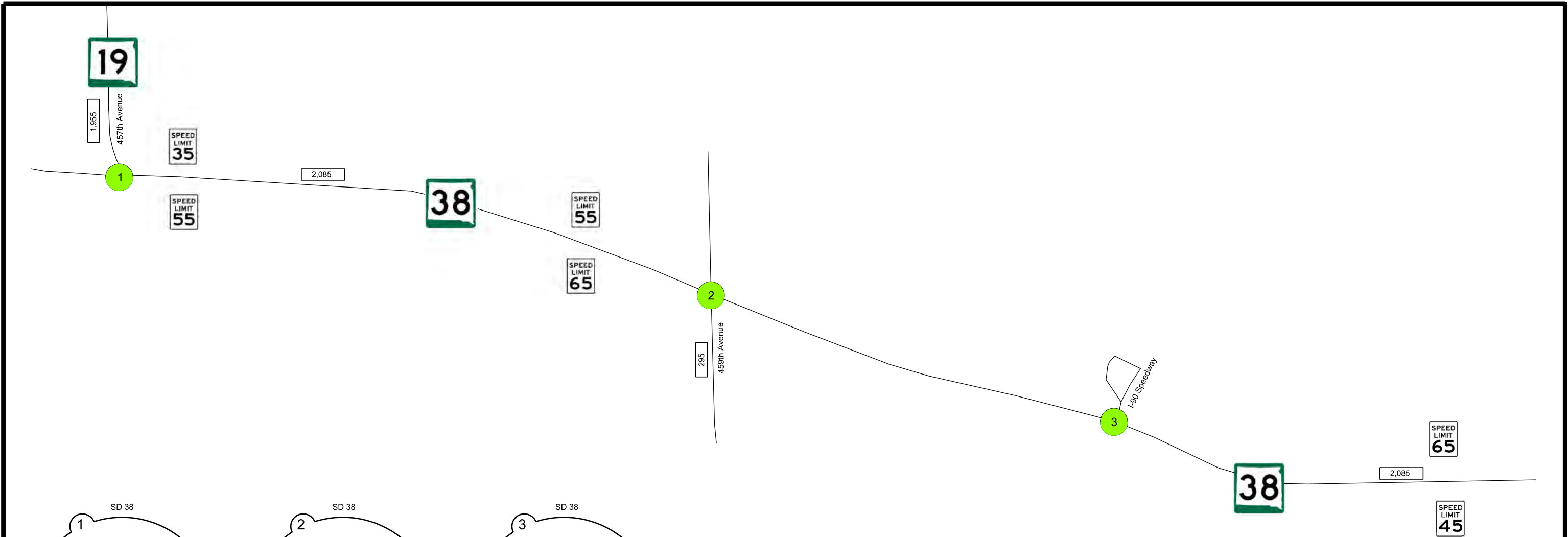


Existing Traffic Data

Traffic volume data was collected at 18 study intersections along the SD 38 corridor on November 2, 2022, for a 12-hour period (7:00AM to 7:00PM). The count data included turning movements by approach in 15-minute intervals with composition of passenger vehicles and trucks. The intersection of SD Highway 38 & the I-90 Speedway Entrance has been scheduled for additional data collection in spring 2023 to account for event traffic at the raceway.

Review of the traffic volume data revealed distinct AM and PM peak hour periods at each intersection. The peak hour periods at each intersection were then comparatively judged to determine the peaking period of the corridor. It was determined that the AM peak hour occurred between 7:15-8:15 AM and the PM peak hour period occurred between 4:45-5:45 PM. See **Figure 5** for the AM and PM peak hour turning movements at each intersection.

Hourly distribution of traffic at intersections along the SD 38 corridor were examined to determine the characteristics exhibited at each intersection approach leg throughout a typical day. The peaking characteristics of the study corridor are also evident in the hourly traffic distribution data with a distinctive AM and PM peak hour. The hourly distribution at each intersection approach leg can be seen in **Appendix A**.



INTERSECTION PEAK HOUR OPERATIONS				HCM 7TH EDITION LEVEL OF SERVICE	
ID	INTERSECTIONS	CONTROL TYPE		AM	PM
		SIGNAL	STOP		
1	SD Highway 38 & SD Highway 19 / 457th Ave		X	A	A
2	SD Highway 38 & 459th Ave		X	A	B
3	SD Highway 38 & I-90 Speedway		X	A	A

NOTES: TWO-WAY STOP CONTROL LOS REPRESENTATIVE OF WORST CASE STOP CONTROLLED APPROACH.
* DENOTES V/C RATIO > 1

LEGEND

xx , x x x

xxx (xxx)

AM

PM

INTERSECTION LEVEL OF SERVICE

A

B

C

D

E

F

2022 AVERAGE DAILY TRAFFIC VOLUME (ADT)

AM (PM) PEAK HOUR VOLUME

TURNING VOLUME BY MOVEMENT AND LANE CONFIGURATION

PEDESTRIAN VOLUME ON APPROACH (IF PRESENT)

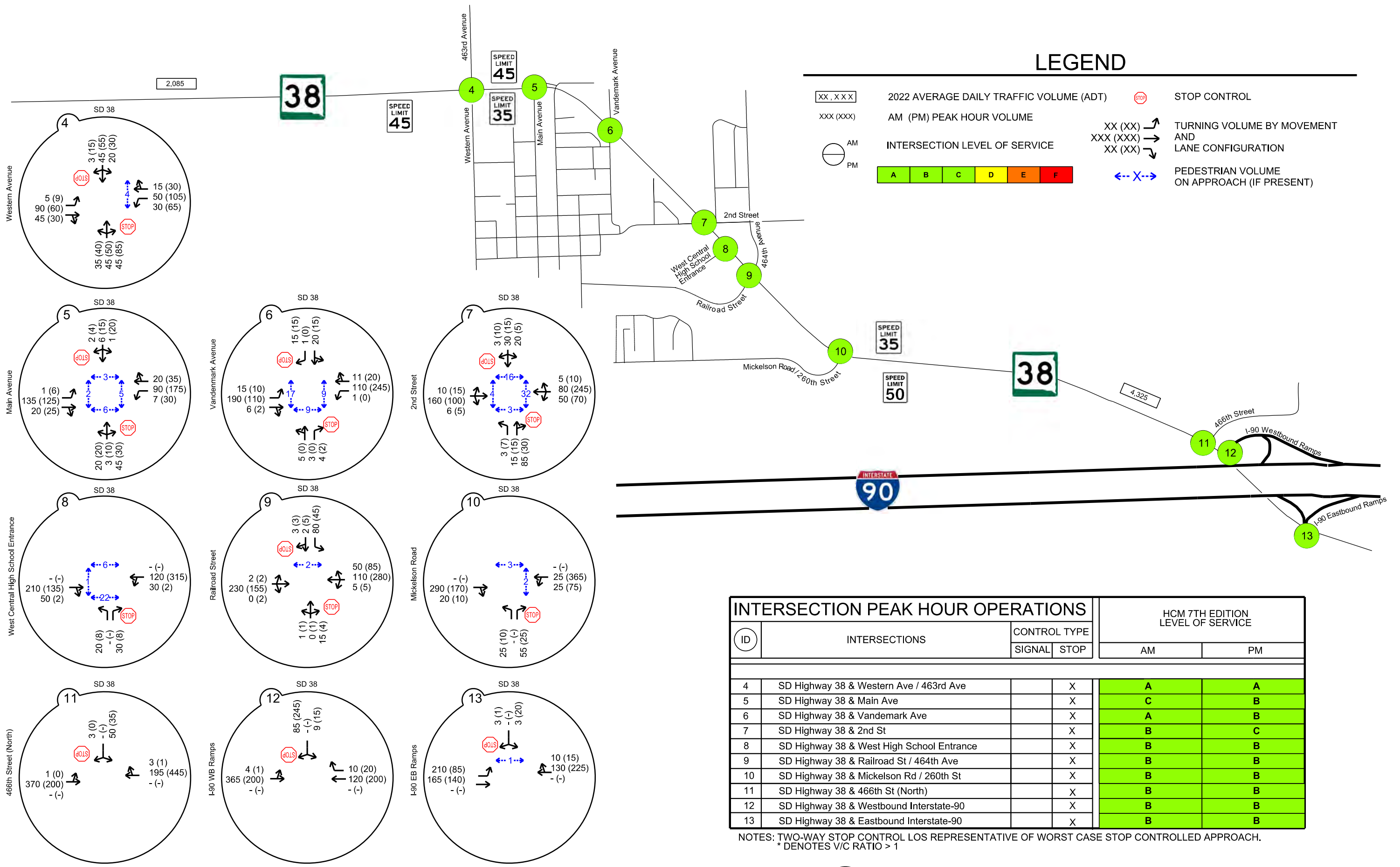
STOP CONTROL

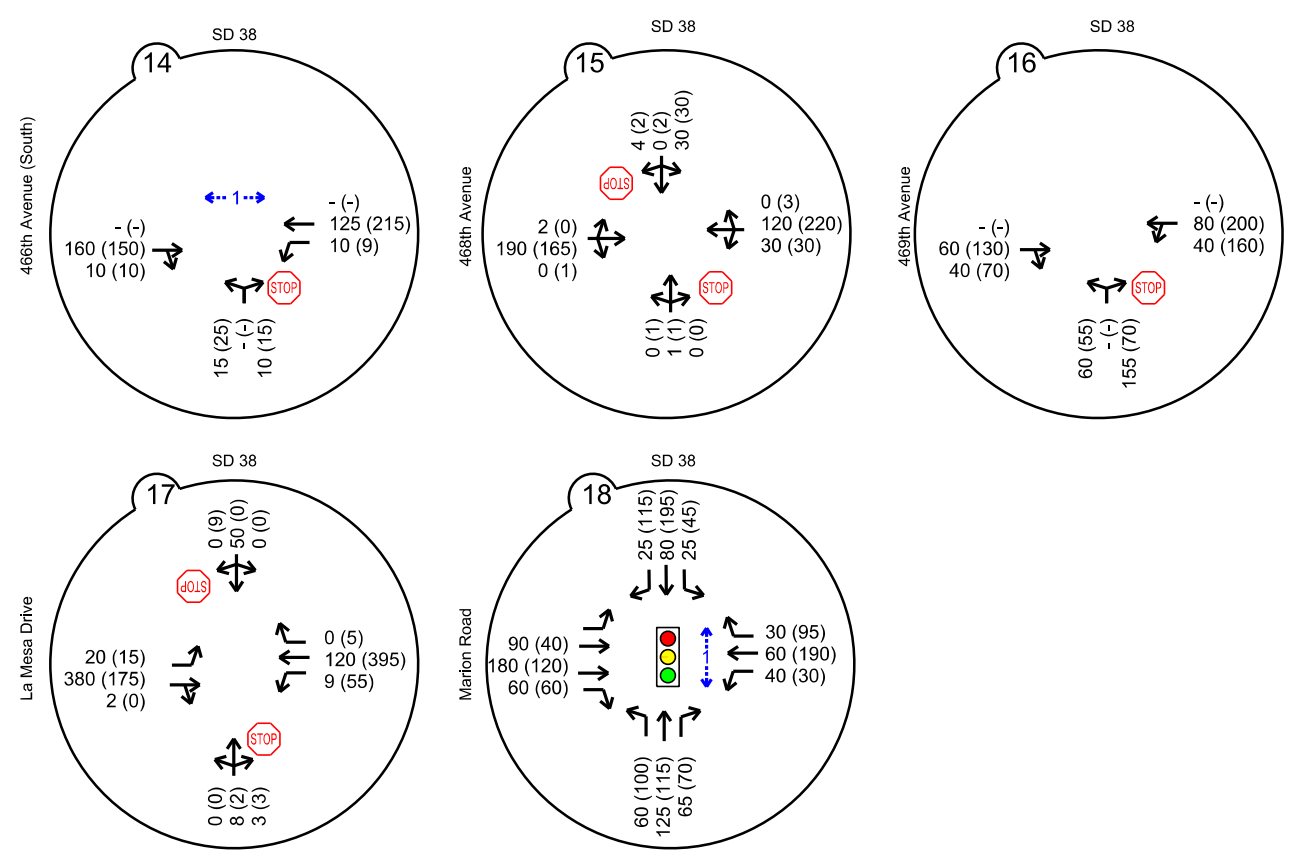
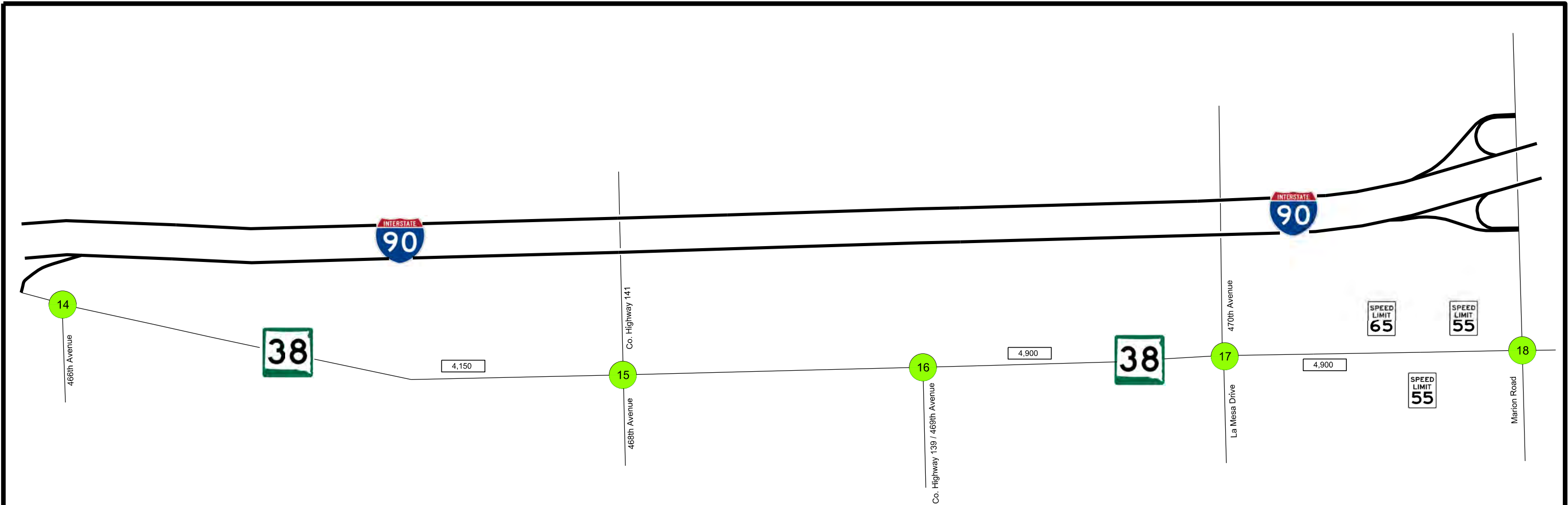
SD HIGHWAY 38 TRAFFIC STUDY
EXISTING CONDITIONS
SD 38 CORRIDOR
MINNEHAHA COUNTY, SOUTH DAKOTA

FEB 2023

FIGURE 5

PAGE 7





INTERSECTION PEAK HOUR OPERATIONS				HCM 7TH EDITION LEVEL OF SERVICE	
ID	INTERSECTIONS	CONTROL TYPE		AM	PM
		SIGNAL	STOP		
14	SD Highway 38 & 466th Ave (South)		X	B	C
15	SD Highway 38 & Co. Hwy 141 / 468th Ave		X	B	B
16	SD Highway 38 & Co. Hwy 139 / 469th Ave		X	B	B
17	SD Highway 38 & La Mesa Drive / 470th Ave		X	B	C
18	SD Highway 38 & Marion Drive	X		B	B

NOTES: TWO-WAY STOP CONTROL LOS REPRESENTATIVE OF WORST CASE STOP CONTROLLED APPROACH.
* DENOTES V/C RATIO > 1

LEGEND

XX, X X X

2022 AVERAGE DAILY TRAFFIC VOLUME (ADT)

xxx (xxx)

AM (PM) PEAK HOUR VOLUME

AM

PM

INTERSECTION LEVEL OF SERVICE

XX (XX)

XXX (XXX)

XX (XX)

TURNING VOLUME BY MOVEMENT AND LANE CONFIGURATION

A

B

C

D

E

F

STOP

STOP CONTROL

<--X-->

PEDESTRIAN VOLUME ON APPROACH (IF PRESENT)



Existing Traffic Operations

Intersection level of service (LOS) is primarily a function of peak hour turning movement volumes, intersection lane configuration, and traffic control. For intersection analysis, the Highway Capacity Manual (HCM) defines LOS in terms of the average control delay at the intersection in seconds per vehicle. Two-lane highway LOS is primarily a function of the roadway configuration, vehicle speeds, and availability of passing opportunities. For two-lane highway analysis, the HCM defines LOS in terms of the following density or the number of vehicles in a follower state per mile per lane. The results of a HCM analysis are typically presented in the form of a letter grade (A-F) that provides a qualitative estimate of the operational efficiency or effectiveness of the corridor. Much like an academic report card, LOS A represents the best range of operating conditions (i.e., motorists experiencing little delay or congestion) and LOS F represents the worst (i.e., extreme delay or severe congestion).

Table 2 defines the control delay range corresponding to each LOS for unsignalized and signalized intersection locations. At intersections, LOS E is considered to be at capacity and typically represents a scenario in which significant queuing is present or traffic signal cycle failure is evident. For unsignalized intersections, the intersection LOS is given by the worst approach LOS. For instance, an intersection with LOS D on one approach and LOS B on the rest would result in LOS D for the intersection.

TABLE 2: LEVEL OF SERVICE FOR CONTROL DELAY (INTERSECTIONS)

Level Of Service	Unsignalized	Traffic Signal
	Control Delay (sec/veh)	Control Delay (sec/veh)
A	≤ 10	≤ 10
B	> 10 and ≤ 15	> 10 and ≤ 20
C	> 15 and ≤ 25	> 20 and ≤ 35
D	> 25 and ≤ 35	> 35 and ≤ 55
E	> 35 and ≤ 50	> 55 and ≤ 80
F	> 50	> 80

Following SDDOT guidance, LOS C is the desired minimum traffic operational goal for intersections in rural environments while LOS D is an acceptable operational goal for intersections in dense urban environments. The intersections within the study area have a desired traffic operational goal of LOS C.

Table 3 defines the follower density range corresponding to each LOS for two-lane highway segments. On two-lane highways, LOS E is considered to be at capacity. For two-lane highway segments, a LOS B would represent a scenario where some platooning is present with the potential passing demand and passing opportunities balanced while a LOS D would represent a scenario where significant platooning is present and passing demand far exceeds passing opportunities.

TABLE 3: LEVEL OF SERVICE FOR FOLLOWER DENSITY (TWO-LANE HIGHWAYS)

Level Of Service	Speed ≥ 50 mph	Speed < 50 mph
	Follower Density (followers/mi/ln)	Follower Density (followers/mi/ln)
A	≤ 2.0	≤ 2.5
B	> 2.0 – 4.0	> 2.5 – 5.0
C	> 4.0 – 8.0	> 5.0 – 10.0
D	> 8.0 – 12.0	> 10.0 – 15.0
E	> 12.0	> 15.0
F	Demand exceeds capacity	

Following SDDOT guidance, LOS C is the desired traffic operational goal for highways in rural environments (functional classification of collector) and LOS D is considered the minimal acceptable operations for highways in

urban environments (functional classification of minor arterial). The SD 38 highway segments within the study area are categorized as rural with federal functional classification of collector between Humboldt to Hartford and categorized as urban with federal functional classification of minor arterial between Hartford to Sioux Falls. The two-lane highway segments within the study area have a desired traffic operational goal of LOS C.

Traffic operations analysis for the study area intersections included capacity evaluation using the Highway Capacity Manual (HCM) 7th Edition techniques thru use of the Highway Capacity Software (HCS) 2022. Traffic operations analysis used existing intersection geometry with 2022 traffic volumes and posted travel speeds. Output reports from the HCS2022 software are available in **Appendix B**.

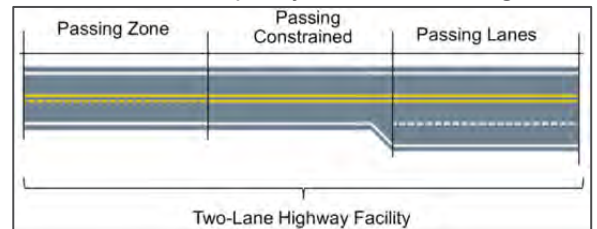
The results of the intersection capacity analysis can be seen in **Figure 5** and **Table 4** below.

TABLE 4: HCM TRAFFIC INTERSECTION OPERATIONS – EXISTING 2022

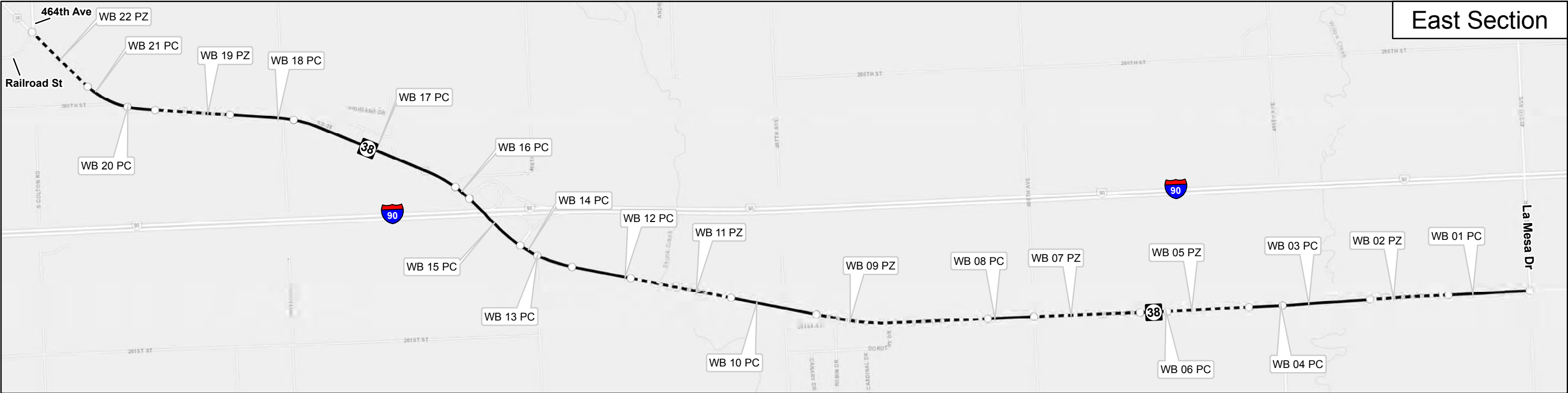
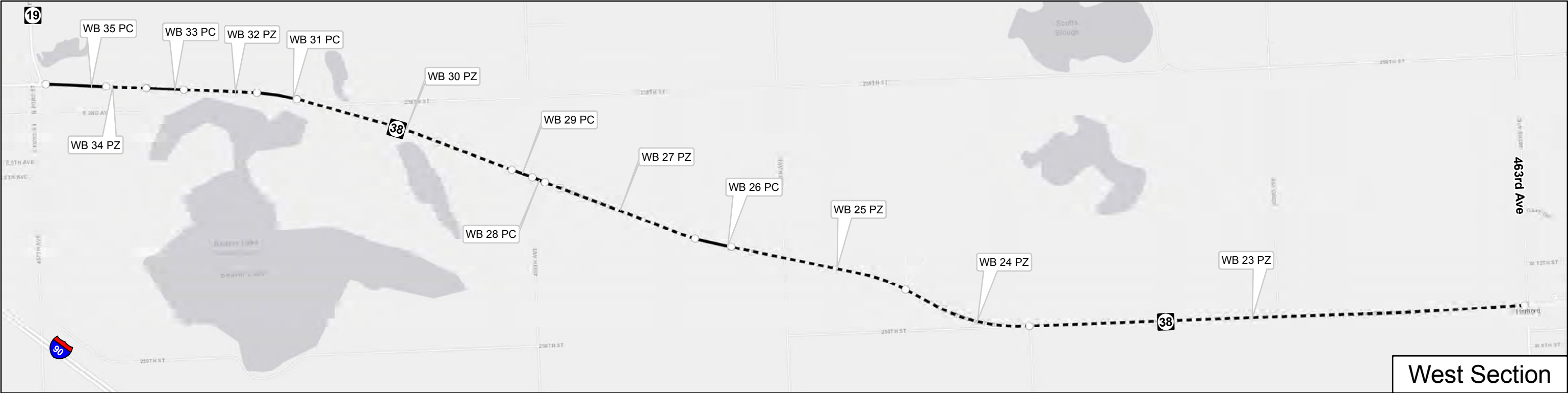
ID #	SD Hwy 38 Cross Street(s)	AM PEAK HOUR		PM PEAK HOUR	
		Delay	LOS	Delay	LOS
1	SD Highway 19 / 457th Avenue	9.9	A	10.2	B
2	459 th Avenue	10.0	A	11.0	B
3	I-90 Speedway Entrance	0.0	A	0.0	A
4	Western Avenue / 463rd Avenue	11.9	B	14.0	B
5	Main Avenue	11.2	B	12.9	B
6	Vandemark Avenue	11.2	B	11.1	B
7	2nd Street	14.0	B	14.2	B
8	West Central High School Entrance	10.9	B	10.7	B
9	Railroad Street / 464th Avenue	14.2	B	14.1	B
10	Mickelson Road/260th Street	11.5	B	11.3	B
11	466th Avenue (North)	14.9	B	14.5	B
12	WB I-90 Exit 390	10.2	B	12.3	B
13	EB I-90 Exit 390	14.1	B	14.8	B
14	466th Avenue (South)	11.0	B	11.1	B
15	County Highway 141 / 468th Avenue	12.6	B	12.6	B
16	County Highway 139 / 469th Avenue	12.5	B	14.5	B
17	La Mesa Drive / 470th Avenue	14.8	B	16.4	C
18	Marion Road	16.0	B	18.7	B

Under the existing conditions, the traffic operations analysis showed acceptable operations at all intersections within the study area, with intersections achieving LOS B or greater during both the AM and PM peak hours. The exception was the SD 38 & La Mesa Drive/470th Avenue intersection which produced a LOS C during the PM peak hour.

Traffic operations analysis for the study area SD Highway 38 corridor included capacity evaluation using the Highway Capacity Manual (HCM) 7th Edition techniques through use of the Highway Capacity Software (HCS) 2022. The highway was segmented according to the two-lane highway methodology presented in chapter 15 of HCM7, with segment breaks reflecting the passing zones. The two-lane highway traffic operations analysis used existing highway geometry with 2022 traffic volumes and posted travel speeds. Output reports from the HCS2022 software are available in **Appendix B**.



The segmentation for analysis can be seen in **Figure 6**. The results of the two-lane highway capacity analysis can be seen in **Table 5** and **Table 6**.



Highway 38 Analysis Segments

Westbound Lanes

FIGURE 6

Legend

- Analysis Segments**
- Passing Constrained
 - - - - - Passing Zones



0 0.5 1 Miles



TABLE 5: HCM TRAFFIC HIGHWAY OPERATIONS – EXISTING 2022, EASTBOUND SD 38

ID #	Segment Type	AM PEAK HOUR		PM PEAK HOUR	
		Density	LOS	Density	LOS
SD Highway 38 Eastbound					
EB 1	Passing Zone	0.5	A	0.2	A
EB 2	Passing Constrained	0.5	A	0.2	A
EB 3	Passing Zone	0.4	A	0.2	A
EB 4	Passing Constrained	0.5	A	0.2	A
EB 5	Passing Zone	0.4	A	0.2	A
EB 6	Passing Constrained	0.5	A	0.2	A
EB 7	Passing Zone	0.4	A	0.2	A
EB 8	Passing Zone	0.4	A	0.2	A
EB 9	Passing Constrained	0.5	A	0.2	A
EB 10	Passing Zone	0.4	A	0.2	A
EB 11	Passing Zone	0.4	A	0.3	A
EB 12	Passing Constrained	0.6	A	0.3	A
EB 13	Passing Zone	0.5	A	0.3	A
EB 14	Passing Constrained	1.0	A	0.6	A
EB 15	Passing Zone	3.1	B	1.5	A
EB 16	Passing Constrained	3.4	B	1.7	A
EB 17	Passing Zone	3.1	B	1.5	A
EB 18	Passing Zone	2.7	B	1.0	A
EB 19	Passing Constrained	2.8	B	1.0	A
EB 20	Passing Constrained	3.0	B	1.2	A
EB 21	Passing Constrained	3.0	B	1.3	A
EB 22	Passing Constrained	0.8	A	0.8	A
EB 23	Passing Constrained	1.0	A	0.8	A
EB 24	Passing Zone	0.9	A	0.7	A
EB 25	Passing Constrained	1.0	A	0.8	A
EB 26	Passing Zone	0.8	A	0.7	A
EB 27	Passing Constrained	1.0	A	0.8	A
EB 28	Passing Zone	0.9	A	0.7	A
EB 29	Passing Zone	1.1	A	1.0	A
EB 30	Passing Constrained	1.2	A	1.1	A
EB 31	Passing Zone	1.1	A	0.9	A
EB 32	Passing Constrained	1.2	A	1.1	A
EB 33	Passing Constrained	3.3	B	1.1	A
EB 34	Passing Zone	3.1	B	1.0	A
EB 35	Passing Constrained	3.2	B	1.0	A

TABLE 6: HCM TRAFFIC HIGHWAY OPERATIONS – EXISTING 2022, WESTBOUND SD 38

ID #	Segment Type	AM PEAK HOUR		PM PEAK HOUR	
		Density	LOS	Density	LOS
SD Highway 38 Westbound					
WB 1	Passing Constrained	0.6	A	3.5	B
WB 2	Passing Zone	0.6	A	3.3	B
WB 3	Passing Constrained	0.6	A	3.5	B
WB 4	Passing Zone	0.6	A	1.6	A
WB 5	Passing Constrained	0.6	A	1.5	A
WB 6	Passing Zone	0.6	A	1.6	A
WB 7	Passing Constrained	0.5	A	1.2	A
WB 8	Passing Constrained	0.6	A	1.3	A
WB 9	Passing Zone	0.5	A	1.1	A
WB 10	Passing Constrained	0.6	A	1.3	A
WB 11	Passing Zone	0.5	A	1.2	A
WB 12	Passing Constrained	0.6	A	1.3	A
WB 13	Passing Constrained	0.6	A	1.3	A
WB 14	Passing Constrained	0.6	A	1.5	A
WB 15	Passing Constrained	0.5	A	1.3	A
WB 16	Passing Constrained	1.1	A	4.0	B
WB 17	Passing Constrained	1.0	A	3.8	B
WB 18	Passing Constrained	1.1	A	4.0	B
WB 19	Passing Zone	1.0	A	3.7	B
WB 20	Passing Constrained	1.5	A	5.6	C
WB 21	Passing Constrained	1.5	A	4.3	C
WB 22	Passing Zone	1.4	A	3.9	B
WB 23	Passing Zone	0.2	A	0.7	A
WB 24	Passing Zone	0.2	A	0.6	A
WB 25	Passing Zone	0.2	A	0.5	A
WB 26	Passing Constrained	0.2	A	0.6	A
WB 27	Passing Zone	0.2	A	0.5	A
WB 28	Passing Constrained	0.2	A	0.6	A
WB 29	Passing Constrained	0.3	A	0.6	A
WB 30	Passing Zone	0.2	A	0.5	A
WB 31	Passing Constrained	0.3	A	0.6	A
WB 32	Passing Zone	0.2	A	0.5	A
WB 33	Passing Constrained	0.3	A	0.6	A
WB 34	Passing Zone	0.2	A	0.5	A
WB 35	Passing Constrained	0.3	A	0.6	A

Under the existing conditions, the traffic operations analysis showed acceptable operations at all of the highway segments within the study area, with the majority of segments achieving LOS B or greater during both the AM and PM peak hours. The exception was an approximately 1,500-foot segment of westbound SD 38 (WB 20 and 21), located near the intersection of Mickelson Road/260th Street and downstream of the 50-mph speed transition which resulted in a LOS C during the PM peak hour.

In general, the existing condition traffic operations demonstrated acceptable performance measures throughout all intersections and highway segments within the study area. The desired LOS was realized for all intersections and highway segments during the AM and PM peak hours.

Safety Review

The SDDOT provided historical crash data for the study area. HR Green reviewed crash data for all study intersections within the study limits to determine current crash trends and/or concerns. Crash data was also reviewed for highway segments to determine current crash trends and/or concerns, the SD 38 study corridor was divided into three segments for this review, SD 38 West of Hartford, SD 38 through Hartford and SD 38 East of Hartford. Intersection related crashes are considered as occurring within the study intersection area of influence and segment crashes are those that occurred outside of those intersection limits but within the SD 38 corridor study area. Crashes were analyzed for the five-year period between 2018-2022.

The intersection crash rate per Million Entering Vehicle (MEV) was calculated for the study intersections based on the 2022 traffic volume data provided in the "Existing Traffic Data" section of this report. The SDDOT provided the predicted crash frequency for study intersections and weighted crash rate for study segments. Some intersections were not provided a predicted crash rate due to lack of available minor road ADT. The crash data from SDDOT for the study area can be seen in **Appendix C**.

The following is a summary of the crash history for each study intersection and segment.

Study Intersections

SD Highway 38 & SD Highway 19 / 457th Avenue

- 3 Total Crashes
 - 3 = Property Damage Only
 - 1 = Improper Turn
 - 1 = Ice on the Road
 - 1 = Animal in the Roadway
- Manner of Collision
 - 2 = Non-collision
 - 1 = Angle
- Crash Rate = 0.51 crashes per million entering vehicles
- Average Crash Frequency = 0.60 crashes per year
- Predicted Crashes = 0.54 crashes per year

Crash Experience Legend

- Crash Severity
- Major Cause

Year of Crash

2022	2
2021	1
2020	0
2019	0
2018	0

The crash data showed 3 reported intersection-related crashes at the SD Highway 38 & SD Highway 19 intersection, which were classified as a Property Damage Only incidents. There was no primary cause of crash incidents with each cause of crash incident unique. The causes of the crashes were listed as an Improper Turn, Ice on the Road, and an Animal in the Roadway.

SD Highway 38 & 459th Avenue

- 2 Total Crashes
 - 2 = Property Damage Only
 - 1 = Failed to Yield to Vehicle
 - 1 = Animal in Roadway
- Manner of Collision
 - 1 = Non-collision
 - 1 = Angle
- Crash Rate = 0.33 crashes per million entering vehicles
- Average Crash Frequency = 0.40 crashes per year
- Predicted Crashes = 0.68 crashes per year

<u>Year of Crash</u>	
2022	0
2021	0
2020	0
2019	2
2018	0

The crash data showed 2 reported intersection-related crashes at the SD Highway 38 & 459th Ave intersection, which were classified as Property Damage Only incidents. There was no primary cause of crash incidents with each cause of crash incident unique. The causes of the crashes were listed as Failed to Yield to Vehicle and an Animal in Roadway.

SD Highway 38 & I-90 Speedway

There were no reported crashes within the influence area of this intersection from January 2018 through December 2022. However, a fatal crash had occurred on SD 38 near this intersection and has been listed under the summary for study corridor segments.

SD Highway 38 & Western Avenue / 463rd Avenue

- 7 Total Crashes
 - 1 = Suspected Minor Injury
 - 1 = Failure to Yield to Vehicle
 - 1 = Possible Injury
 - 1 = Failure to Yield to Vehicle
 - 5 = Property Damage Only
 - 2 = Failure to Yield to Vehicle
 - 1 = Followed too Closely
 - 1 = Improper Backing
 - 1 = Road Surface Conditions (Snow/Ice)
- Manner of Collision
 - 2 = Rear-end
 - 4 = Angle
 - 1 = Sideswipe same direction
- Crash Rate = 0.81 crashes per million entering vehicles
- Average Crash Frequency = 1.40 crashes per year
- Predicted Crashes = 1.80 crashes per years

<u>Year of Crash</u>	
2022	2
2021	1
2020	1
2019	0
2018	3

The crash data showed 7 reported intersection-related crashes at the SD Highway 38 & Western Ave / 463rd Ave intersection, with 1 classified as Suspected Minor Injury, 1 classified as Possible Injury, and 5 classified as Property Damage Only. The primary causes of the crash incidents was Failure to Yield to Vehicle (57%), Followed too Closely (14%), Improper Backing (14%), and Road Surface Conditions (14%).

SD Highway 38 & Main Avenue

- 1 Total Crash
 - 1 = Property Damage Only
 - 1 = Failed to Yield to Vehicle
- Manner of Collision
 - 1 = Angle
- Crash Rate = 0.12 crashes per million entering vehicles
- Average Crash Frequency = 0.20 crashes per year
- Predicted Crashes = Not Available

<u>Year of Crash</u>	
2022	0
2021	1
2020	0
2019	0
2018	0

The crash data showed 1 reported intersection-related crashes at the SD Highway 38 & Main Avenue intersection, which was classified as a Property Damage Only incident. The cause of the crash incident was listed as Failure to Yield to Vehicle.

SD Highway 38 & Vandemark Avenue

There were no reported crashes at this intersection from January 2018 through December 2022.

SD Highway 38 & 2nd Street

- 2 Total Crashes
 - 2 = Property Damage Only
 - 1 = Failed to Yield to Vehicle
 - 1 = Followed too Closely
- Manner of Collision
 - 1 = Rear-end
 - 1 = Angle
- Crash Rate = 0.23 crashes per million entering vehicles
- Average Crash Frequency = 0.40 crashes per year
- Predicted Crashes = Not Available

<u>Year of Crash</u>	
2022	0
2021	1
2020	1
2019	0
2018	0

The crash data showed 2 reported intersection-related crashes at the SD Highway 38 & 2nd St intersection, which were classified as a Property Damage Only incidents. There was no primary cause of crash incidents with each cause of crash incident unique. The causes of the crashes were listed as Failed to Yield to Vehicle and Followed too Closely.

SD Highway 38 & West Central High School Entrance

- 2 Total Crashes
 - 1 = Suspected Serious Injury
 - 1 = Drinking
 - 1 = Property Damage Only
 - 1 = Failed to Yield to Vehicle
- Manner of Collision
 - 2 = Angle
- Crash Rate = 0.23 crashes per million entering vehicles
- Average Crash Frequency = 0.40 crashes per year
- Predicted Crashes = Not Available

<u>Year of Crash</u>	
2022	0
2021	1
2020	0
2019	1
2018	0

The crash data showed 2 reported intersection-related crashes at the SD Highway 38 & West Central High School Entrance intersection, which were classified as a Property Damage Only incident and a Suspected Serious Injury

incident. There was no primary cause of crash incidents with each cause of crash incident unique. The causes of the crashes were listed as Failed to Yield to Vehicle, and Drinking.

SD Highway 38 & Railroad Street / 464th Avenue

- 2 Total Crashes
 - 1 = Suspected Serious Injury
 - 1 = Ran off Road
 - Property Damage Only
 - 1 = Distracted
- Manner of Collision
 - 1 = Non-collision
- Crash Rate = 0.22 crashes per million entering vehicles
- Average Crash Frequency = 0.40 crashes per year
- Predicted Crashes = 1.79 crashes per years

<u>Year of Crash</u>	
2022	0
2021	1
2020	0
2019	1
2018	0

The crash data showed 2 reported intersection-related crashes at the SD Highway 38 & Railroad Street / 464th Ave intersection, which were classified as a Property Damage Only incident and a Suspected Serious Injury incident. There was no primary cause of crash incidents with each cause of crash incident unique. The causes of the crashes were listed as Distracted Driving, and Ran off Road.

SD Highway 38 & Mickelson Road / 260th Street

There were no reported crashes at this intersection from January 2018 through December 2022.

SD Highway 38 & 466th Avenue (North Intersection)

- 2 Total Crashes
 - 1 = Suspected Minor Injury
 - 1 = Drinking
 - 1 = Property Damage Only
 - 1 = Followed Too Closely
- Manner of Collision
 - 1 = Non-collision
 - 1 = Rear-end
- Crash Rate = 0.23 crashes per million entering vehicles
- Average Crash Frequency = 0.40 crashes per year
- Predicted Crashes = Not Available

<u>Year of Crash</u>	
2022	0
2021	0
2020	1
2019	0
2018	1

The crash data showed 2 reported intersection-related crashes at the SD Highway 38 & 466th Avenue (North) intersection, which was classified as a Property Damage Only incident and Suspected Serious Injury incident. There was no primary cause of crash incidents with each cause of crash incident unique. The causes of the crashes were listed as Followed Too Closely, and Drinking.

SD Highway 38 & WB I-90 Exit 390

- 4 Total Crashes
 - 2 = Possible Injury
 - 1 = Drinking
 - 1 = Failure to Yield to Vehicle
 - 2 = Property Damage Only
 - 1 = Distracted
 - 1 = Followed Too Closely
- Manner of Collision
 - 1 = Non-collision
 - 3 = Rear-end
- Crash Rate = 0.46 crashes per million entering vehicles
- Average Crash Frequency = 0.80 crashes per year
- Predicted Crashes = Not Available

<u>Year of Crash</u>	
2022	1
2021	0
2020	0
2019	2
2018	1

The crash data showed 4 reported intersection-related crashes at the SD Highway 38 & WB I-90 Exit 390 intersection, which were classified as a Property Damage Only and Possible Injury. There was no primary cause of crash incidents with each cause of crash incident unique. The causes of the crashes were listed as Distracted driving, Followed Too Closely, Drinking, and Failure to Yield to Vehicle.

SD Highway 38 & EB I-90 Exit 390

There were no reported crashes at this intersection from January 2018 through December 2022.

SD Highway 38 & 466th Avenue (South Intersection)

- 1 Total Crashes
 - 1 = Property Damage Only
 - 1 = Failure to Yield to Vehicle
- Manner of Collision
 - 1 = Angle
- Crash Rate = 0.12 crashes per million entering vehicles
- Average Crash Frequency = 0.20 crashes per year
- Predicted Crashes = Not Available

<u>Year of Crash</u>	
2022	0
2021	0
2020	0
2019	1
2018	0

The crash data showed 1 reported intersection-related crashes at the SD Highway 38 & 466th Avenue (South) intersection, which was classified as a Property Damage Only incident. The cause of the crash incident was listed as Failure to Yield to Vehicle.

SD Highway 38 & County Highway 141 / 468th Avenue

- 2 Total Crashes
 - 1 = Suspected Serious Injury
 - 1 = Disregard Traffic Signs
 - 1 = Suspected Minor Injury
 - 1 = Ice on Roadway
- Manner of Collision
 - 1 = Non-collision
 - 1 = Angle
- Crash Rate = 0.23 crashes per million entering vehicles
- Average Crash Frequency = 0.40 crashes per year
- Predicted Crashes = 1.39 crashes per years

<u>Year of Crash</u>	
2022	1
2021	1
2020	0
2019	0
2018	0

The crash data showed 2 reported intersection-related crashes at the SD Highway 38 & 468th Avenue intersection, which were classified as Suspected Serious Injury and Suspected Minor Injury. There was no primary cause of crash incidents with each cause of crash incident unique. The causes of the crashes were listed as Ice on the Roadway, and Disregarding Traffic Signs.

SD Highway 38 & County Highway 139 / 469th Avenue

- 3 Total Crashes
 - 1 = Suspected Minor Injury
 - 1 = Driving too Fast for Conditions
 - 2 = Property Damage Only
 - 1 = Animal in the Roadway
 - 1 = Improper Turn
- Manner of Collision
 - 1 = Non-collision
 - 2 = Angle
- Crash Rate = 0.35 crashes per million entering vehicles
- Average Crash Frequency = 0.60 crashes per year
- Predicted Crashes = 2.02 crashes per years

<u>Year of Crash</u>	
2022	0
2021	0
2020	1
2019	1
2018	1

The crash data showed 3 reported intersection-related crashes at the SD Highway 38 & 469th Ave intersection, with 2 classified as Property Damage Only incidents, and 1 classified as Suspected Minor Injury. There was no primary cause of crash incidents with each cause of crash incident unique. The causes of the crashes were listed as Driving too Fast for Conditions, Animal in the Roadway, and Improper Turn.

SD Highway 38 & La Mesa Drive / 470th Avenue

- 3 Total Crashes
 - 1 = Fatal
 - 1 = Disregarded Traffic Signs
 - 2 = Property Damage Only
 - 1 = Improper Backing
 - 1 = Improper Turn
- Manner of Collision
 - 1 = Rear-end
 - 2 = Angle
- Crash Rate = 0.19 crashes per million entering vehicles

<u>Year of Crash</u>	
2022	0
2021	0
2020	2
2019	0
2018	1

- Average Crash Frequency = 0.60 crashes per year
- Predicted Crashes = 2.62 crashes per years

The crash data showed 3 reported intersection-related crashes at the SD Highway 38 & La Mesa intersection, with 2 classified as Property Damage Only incidents, and 1 Fatal incident. There was no primary cause of crash incidents with each cause of crash incident unique. The causes of the crashes were listed as Disregarded Traffic Signs, Improper Backing, and Improper Turn.

The fatal crash incident occurred on December 26, 2020, at approximately 7:30 AM, when a southbound vehicle failed to stop at the stop sign and was struck by an eastbound vehicle. The pavement conditions were reported as dry and adverse weather was not listed as a contributing factor. This crash resulted in a single occupant fatality and single occupant injury.

SD Highway 38 & Marion Road

- 14 Total Crashes
 - 3 = Suspected Minor Injury
 - 1 = Drinking
 - 1 = Failure to Yield to Vehicle
 - 1 = Disregarded Traffic Signs or Signal
 - 4 = Possible Injury
 - 2 = Disregarded Traffic Signs or Signal
 - 1 = Followed too Closely
 - 1 = Illness
 - 7 = Property Damage Only
 - 2 = Failure to Yield to Vehicle
 - 2 = Disregard Traffic Signs or Signals
 - 1 = Improper Lane Change
 - 1 = Driving too Fast for Conditions
 - 1 = Distracted

<u>Year of Crash</u>	
2022	3
2021	3
2020	2
2019	1
2018	5

- Manner of Collision
 - 1 = Non-collision
 - 5 = Rear-end
 - 7 = Angle
 - 1 = Sideswipe, same direction
- Crash Rate = 0.79 crashes per million entering vehicles
- Average Crash Frequency = 2.80 crashes per year
- Predicted Crashes = 1.56 crashes per years

The crash data showed 14 reported intersection-related crashes at the SD Highway 38 & Marion Road intersection, with 7 classified as Property Damage Only incidents, 4 Possible Injury incidents, and 3 Suspected Injury incidents. The primary causes of the crashes were determined to be Disregarded Traffic Signs or Signal (27%) and Failure to Yield to Vehicle (20%).

Study Corridor Segments

SD Highway 38 Corridor Segments West of Hartford

- 50 Total Crashes
 - 2 = Fatal
 - 1 = Failure to Yield to Vehicle
 - 1 = Snowmobile in the roadway
 - 1 = Suspected Serious Injury

<u>Year of Crash</u>	
2022	9
2021	10
2020	18
2019	6
2018	7

- 1 = Running off the Road
- 1 = Suspected Minor Injury
 - 1 = Distracted
- 3 = Possible Injury
 - 1 = Wrong side or Wrong Way
 - 1 = Followed Too Closely
 - 1 = Driving too Fast for Conditions
- 43 = Property Damage Only
 - 30 = Animal in the Roadway
 - 1 = Failure to Yield to Vehicle
 - 2 = Improper Passing
 - 2 = Followed too Closely
 - 1 = Failure to Keep Proper Lane
 - 1 = Swerving or Avoiding
 - 1 = Distracted
 - 1 = Object in Roadway
 - 2 = Weather Conditions
 - 1 = Running off the Road
 - 1 = Unsecured Ratchet Strap
- Manner of Collision
 - 36 = Non-collision
 - 7 = Rear-end
 - 3 = Angle
 - 2 = Sideswipe, Same direction
 - 2 = Sideswipe, opposite direction
- Statewide Average Crash Rate = 1.73 crashes per 100 million vehicle miles traveled
- Weighted Crash Rate = 1.86 crashes per 100 million vehicle miles traveled

The crash data showed 50 reported corridor-related crashes along SD Highway 38 with 43 classified as Property Damage Only incidents, 3 Possible Injury incidents, 1 Suspected Injury incident, 1 Suspected Serious Injury incident, and 2 Fatal incidents. The primary cause of the corridor crashes was determined to be Animal in the Roadway which contributed to 60% of crashes. Following Too Closely and Failure to Yield to a Vehicle were listed as the two most frequent driver contributed circumstances.

A fatal crash incident occurred near mile marker 353, on August 29, 2020, at approximately 6:45 PM, when an eastbound vehicle stopped in the travel lane to complete a left turn and was rear-ended by an eastbound motorcyclist. The pavement conditions were reported as dry and adverse weather was not listed as a contributing factor. This crash resulted in a single occupant fatality.

A fatal crash incident occurred near mile marker 355, on December 17, 2022, at approximately 6:35 PM, when a westbound vehicle struck a snowmobile and occupant who was in the roadway. The pavement conditions were reported as snow covered which may have been a contributing factor. This crash resulted in a single occupant fatality.

SD Highway 38 Corridor Segments in Hartford

- 16 Total Crashes
 - 3 = Possible Injury
 - 1 = Followed too Closely
 - 1 = Fatigue/Asleep
 - 1 = Run off Road
 - 13 = Property Damage Only
 - 6 = Animal in Roadway
 - 2 = Followed too Closely
 - 2 = Driving too Fast for Conditions
 - 1 = Failure to Yield to Vehicle
 - 1 = Running off Road
 - 1 = Vehicle Fire
- Manner of Collision
 - 10 = Non-collision
 - 5 = Rear-end
 - 1 = Sideswipe, opposite direction
- Statewide Average Crash Rate = 1.73 crashes per 100 million vehicle miles traveled
- Weighted Crash Rate = 0.33 to 1.88 crashes per 100 million vehicle miles traveled

<u>Year of Crash</u>	
2022	4
2021	4
2020	1
2019	1
2018	6

The crash data showed 16 reported corridor-related crashes along SD Highway 38, with 13 classified as Property Damage Only incidents, and 3 Possible Injury incidents. The primary cause of crashes was determined to be Animal in the Roadway which contributed to 35% of crashes. Following Too Closely and Driving Too Fast for Conditions were listed as the two most frequent driver contributed circumstances.

SD Highway 38 Corridor Segments East of Hartford

- 57 Total Crashes
 - 1 = Fatal Injury
 - 1 = Wrong Side or Wrong Way
 - 4 = Suspected Serious Injury
 - 1 = Running off Road
 - 1 = Failure to Keep Proper Lane
 - 1 = Failure to Yield to Vehicle
 - 1 = Illness
 - 4 = Suspected Minor Injury
 - 1 = Improper Passing
 - 2 = Drinking
 - 1 = Followed Too Closely
 - 4 = Possible Injury
 - 1 = Followed too Closely
 - 1 = Swerving or Avoiding
 - 1 = Run off Road
 - 1 = Failure to Keep Proper Lane
 - 44 = Property Damage Only
 - 27 = Animal in Roadway
 - 1 = Driving too Fast for Conditions

<u>Year of Crash</u>	
2022	9
2021	15
2020	11
2019	14
2018	8

- 1 = Improper Passing
- 5 = Followed too Closely
- 1 = Failure to Keep Proper Lane
- 1 = Running off Road
- 1 = Over-Correcting/Over-Steering
- 1 = Fatigued/Asleep
- 2 = Drinking
- 1 = Distracted
- 2 = Objects in Roadway
- 1 = Equipment Malfunction
- Manner of Collision
 - 40 = Non-collision
 - 9 = Rear-end
 - 1 = Head-on
 - 2 = Angle
 - 3 = Sideswipe, same direction
 - 2 = Sideswipe, opposite direction
- Statewide Average Crash Rate = 1.73 crashes per 100 million vehicle miles traveled
- Weighted Crash Rate = 0.21 to 1.97 crashes per 100 million vehicle miles traveled

The crash data showed 57 reported corridor-related crashes along SD Highway 38 with 44 classified as Property Damage Only incidents, 4 Possible Injury incidents, 4 Suspected Injury incident, 4 Suspected Serious Injury incident, and 1 Fatal incident. The primary cause of crashes was determined to be Animal in the Roadway which contributed to 47% of crashes. Following Too Closely and Drinking were listed as the two most frequent driver contributed circumstances.

The fatal crash incident occurred on February 17, 2021, at approximately 7:50 AM, when an eastbound vehicle crossed into the opposing lane and was struck by a westbound vehicle. The pavement conditions were reported as snow covered which may have been a contributing factor. This crash resulted in a single occupant fatality.

Crash Summary

Overall, there was a total of 171 crashes that occurred within the SD 38 study area. Of these incidents, there were 4 Fatal incidents (2%), 37 Injury incidents (22%), and 130 Property Damage Only incidents (76%). The majority of crashes were classified as Non-Collision incidents (57%), followed by Rear-End (20%) and Angle incidents (15%). The SD 38 study segments contained 123 (72%) crash incidents and the study intersections contained 48 (28%) crash incidents. The crash summary by manner of collision can be seen in **Table 7** and **Table 8** for the intersection related crashes and segment crashes, respectively. The crash summary by injury severity can be seen in **Table 9** and **Table 10** for the intersection related crashes and segment crashes, respectively.

The intersection with the highest rate of crash frequency was the SD Highway 38 & Marion Road intersection with 14 (30%) of the total intersection crash instances. The segment of SD 38 east of Hartford had the highest frequency of corridor crashes with 57 (46%) of the total corridor segment crash instances.

The main driver contributing circumstances that resulted in fatal and injury crash severity incidents within the study area included Drinking (20%), Failure to yield to vehicle (17%), Disregard of traffic signs or signals (13%), or some form of roadway/lane departure (20%).

There were 2 fatal crash instances that had occurred west of Hartford and 2 fatal crash instances that had occurred east of Hartford during the study period. Each fatal crash had its own unique circumstances that contributed to the event. However, intersection control and roadway geometry modifications may reduce the potential for future crash occurrences.

The crash summary by manner of collision can be seen in **Table 7** and **Table 8** for the study intersection related crashes and segment crashes, respectively. It should be noted that several minor intersections not previously identified for study focus were included in the crash analysis of segments.

TABLE 7: SD 38 INTERSECTION MANNER OF CRASH

SD Highway 38 Intersection	Total Crashes	Non collision	Rear-end	Head-on	Angle	Sideswipe, same direction	Sideswipe, opposite direction
SD Highway 19 / 457th Avenue	3	2	0	0	1	0	0
459 th Avenue	2	1	0	0	1	0	0
I-90 Speedway Entrance	0	0	0	0	0	0	0
Western Avenue / 463rd Avenue	7	0	2	0	4	1	0
Main Avenue	1	0	0	0	1	0	0
Vandemark Avenue	0	0	0	0	0	0	0
2nd Street	2	0	1	0	1	0	0
West Central High School Entrance	2	0	0	0	2	0	0
Railroad Street / 464th Avenue	2	1	0	0	0	1	0
Mickelson Road/260th Street	0	0	0	0	0	0	0
466th Avenue (North)	2	1	1	0	0	0	0
WB I-90 Exit 390	4	1	3	0	0	0	0
EB I-90 Exit 390	0	0	0	0	0	0	0
466 th Avenue (South)	1	0	0	0	1	0	0
County Highway 141 / 468th Avenue	2	1	0	0	1	0	0
County Highway 139 / 469th Avenue	3	1	0	0	2	0	0
La Mesa Drive / 470th Avenue	3	0	1	0	2	0	0
Marion Road	14	1	5	0	7	1	0
TOTALS	48	9	13	0	23	3	0

TABLE 8: SD 38 SEGMENT MANNER OF CRASH

SD Highway 38 Segment	Total Crashes	Non collision	Rear-end	Head-on	Angle	Sideswipe, same direction	Sideswipe, opposite direction
Humboldt to Hartford	50	36	7	0	3	2	2
Within Hartford	16	10	5	0	0	0	1
Hartford to Sioux Falls	57	40	9	1	2	3	2
TOTALS	123	86	21	1	5	5	5

The majority of crashes at study intersections were categorized as Rear-End (27%) or Angle (48%) manner of collision. The majority of crashes along highway segment were categorized as Non-Collision (70%) and Rear-End (17%) manner of collisions.

TABLE 9: SD 38 INTERSECTION CRASH SEVERITY

SD Highway 38 Intersection	Total Crashes	Fatal Incidents	Serious Injury Incidents	Minor Injury Incidents	Possible/Unknown Incidents	PDO Incidents	Average Crash Frequency	Predicted Crash Frequency
SD Highway 19 / 457th Avenue	3	0	0	0	0	3	0.60	0.54
459 th Avenue	2	0	0	0	0	2	0.40	0.68
I-90 Speedway Entrance	0	0	0	0	0	0	0.00	NA
Western Avenue / 463rd Avenue	7	0	0	1	1	5	1.40	1.80
Main Avenue	1	0	0	0	0	1	0.20	NA
Vandemark Avenue	0	0	0	0	0	0	0.00	NA
2nd Street	2	0	0	0	0	2	0.40	NA
West Central High School Entrance	2	0	1	0	0	1	0.40	NA
Railroad Street / 464th Avenue	2	0	1	0	0	1	0.40	1.79
Mickelson Road/260th Street	0	0	0	0	0	0	0.00	NA
466th Avenue (North)	2	0	0	1	0	1	0.40	NA
WB I-90 Exit 390	4	0	0	0	2	2	0.80	NA
EB I-90 Exit 390	0	0	0	0	0	0	0.00	NA
466 th Avenue (South)	1	0	0	0	0	1	0.20	NA
County Highway 141 / 468th Avenue	2	0	1	1	0	0	0.40	1.39
County Highway 139 / 469th Avenue	3	0	0	1	0	2	0.60	2.02
La Mesa Drive / 470th Avenue	3	1	0	0	0	2	0.60	2.62
Marion Road	14	0	0	3	4	7	2.80	1.56

NOTE: RED INDICATES A FATALITY OR CRASH RATE ABOVE EXPECTATIONS

TABLE 10: SD 38 SEGMENT CRASH SEVERITY

SD Highway 38 Segment	Total Crashes	Fatal Incidents	Serious Injury Incidents	Minor Injury Incidents	Possible/Unknown Incidents	PDO Incidents	Weighted Crash Rate	Statewide Average Crash Rate
Humboldt to Hartford	50	2	1	1	3	43	1.86	1.73
Within Hartford	16	0	0	0	3	13	0.33-1.88	1.73
Hartford to Sioux Falls	57	1	4	4	4	44	0.21-1.97	1.73

NOTE: RED INDICATES A FATALITY OR CRASH RATE ABOVE EXPECTATIONS

The majority of intersections had lower observed crash frequency than the predicted crash frequency. However, the SD 38 & SD 19 and the SD 38 & Marion Road intersections had an average five-year crash frequency that was above the predicted crash frequency. According to data provided by SDDOT, the SD 38 highway segments as a whole had a weighted crash rate of 3.45 which exceeded the statewide average of 1.73 for rural minor arterials for the period ending in 2020. SDDOT weighted crash rates can be seen in **Appendix C**.

The SDDOT has officially adopted the safety targets presented in the South Dakota Highway Safety Plan and identified safety targets for number of fatalities, rate of fatal incidents, number of serious injuries, and rate of serious

injury incidents. The 2023 targets for safety performance measures established by SDDOT have been endorsed by the Sioux Falls Area MPO. The MPO has resolved to plan and program projects that contribute to the accomplishments of these safety performance goals. The safety performance goals are presented in **Table 11** along with the values calculated within the SD 38 study area.

TABLE 11: ESTABLISHED SAFETY PERFORMANCE GOALS

South Dakota DOT / Sioux Falls MPO Safety Performance Goals	Target Goal	SD38 Corridor Value
Number of Fatalities	122.7	4.0
Rate of Fatalities per HMVMT	1.20	4.1
Number of Serious Injuries	635.9	6.0
Rate of Serious Injuries per HMVMT	6.22	8.1
Number of Non-Motorized Fatalities and Serious Injuries	40.0	0.0

NOTE: RED INDICATES A VALUE ABOVE TARGET GOAL

TOTAL INJURY NUMBERS AND CRASH RATES ARE STATEWIDE GOALS.

The number of crash instances within the study area were evaluated and crash rates for fatal and serious injury incidents were calculated. Using the most recent 5-year crash history, the SD 38 study area had a fatal crash rate of 4.1 crashes per hundred million vehicle miles traveled (HMVMT) which exceeded the safety target fatal crash rate of 1.20 crashes per HMVMT and a serious injury crash rate of 8.1 crashes per HMVMT which exceeded the safety target serious injury crash rate of 1.20 crashes per HMVMT.

A depiction of the crash frequency along the SD Highway 38 corridor can be seen in **Figure 7** with higher frequency crash locations appearing in red. The fatal and major/minor injury incidents can be seen in **Figure 8**. The SD38 highway segment weight average crash rates can be seen in **Figure 9**.



Highway 38 Analysis

Crash Frequency Map

FIGURE 7

Legend





Highway 38 Analysis

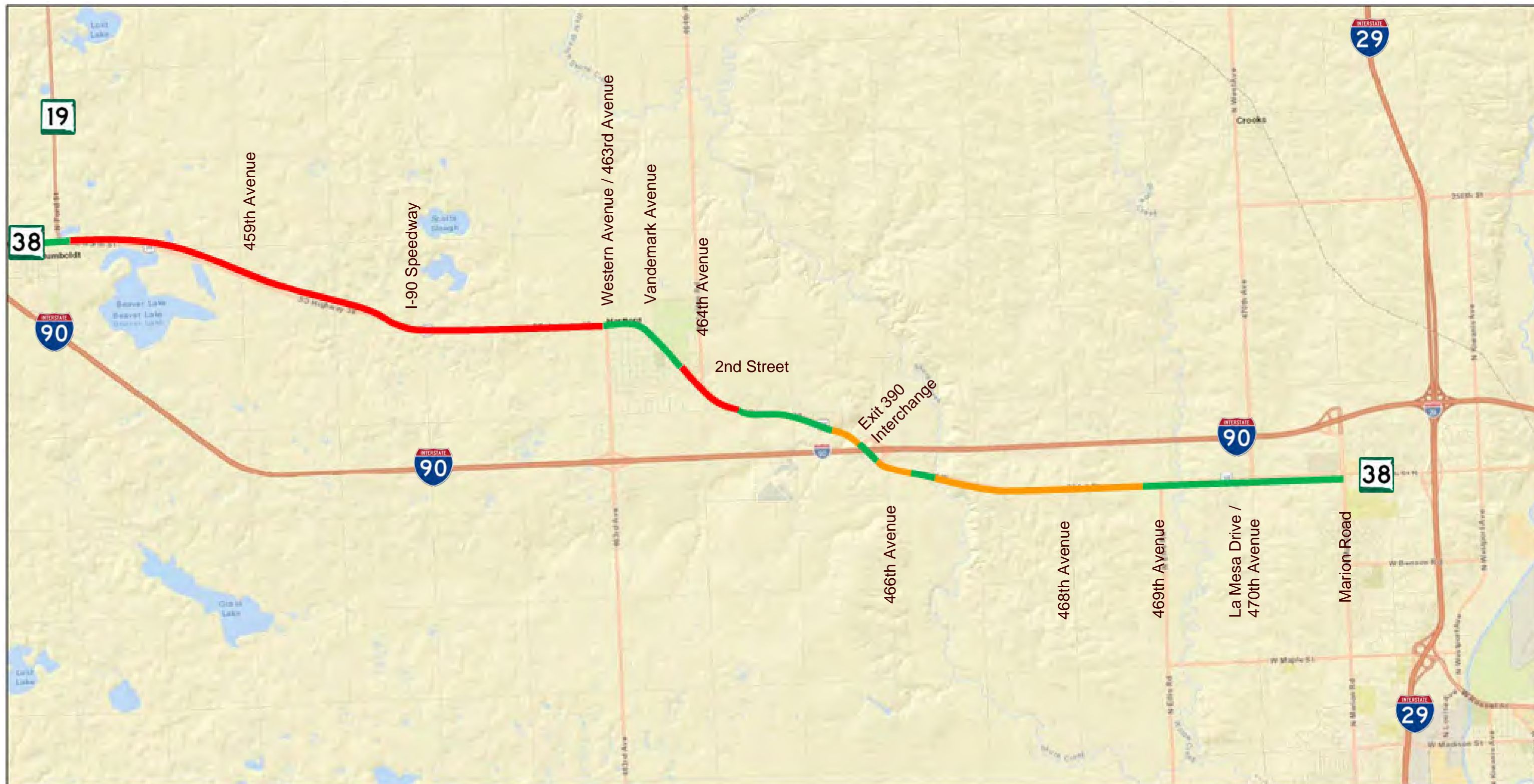
Crash Severity Map

FIGURE 8

Legend

- Crash Severity**
- K - Fatal
 - A - Suspected Serious Injury
 - B - Suspected Minor Injury

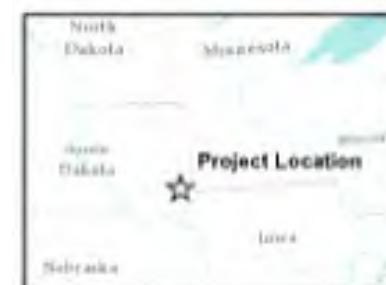
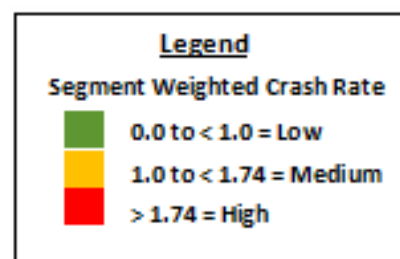




Highway 38 Analysis Segments

Weighted Crash Rate Map

FIGURE 9



Summary

The purpose of this technical memorandum is to document the existing conditions traffic assessment at the eighteen study intersections and associated highway corridor segments along the SD Highway 38 corridor, from the SD Highway 19 intersection in Humboldt, South Dakota to the Marion Road intersection in Sioux Falls, South Dakota.

The existing conditions traffic assessment included the review of traffic volume data at the eighteen study intersections along the study corridor and determination of peak hour traffic volumes. The traffic volume data collection revealed that the peak hours of traffic along the corridor were generally from 7:15-8:15 AM and 4:45-5:45 PM. Using the established traffic volumes, the traffic operations at intersection and along the two-lane highway were evaluated. It was determined that all intersections and highway segment represented acceptable LOS.

The crash history was reviewed at the study intersections and compared to the predicted crashes per year. It was determined that the SD 38 & SD 19 and the SD 38 & Marion Road intersections experienced an average crash frequency higher than the predicted number of crashes per year. The study intersections represented 1 fatal incident, 3 major injury incidents, and 7 minor injury incidents. The majority of intersection crashes were categorized as Rear-end or Angle manner of crash. The primary causes of these crashes was determined to be Followed Too Closely and Failure to Yield to Vehicle.

The crash history was reviewed at the study highway segments and it was determined that the SD Highway 38 corridor had a weighted crash rate of 3.45 which is higher than the statewide average crash rate of 1.73 for rural minor arterials. The study highway segments represented 3 fatal incidents, 5 major injury incidents, and 5 minor injury incidents. The highway segment east of Hartford had the highest frequency of crash instances with 57 recorded crashes (45.9%). The majority of crashes along highway segments were the result of vehicle-animal strikes with 63 instances recorded (51%). Other contributing causes of crash instances were Followed Too Closely, Failure to Keep in Proper Lane, and Running Off Road.

It was further determined that the current fatal crash rate and serious injury crash rate along the SD 38 study corridor was above the safety performance targets established by the SDDOT and endorsed by the Sioux Falls Area MPO.

The existing year traffic volumes established in this report will be the basis for future year traffic projections and traffic capacity analysis studies in subsequent phases of this project.

Appendix A – Traffic Data
Pedestrian Crosswalks at Study Intersections

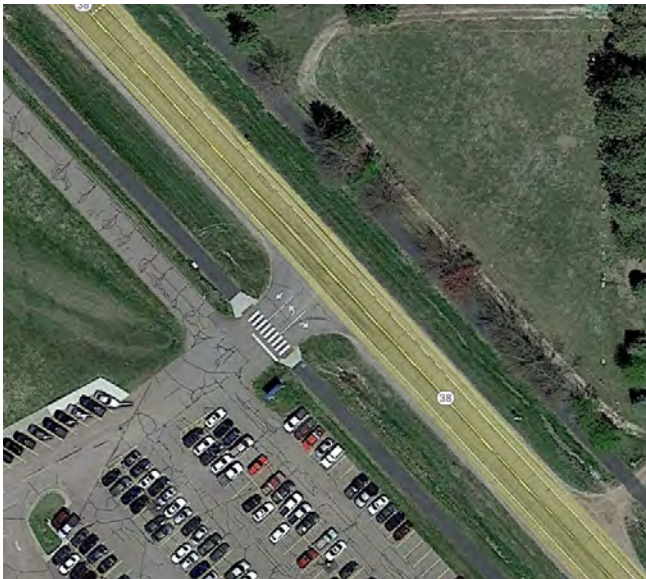
SD 38 & Vandemark Avenue



SD 38 & 2nd Street



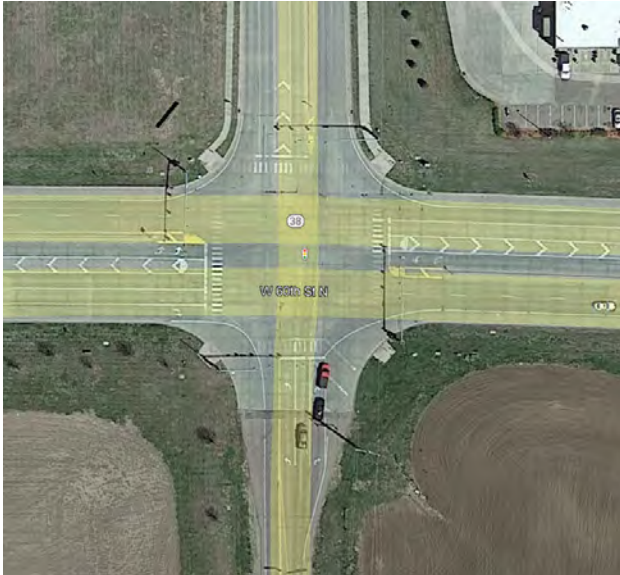
SD 38 & West Central High School Entrance



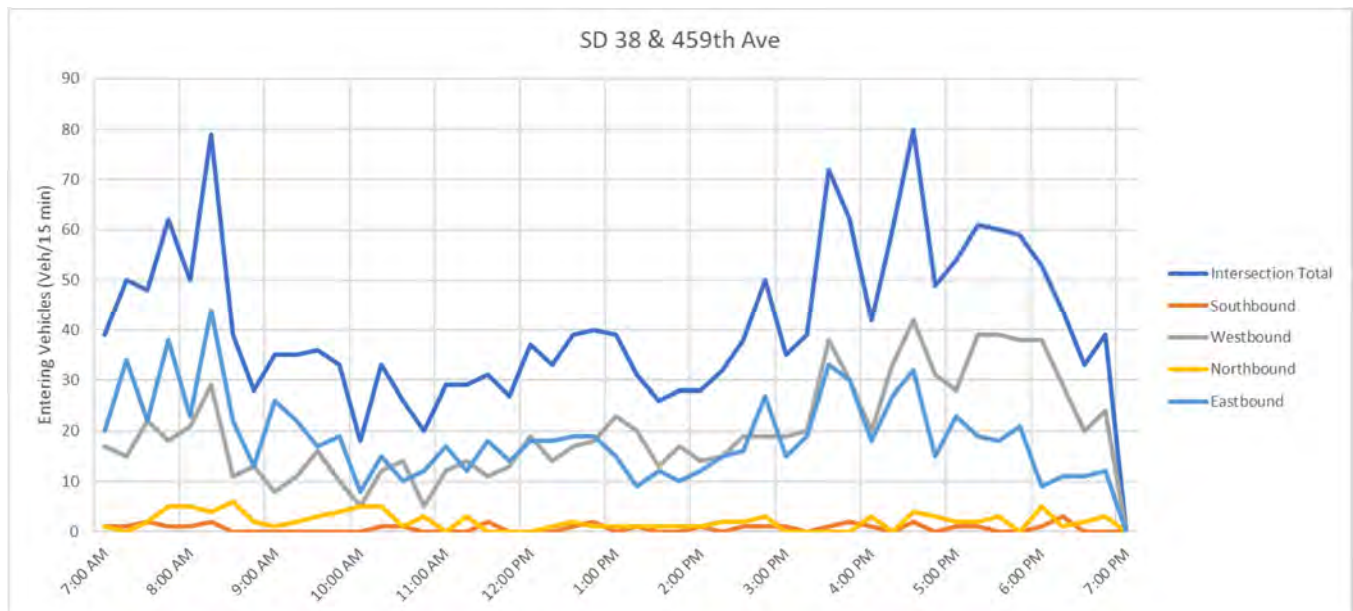
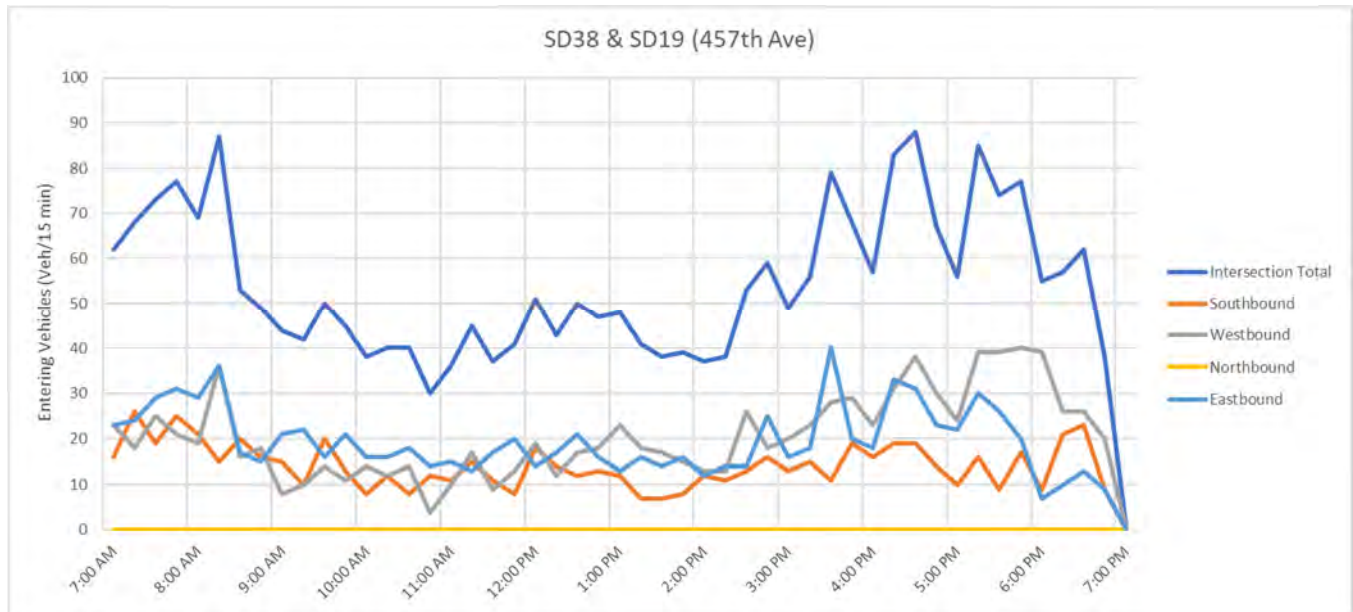
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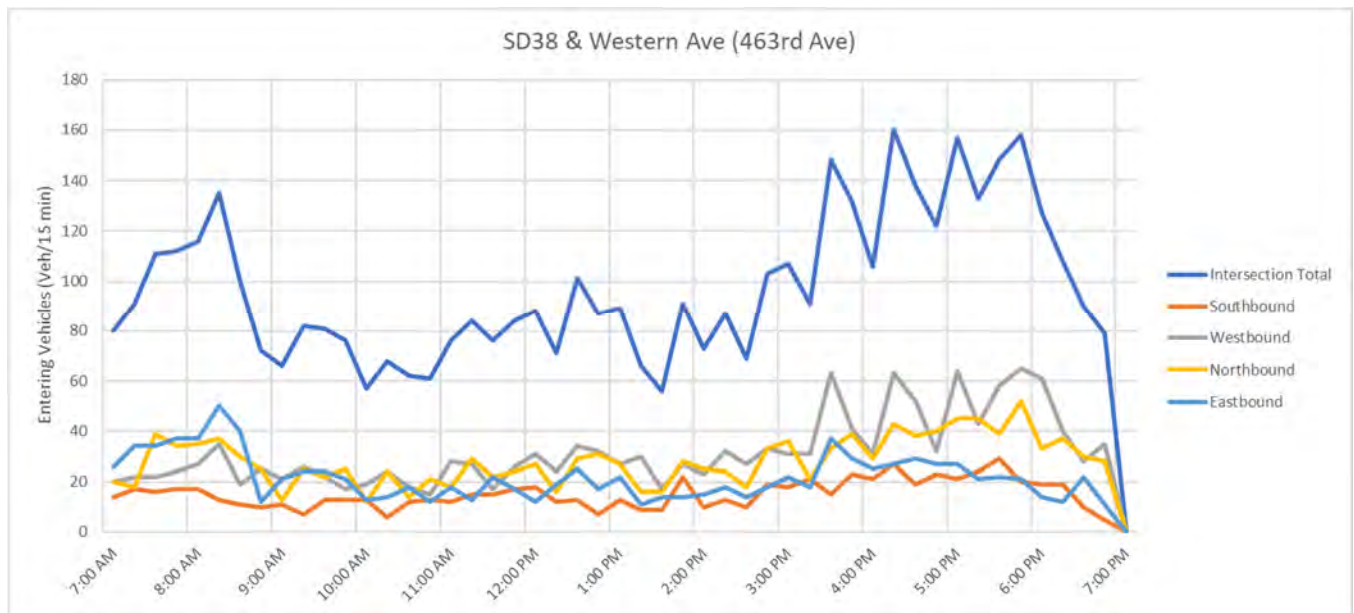
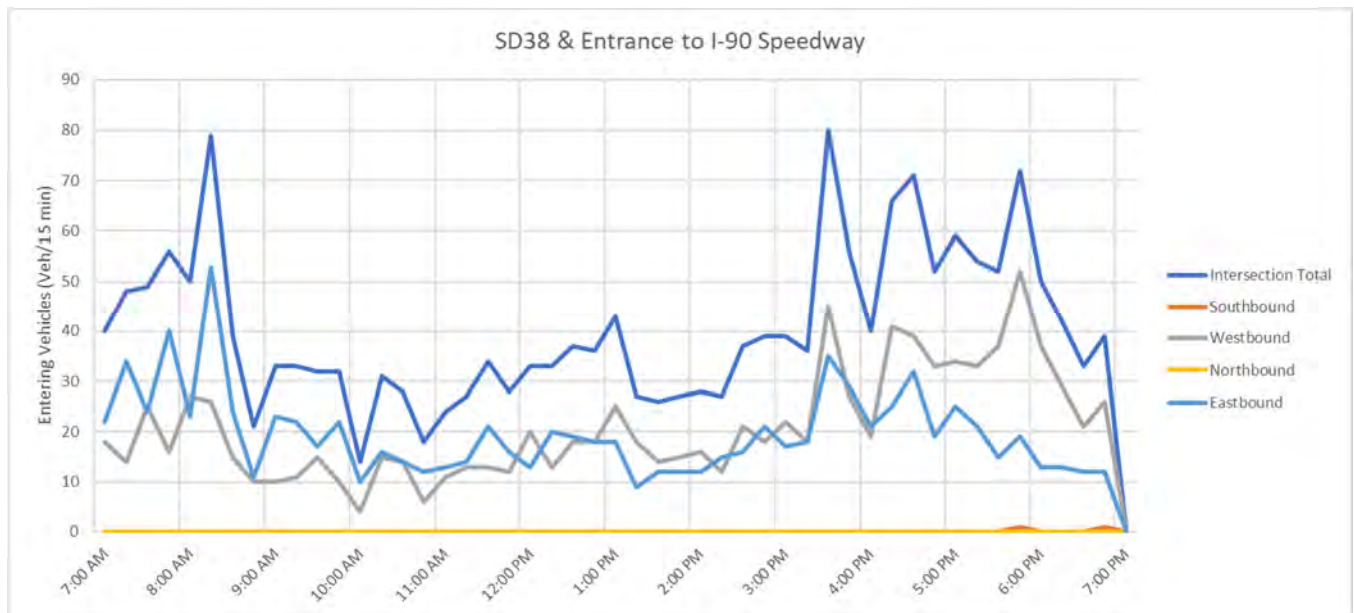


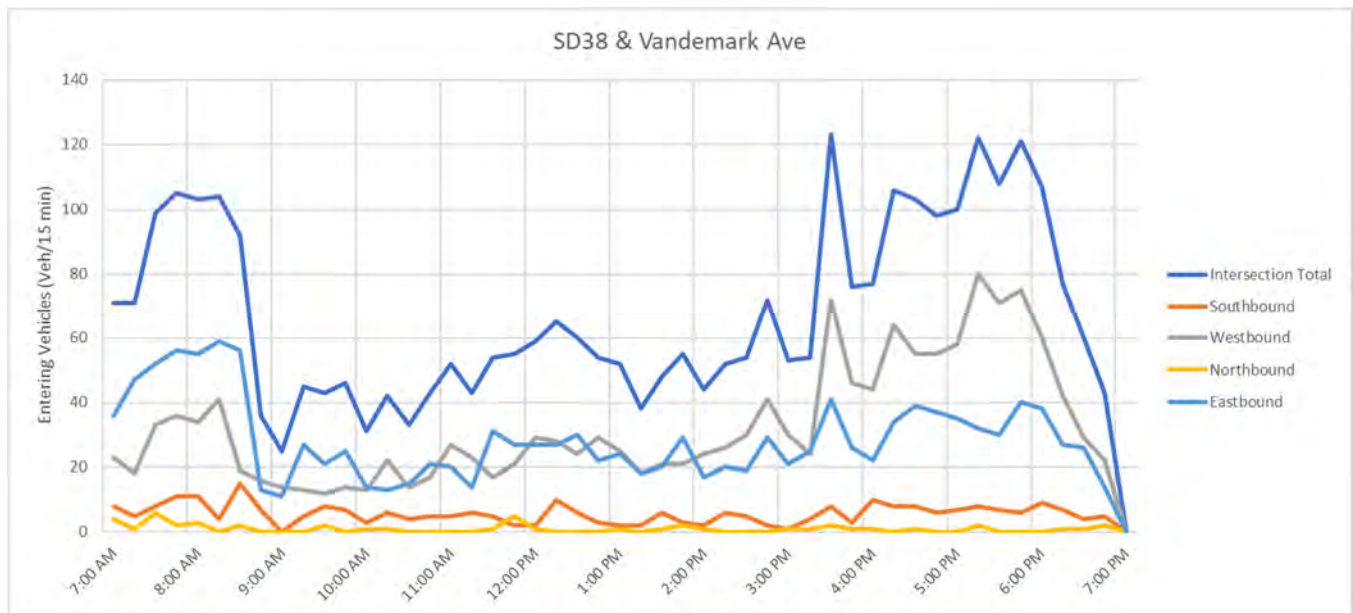
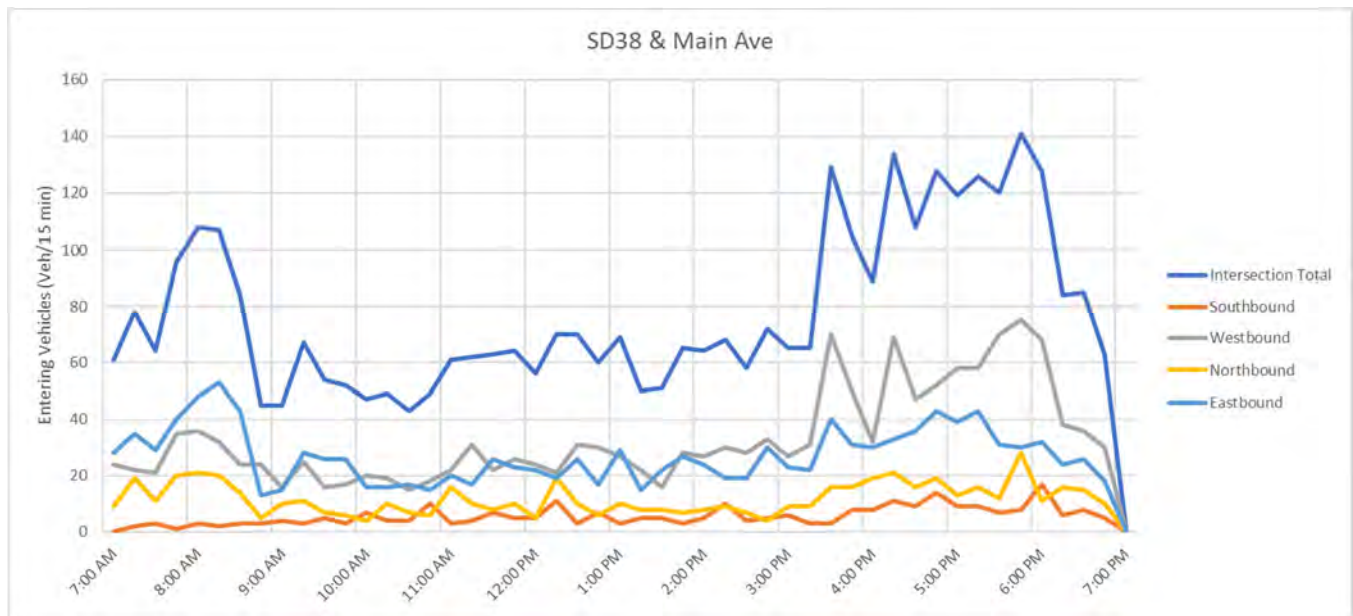
SD 38 & Marion Road

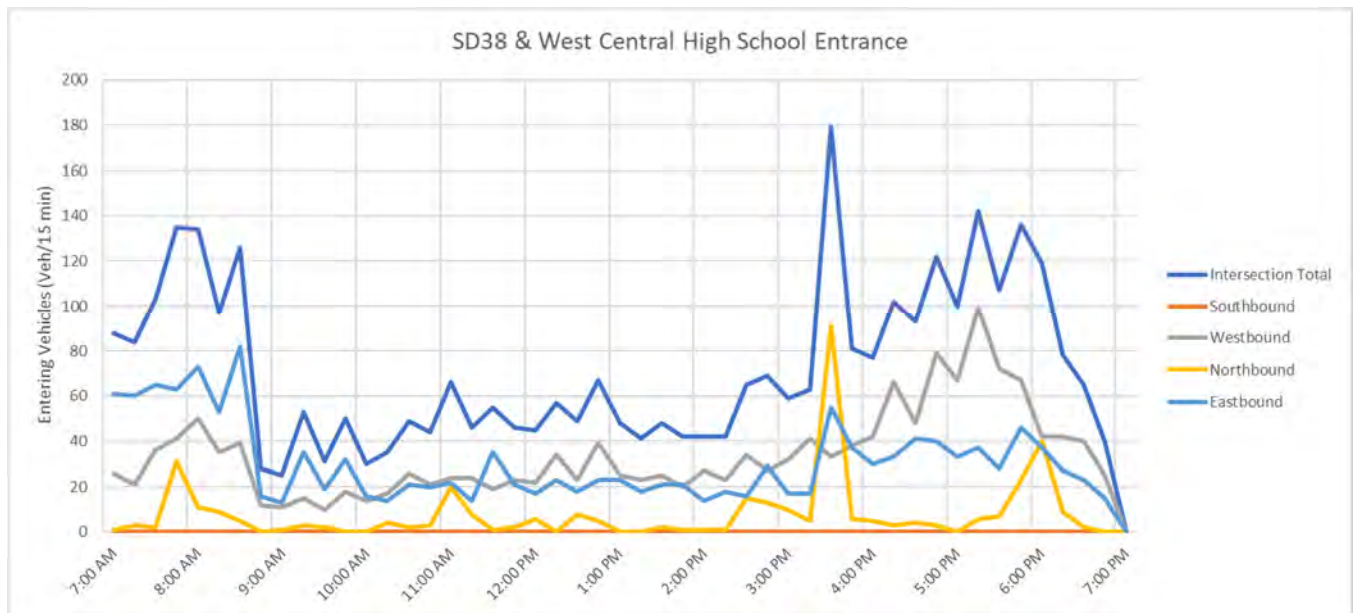
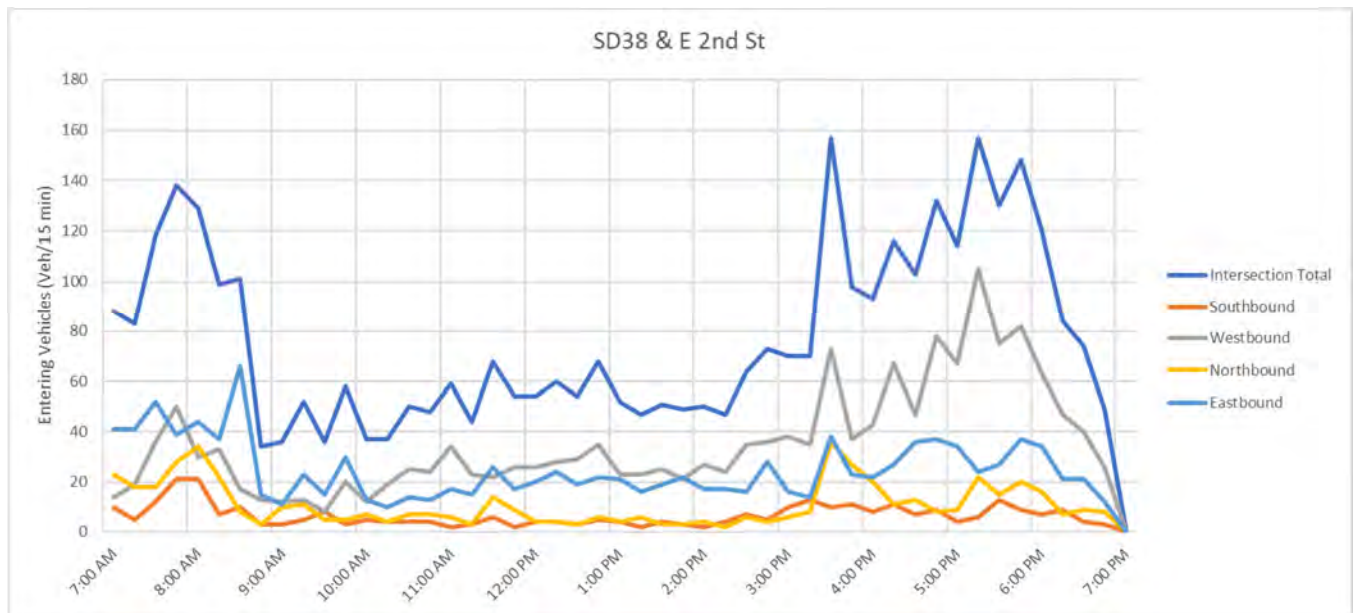


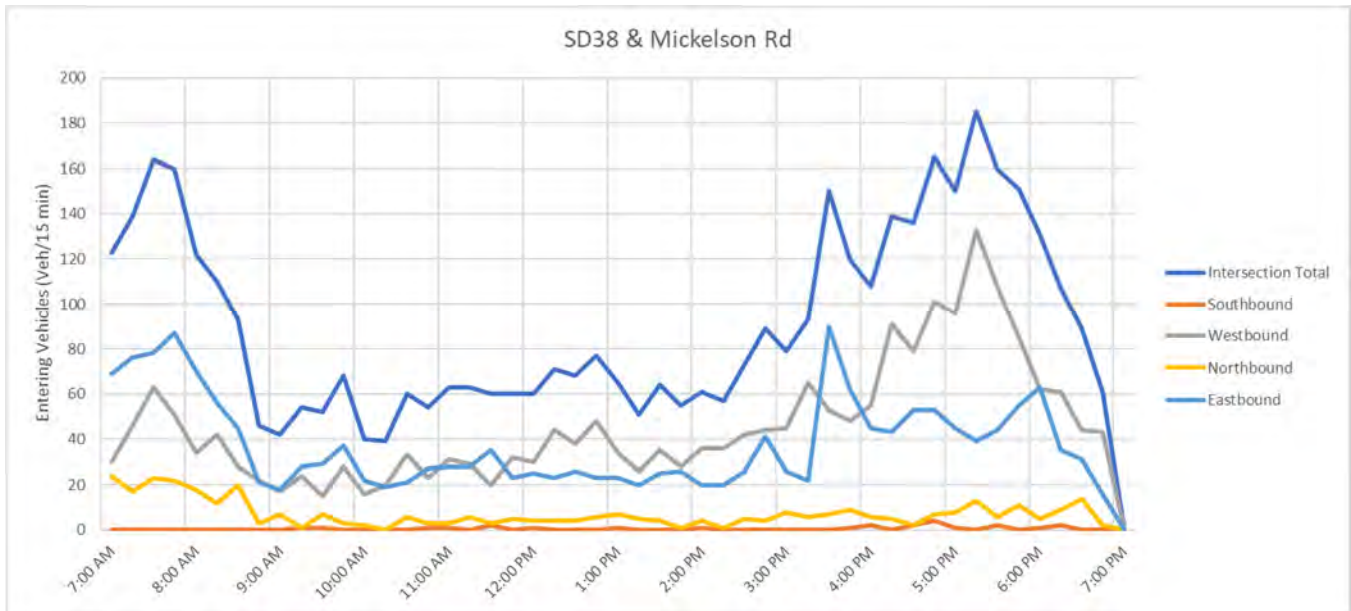
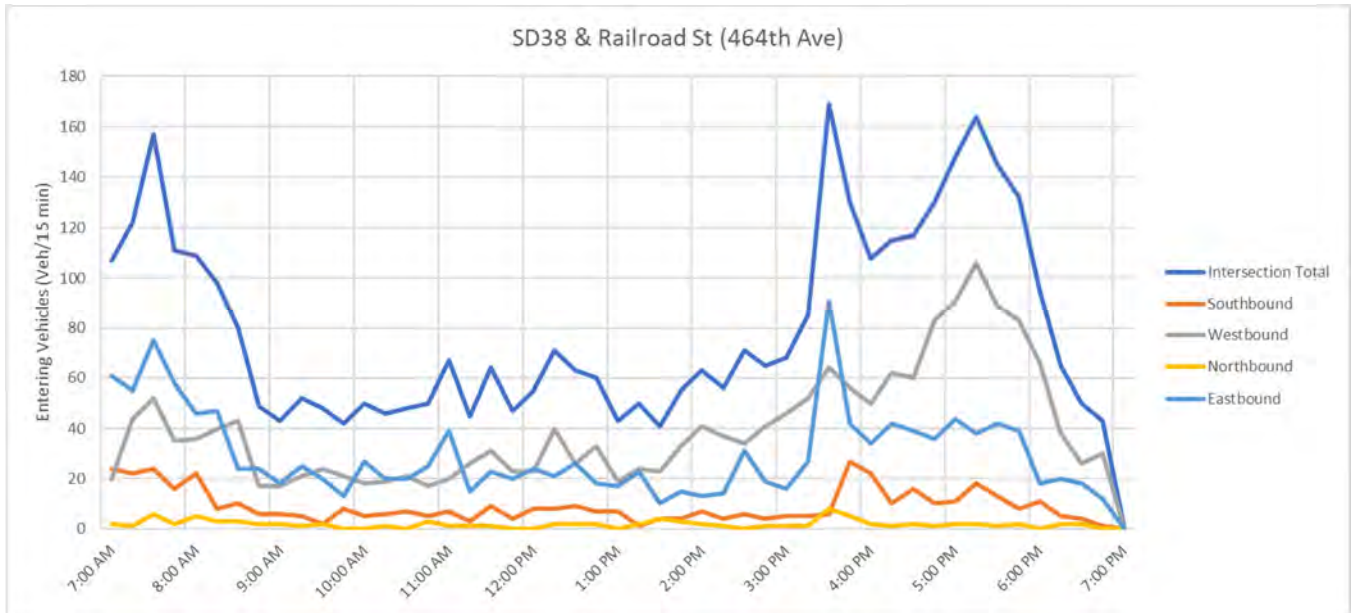
Hourly Distribution of Traffic Volumes

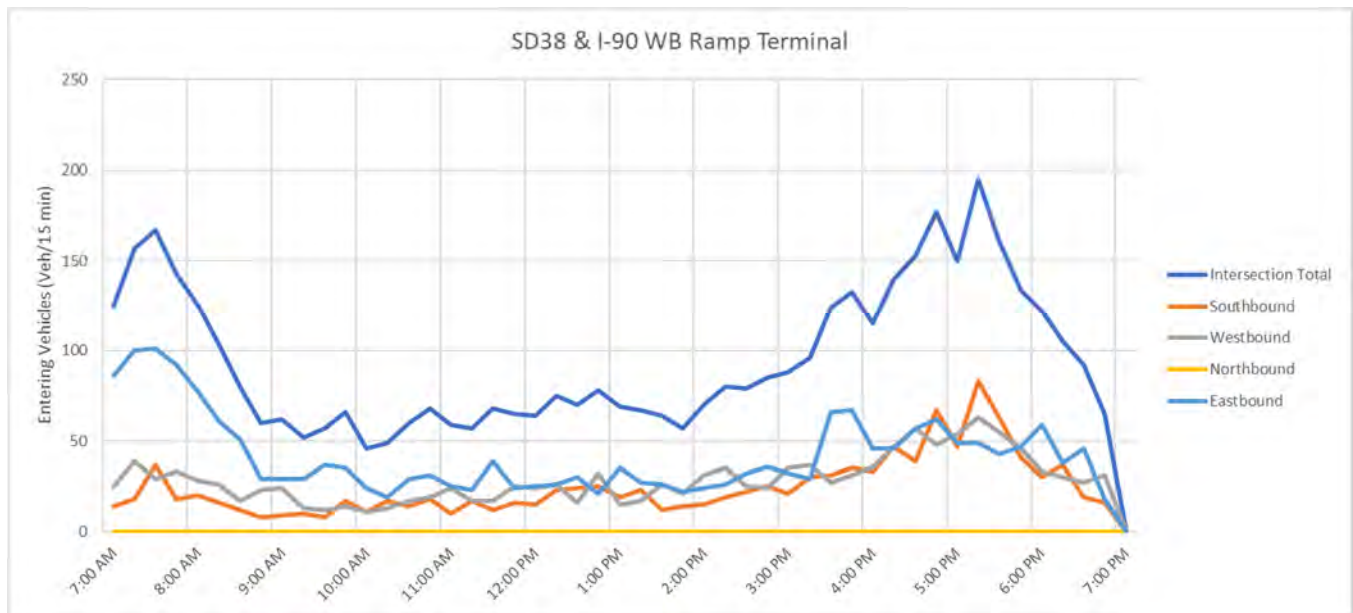
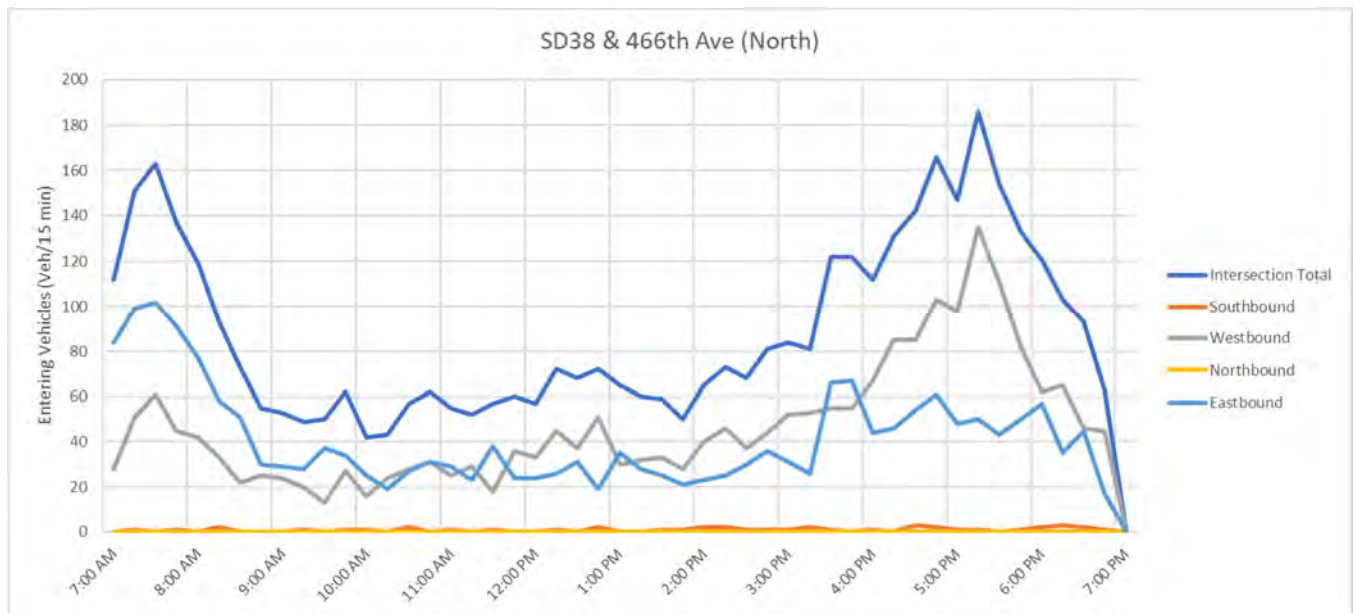


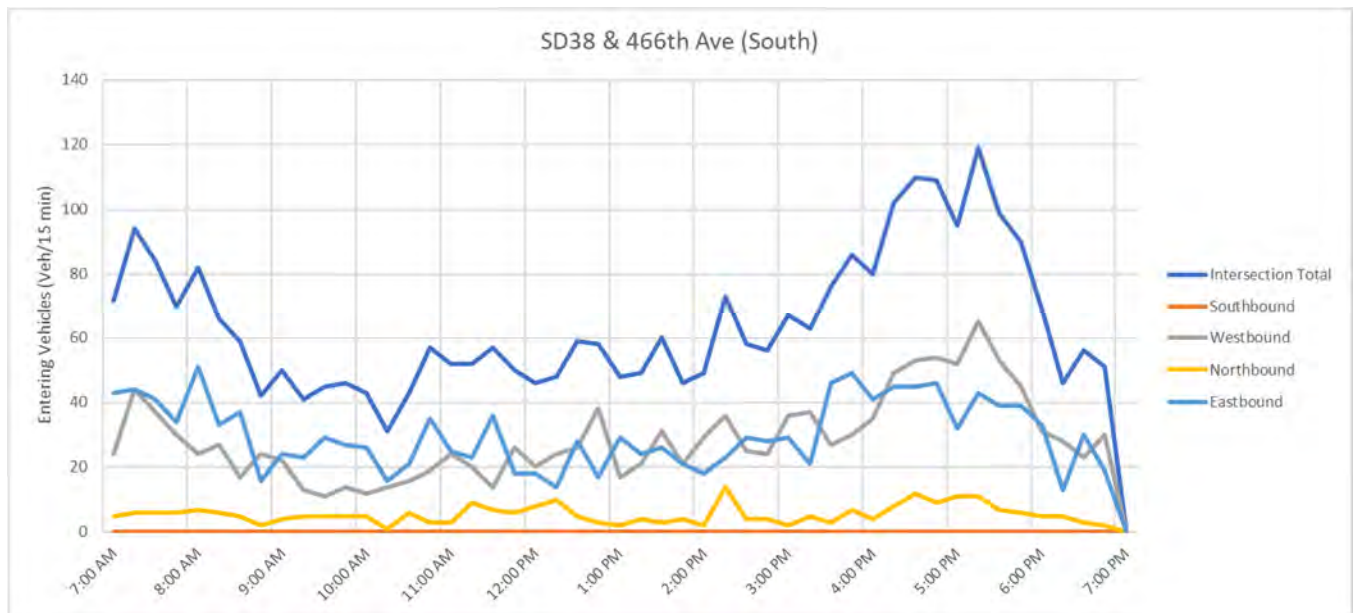
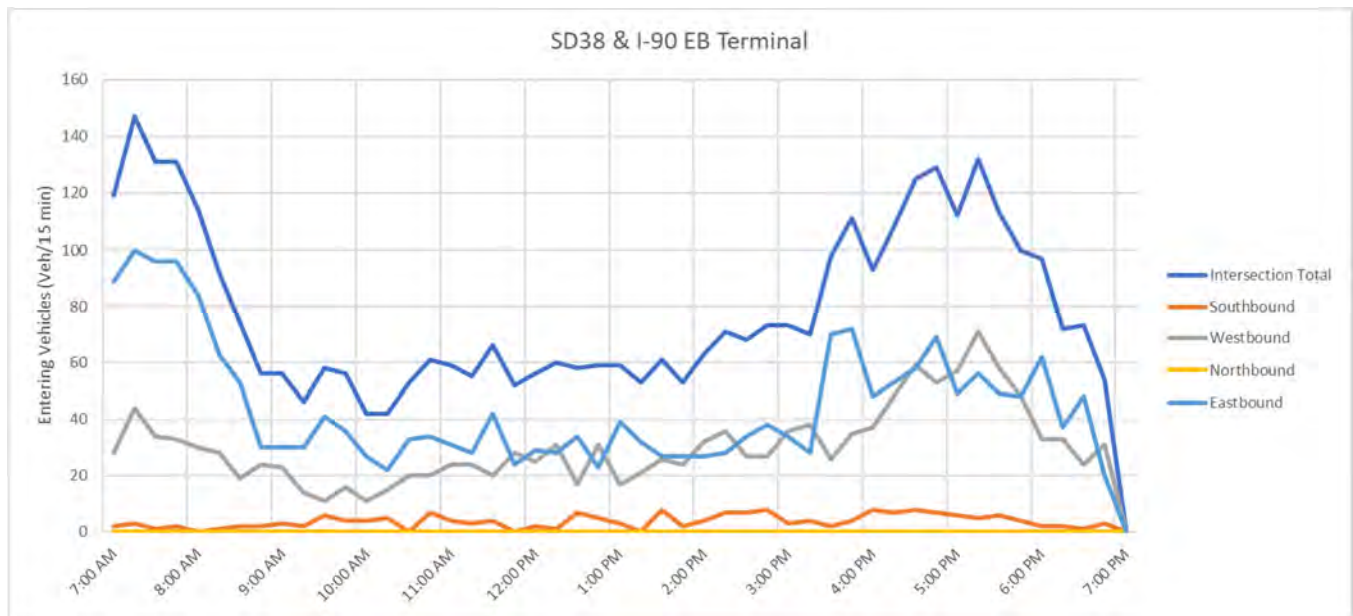


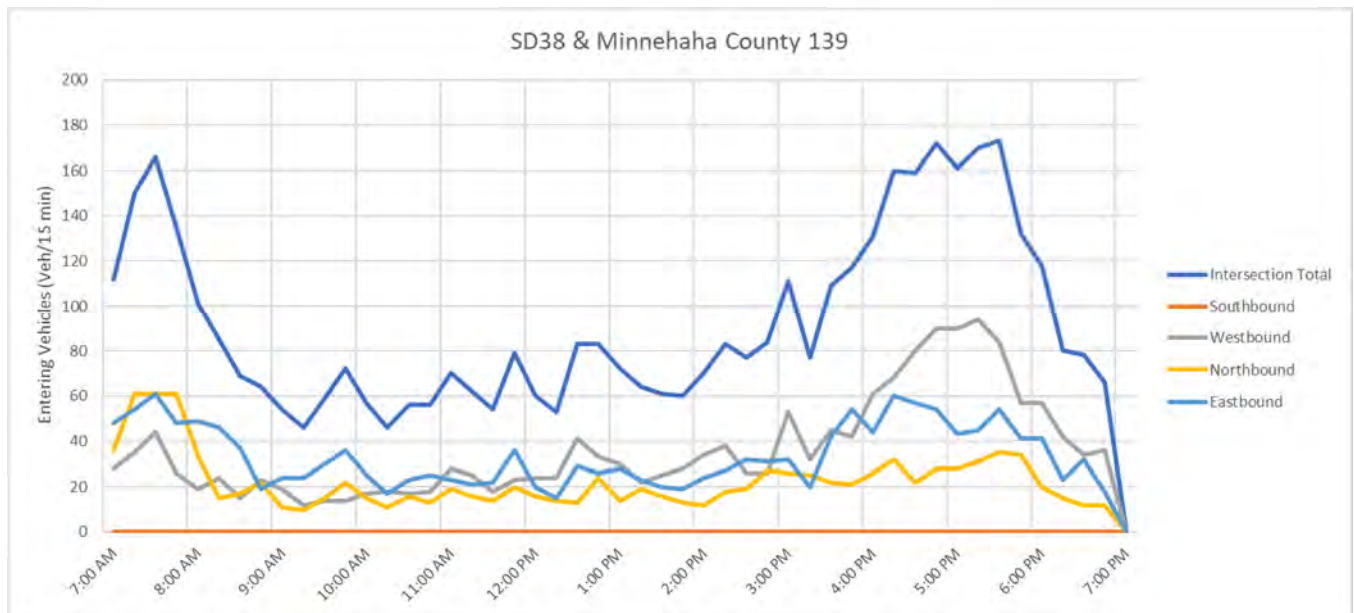
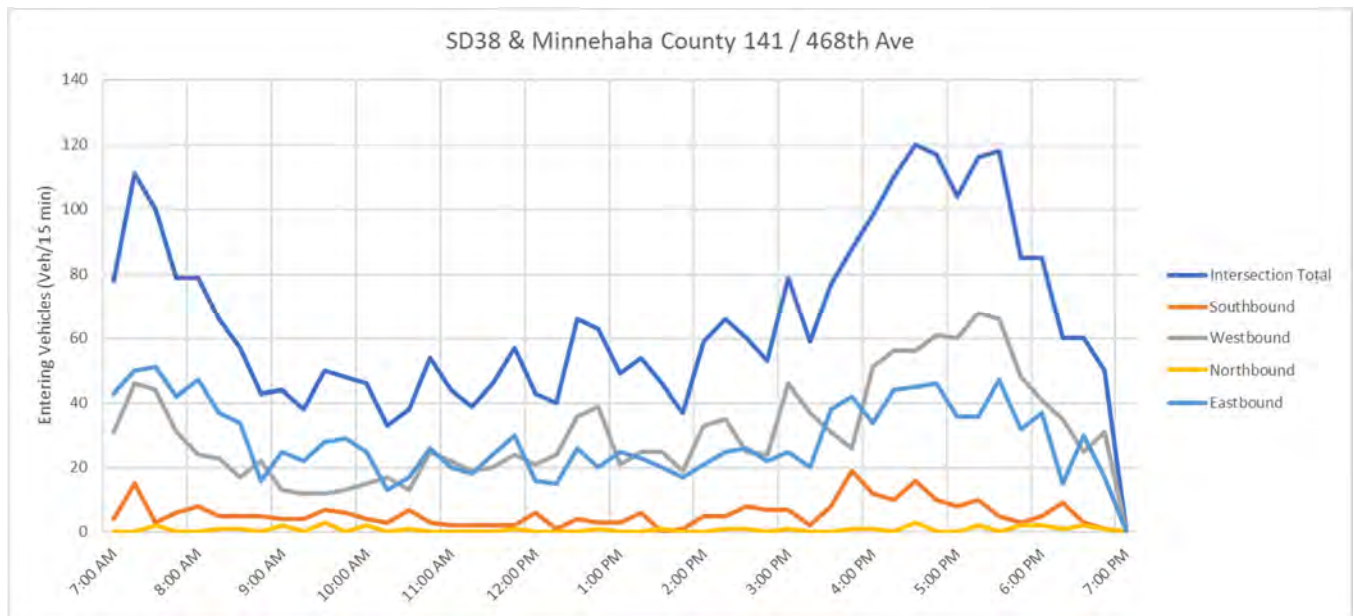


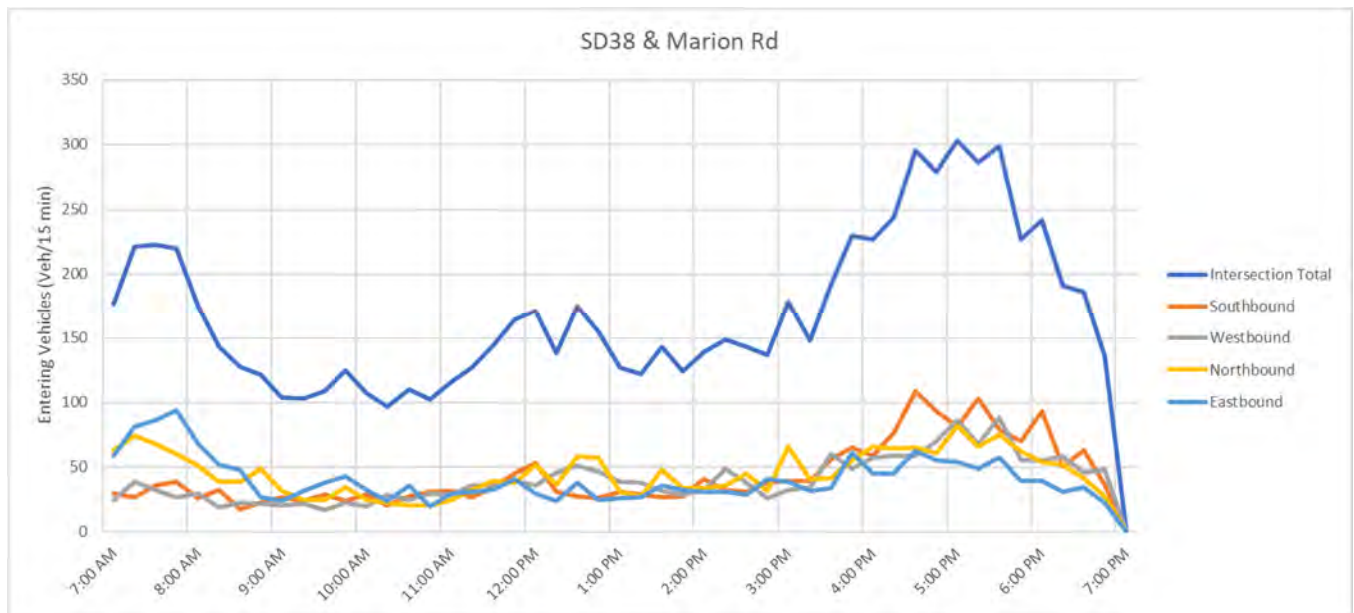
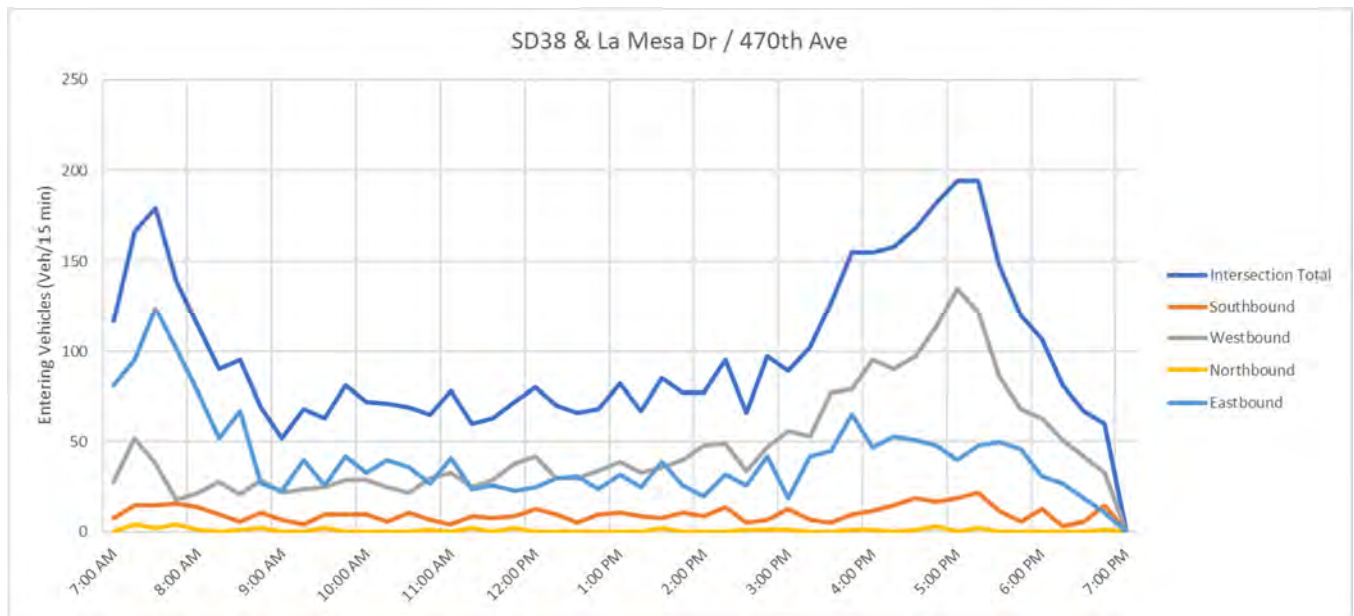














Appendix B – HCS Output

HCS Two-Way Stop-Control Report

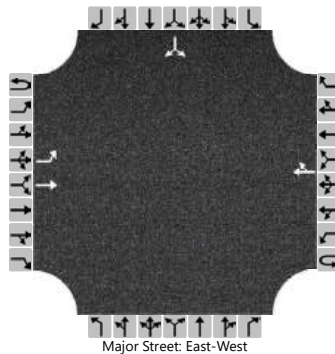
General Information

Analyst	MJV
Agency/Co.	HRG
Date Performed	12/28/2022
Analysis Year	2022
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & SD 19
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	SD 19
Peak Hour Factor	0.90
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	0	0	0	1	0		0	0	0		0	1	0
Configuration		L	T					TR							LR	
Volume (veh/h)		30	85				55	30						40		55
Percent Heavy Vehicles (%)		30												9		11
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)		4.40												6.49		6.31
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.47												3.58		3.40

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		33													106	
Capacity, c (veh/h)		1341													839	
v/c Ratio		0.02													0.13	
95% Queue Length, Q ₉₅ (veh)		0.1													0.4	
Control Delay (s/veh)		7.8													9.9	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)	2.0												9.9			
Approach LOS	A												A			

HCS Two-Way Stop-Control Report

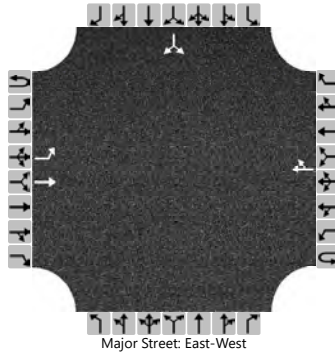
General Information

Analyst	MJV
Agency/Co.	HRG
Date Performed	12/28/2022
Analysis Year	2022
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & SD 19
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	SD 19
Peak Hour Factor	0.83
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	0	0	0	1	0		0	0	0		0	1	0
Configuration		L	T					TR							LR	
Volume (veh/h)		50	55				90	45						20		30
Percent Heavy Vehicles (%)		2												10		14
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)		4.12												6.50		6.34
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.59		3.43

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		60													60	
Capacity, c (veh/h)		1415													759	
v/c Ratio		0.04													0.08	
95% Queue Length, Q ₉₅ (veh)		0.1													0.3	
Control Delay (s/veh)		7.7													10.2	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	3.6												10.2			
Approach LOS	A												B			

HCS Two-Way Stop-Control Report

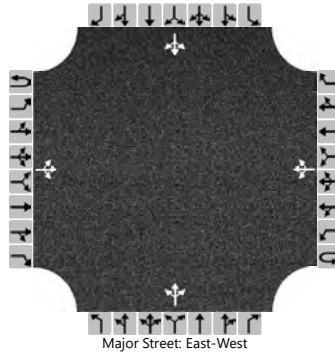
General Information

Analyst	MJV
Agency/Co.	HRG
Date Performed	12/28/2022
Analysis Year	2022
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & 459th
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	459th Ave
Peak Hour Factor	0.85
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	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		0	115	4		1	75	0		8	0	4		5	0	0
Percent Heavy Vehicles (%)		3				3				13	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.13				4.13				7.23	6.50	6.20		7.10	6.50	6.20
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)		2.23				2.23				3.62	4.00	3.30		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

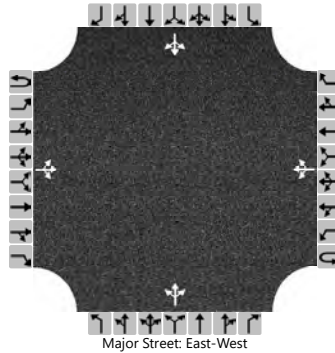
Flow Rate, v (veh/h)		0				1					14				6	
Capacity, c (veh/h)		1501				1437					763				729	
v/c Ratio		0.00				0.00					0.02				0.01	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.1				0.0	
Control Delay (s/veh)		7.4	0.0	0.0		7.5	0.0	0.0			9.8				10.0	
Level of Service (LOS)		A	A	A		A	A	A			A				A	
Approach Delay (s/veh)	0.0				0.1				9.8				10.0			
Approach LOS	A				A				A				A			

HCS Two-Way Stop-Control Report

General Information

Analyst	MJV	Intersection	SD 38 & 459th
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	12/28/2022	East/West Street	SD 38
Analysis Year	2022	North/South Street	459th Ave
Time Analyzed	PM Peak	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		0	70	5		7	130	1		8	0	2		1	1	0
Percent Heavy Vehicles (%)		0				0				13	0	0		0	100	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.10				7.23	6.50	6.20		7.10	7.50	6.20
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)		2.20				2.20				3.62	4.00	3.30		3.50	4.90	3.30

Delay, Queue Length, and Level of Service

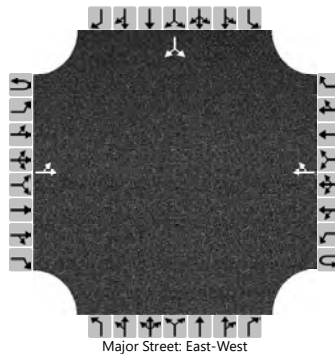
Flow Rate, v (veh/h)		0				8					11				2	
Capacity, c (veh/h)		1449				1526					730				600	
v/c Ratio		0.00				0.01					0.02				0.00	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.0				0.0	
Control Delay (s/veh)		7.5	0.0	0.0		7.4	0.0	0.0			10.0				11.0	
Level of Service (LOS)		A	A	A		A	A	A			B				B	
Approach Delay (s/veh)	0.0				0.4				10.0				11.0			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

General Information

Analyst	MJV	Intersection	SD 38 & I-90 Expressway
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	12/28/2022	East/West Street	SD 38
Analysis Year	2022	North/South Street	I-90 Expressway
Time Analyzed	AM Peak	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		0	120				80	0						0		0
Percent Heavy Vehicles (%)		3												3		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

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

Delay, Queue Length, and Level of Service

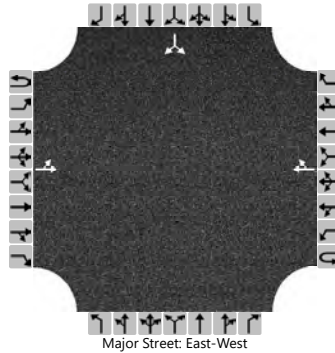
Flow Rate, v (veh/h)		0													0	
Capacity, c (veh/h)		1500													0	
v/c Ratio		0.00														
95% Queue Length, Q ₉₅ (veh)		0.0														
Control Delay (s/veh)		7.4	0.0													
Level of Service (LOS)		A	A													
Approach Delay (s/veh)	0.0															
Approach LOS	A															

HCS Two-Way Stop-Control Report

General Information

Analyst	MJV	Intersection	SD 38 & I-90 Expressway
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	12/28/2022	East/West Street	SD 38
Analysis Year	2022	North/South Street	I-90 Expressway
Time Analyzed	PM Peak	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		0	80				140	0						0		0
Percent Heavy Vehicles (%)		3												3		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

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

Delay, Queue Length, and Level of Service

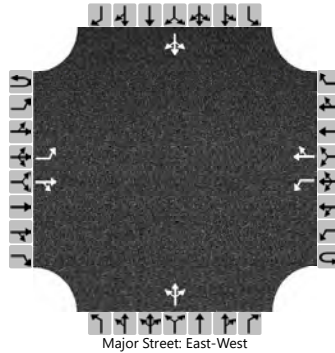
Flow Rate, v (veh/h)		0													0	
Capacity, c (veh/h)		1418													0	
v/c Ratio		0.00														
95% Queue Length, Q ₉₅ (veh)		0.0														
Control Delay (s/veh)		7.5	0.0													
Level of Service (LOS)		A	A													
Approach Delay (s/veh)	0.0															
Approach LOS	A															

HCS Two-Way Stop-Control Report

General Information

Analyst	MJV	Intersection	SD 38 & 463rd Ave / Western Ave
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	12/28/2022	East/West Street	SD 38
Analysis Year	2022	North/South Street	463rd Ave / Western Ave
Time Analyzed	AM Peak	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		5	90	45		30	50	15		35	45	45		20	45	3
Percent Heavy Vehicles (%)		3				3				14	2	6		0	7	33
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.13				4.13				7.24	6.52	6.26		7.10	6.57	6.53
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)		2.23				2.23				3.63	4.02	3.35		3.50	4.06	3.60

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		6				33					139				76	
Capacity, c (veh/h)		1521				1425					682				601	
v/c Ratio		0.00				0.02					0.20				0.13	
95% Queue Length, Q ₉₅ (veh)		0.0				0.1					0.8				0.4	
Control Delay (s/veh)		7.4				7.6					11.6				11.9	
Level of Service (LOS)		A				A					B				B	
Approach Delay (s/veh)	0.3				2.4				11.6				11.9			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

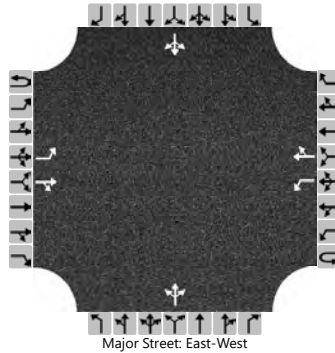
General Information

Analyst	MJV
Agency/Co.	HRG
Date Performed	12/28/2022
Analysis Year	2022
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & 463rd Ave / Western Ave
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	463rd Ave / Western Ave
Peak Hour Factor	0.89
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	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		9	60	30		65	105	30		40	50	85		30	55	15
Percent Heavy Vehicles (%)		22				3				0	11	4		0	4	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.32				4.13				7.10	6.61	6.24		7.10	6.54	6.20
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)		2.40				2.23				3.50	4.10	3.34		3.50	4.04	3.30

Delay, Queue Length, and Level of Service

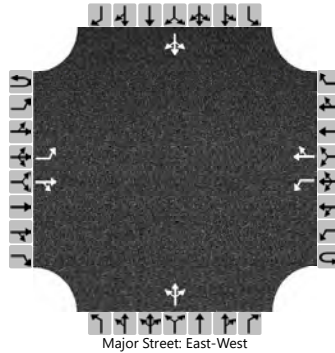
Flow Rate, v (veh/h)		10				73					197				112	
Capacity, c (veh/h)		1316				1485					635				512	
v/c Ratio		0.01				0.05					0.31				0.22	
95% Queue Length, Q ₉₅ (veh)		0.0				0.2					1.3				0.8	
Control Delay (s/veh)		7.8				7.5					13.2				14.0	
Level of Service (LOS)		A				A					B				B	
Approach Delay (s/veh)	0.7				2.5				13.2				14.0			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

General Information

Analyst	MJV	Intersection	SD 38 & Main Ave
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	12/28/2022	East/West Street	SD 38
Analysis Year	2022	North/South Street	Main Ave (9th St)
Time Analyzed	AM Peak	Peak Hour Factor	0.80
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		1	135	20		20	90	7		20	3	45		1	6	2
Percent Heavy Vehicles (%)		0				11				5	0	2		0	17	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.21				7.15	6.50	6.22		7.10	6.67	6.20
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)		2.20				2.30				3.55	4.00	3.32		3.50	4.15	3.30

Delay, Queue Length, and Level of Service

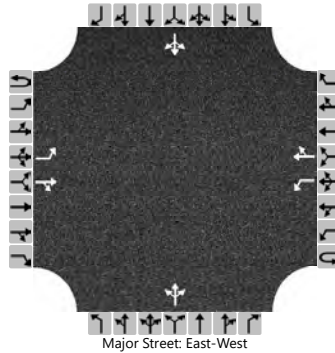
Flow Rate, v (veh/h)		1				25					85				11	
Capacity, c (veh/h)		1479				1327					738				592	
v/c Ratio		0.00				0.02					0.12				0.02	
95% Queue Length, Q ₉₅ (veh)		0.0				0.1					0.4				0.1	
Control Delay (s/veh)		7.4				7.8					10.5				11.2	
Level of Service (LOS)		A				A					B				B	
Approach Delay (s/veh)	0.0				1.3				10.5				11.2			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

General Information

Analyst	MJV	Intersection	SD 38 & Main Ave
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	12/28/2022	East/West Street	SD 38
Analysis Year	2022	North/South Street	Main Ave (9th St)
Time Analyzed	PM Peak	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		6	125	25		35	175	30		20	10	30		20	15	4
Percent Heavy Vehicles (%)		0				0				5	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.10				7.15	6.50	6.20		7.10	6.50	6.20
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)		2.20				2.20				3.55	4.00	3.30		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

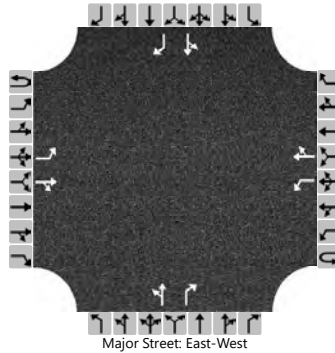
Flow Rate, v (veh/h)		7				39					67				43	
Capacity, c (veh/h)		1352				1424					626				501	
v/c Ratio		0.00				0.03					0.11				0.09	
95% Queue Length, Q ₉₅ (veh)		0.0				0.1					0.4				0.3	
Control Delay (s/veh)		7.7				7.6					11.4				12.9	
Level of Service (LOS)		A				A					B				B	
Approach Delay (s/veh)	0.3				1.1				11.4				12.9			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

General Information

Analyst	MJV	Intersection	SD 38 & Vandemark Ave
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	12/28/2022	East/West Street	SD 38
Analysis Year	2022	North/South Street	Vandemark Avenue
Time Analyzed	AM	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	0		0	1	1		0	1	1
Configuration		L		TR		L		TR		LT		R		LT		R
Volume (veh/h)		15	190	6		1	110	11		5	3	4		20	1	15
Percent Heavy Vehicles (%)		0				0				40	0	0		0	0	7
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized									No				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)		4.10				4.10				7.50	6.50	6.20		7.10	6.50	6.27
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)		2.20				2.20				3.86	4.00	3.30		3.50	4.00	3.36

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		17				1				9		4		23		17
Capacity, c (veh/h)		1463				1364				519		831		570		908
v/c Ratio		0.01				0.00				0.02		0.01		0.04		0.02
95% Queue Length, Q ₉₅ (veh)		0.0				0.0				0.1		0.0		0.1		0.1
Control Delay (s/veh)		7.5				7.6				12.1		9.4		11.6		9.0
Level of Service (LOS)		A				A				B		A		B		A
Approach Delay (s/veh)	0.5				0.1				11.2				10.5			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

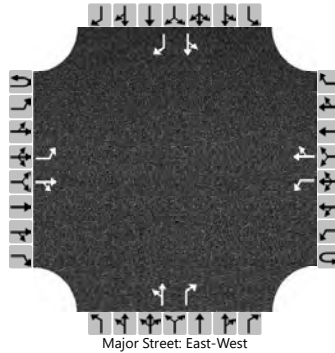
General Information

Analyst	MJV
Agency/Co.	HRG
Date Performed	12/28/2022
Analysis Year	2022
Time Analyzed	AM
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & Vandemark Ave
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	Vandemark Avenue
Peak Hour Factor	0.88
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	0	0	1	1	0		0	1	1		0	1	1
Configuration		L		TR		L		TR		LT		R		LT		R
Volume (veh/h)		10	120	2		0	245	20		0	0	2		15	0	15
Percent Heavy Vehicles (%)		0				0				0	0	100		0	0	7
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized									No				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)		4.10				4.10				7.10	6.50	7.20		7.10	6.50	6.27
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)		2.20				2.20				3.50	4.00	4.20		3.50	4.00	3.36

Delay, Queue Length, and Level of Service

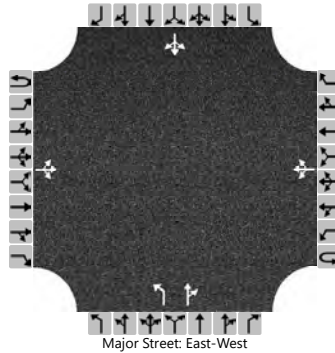
Flow Rate, v (veh/h)		11				0				0		2		17		17
Capacity, c (veh/h)		1271				1457				0		705		517		738
v/c Ratio		0.01				0.00						0.00		0.03		0.02
95% Queue Length, Q ₉₅ (veh)		0.0				0.0						0.0		0.1		0.1
Control Delay (s/veh)		7.9				7.5						10.1		12.2		10.0
Level of Service (LOS)		A				A						B		B		A
Approach Delay (s/veh)	0.6				0.0								11.1			
Approach LOS	A				A								B			

HCS Two-Way Stop-Control Report

General Information

Analyst	MJV	Intersection	SD 38 & 2nd St
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	12/28/2022	East/West Street	SD 38
Analysis Year	2022	North/South Street	2nd St
Time Analyzed	AM Peak	Peak Hour Factor	0.85
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		1	1	0		0	1	0
Configuration			LTR				LTR			L		TR			LTR	
Volume (veh/h)		10	160	6		50	80	5		3	15	85		20	30	3
Percent Heavy Vehicles (%)		10				16				33	8	5		0	4	8
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.20				4.26				7.43	6.58	6.25		7.10	6.54	6.28
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)		2.29				2.34				3.80	4.07	3.35		3.50	4.04	3.37

Delay, Queue Length, and Level of Service

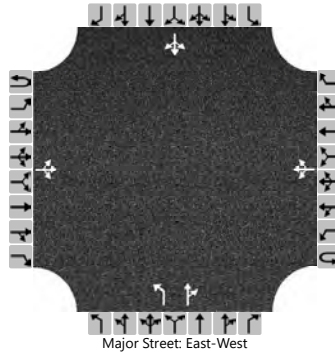
Flow Rate, v (veh/h)		12				59				4		118			62	
Capacity, c (veh/h)		1415				1298				414		751			463	
v/c Ratio		0.01				0.05				0.01		0.16			0.13	
95% Queue Length, Q ₉₅ (veh)		0.0				0.1				0.0		0.6			0.5	
Control Delay (s/veh)		7.6	0.1	0.1		7.9	0.4	0.4		13.8		10.7			14.0	
Level of Service (LOS)		A	A	A		A	A	A		B		B			B	
Approach Delay (s/veh)	0.5				3.2				10.8				14.0			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

General Information

Analyst	MJV	Intersection	SD 38 & 2nd St
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	12/28/2022	East/West Street	SD 38
Analysis Year	2022	North/South Street	2nd St
Time Analyzed	AM Peak	Peak Hour Factor	0.85
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		1	1	0		0	1	0
Configuration			LTR				LTR			L		TR			LTR	
Volume (veh/h)		15	100	5		70	245	10		7	15	30		5	15	10
Percent Heavy Vehicles (%)		0				0				0	0	6		0	6	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.10				7.10	6.50	6.26		7.10	6.56	6.20
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)		2.20				2.20				3.50	4.00	3.35		3.50	4.05	3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		18				82				8		53			35	
Capacity, c (veh/h)		1248				1476				349		610			425	
v/c Ratio		0.01				0.06				0.02		0.09			0.08	
95% Queue Length, Q ₉₅ (veh)		0.0				0.2				0.1		0.3			0.3	
Control Delay (s/veh)		7.9	0.1	0.1		7.6	0.5	0.5		15.6		11.5			14.2	
Level of Service (LOS)		A	A	A		A	A	A		C		B			B	
Approach Delay (s/veh)	1.1				2.0				12.0				14.2			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

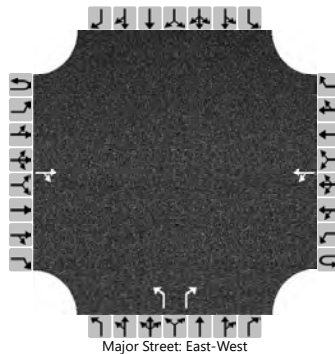
General Information

Analyst	MJV
Agency/Co.	HRG
Date Performed	12/28/2022
Analysis Year	2022
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & West Central HS Entrance
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	West Central HS Entrance
Peak Hour Factor	0.84
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	0	1	0	0	0	1	0		1	0	1		0	0	0
Configuration				TR		LT				L		R				
Volume (veh/h)			210	50		30	120			20		30				
Percent Heavy Vehicles (%)						0				0		0				
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)						4.10				6.40		6.20				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.20				3.50		3.30				

Delay, Queue Length, and Level of Service

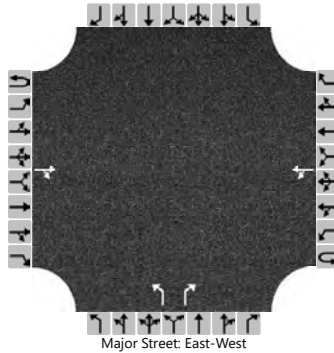
Flow Rate, v (veh/h)						36				24		36				
Capacity, c (veh/h)						1262				522		764				
v/c Ratio						0.03				0.05		0.05				
95% Queue Length, Q ₉₅ (veh)						0.1				0.1		0.1				
Control Delay (s/veh)						7.9	0.2			12.2		9.9				
Level of Service (LOS)						A	A			B		A				
Approach Delay (s/veh)					1.8				10.9							
Approach LOS					A				B							

HCS Two-Way Stop-Control Report

General Information

Analyst	MJV	Intersection	SD 38 & West Central HS Entrance
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	12/28/2022	East/West Street	SD 38
Analysis Year	2022	North/South Street	West Central HS Entrance
Time Analyzed	PM Peak	Peak Hour Factor	0.83
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		1	0	1		0	0	0
Configuration				TR		LT				L		R				
Volume (veh/h)			135	2		2	315			8		8				
Percent Heavy Vehicles (%)						0				0		0				
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)						4.10				6.40		6.20				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.20				3.50		3.30				

Delay, Queue Length, and Level of Service

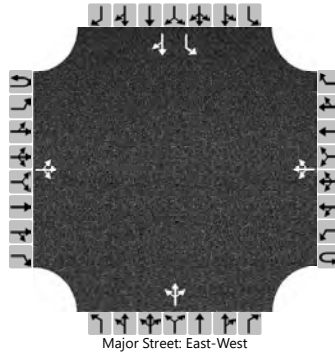
Flow Rate, v (veh/h)						2				10		10				
Capacity, c (veh/h)						1425				500		886				
v/c Ratio						0.00				0.02		0.01				
95% Queue Length, Q ₉₅ (veh)						0.0				0.1		0.0				
Control Delay (s/veh)						7.5	0.0			12.3		9.1				
Level of Service (LOS)						A	A			B		A				
Approach Delay (s/veh)					0.1				10.7							
Approach LOS					A				B							

HCS Two-Way Stop-Control Report

General Information

Analyst	MJV	Intersection	SD 38 & Railroad Street
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	12/28/2022	East/West Street	SD 38
Analysis Year	2022	North/South Street	Railroad St
Time Analyzed	AM Peak	Peak Hour Factor	0.79
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		1	1	0
Configuration			LTR				LTR				LTR			L		TR
Volume (veh/h)		2	230	0		5	110	50		1	0	15		80	2	3
Percent Heavy Vehicles (%)		0				0				0	0	15		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.10				7.10	6.50	6.35		7.10	6.50	6.20
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)		2.20				2.20				3.50	4.00	3.44		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

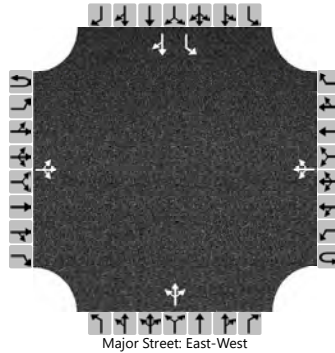
Flow Rate, v (veh/h)		3				6					20			101		6
Capacity, c (veh/h)		1381				1282					701			483		663
v/c Ratio		0.00				0.00					0.03			0.21		0.01
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.1			0.8		0.0
Control Delay (s/veh)		7.6	0.0	0.0		7.8	0.0	0.0			10.3			14.4		10.5
Level of Service (LOS)		A	A	A		A	A	A			B			B		B
Approach Delay (s/veh)	0.1				0.3				10.3				14.2			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

General Information

Analyst	MJV	Intersection	SD 38 & Railroad Street
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	12/28/2022	East/West Street	SD 38
Analysis Year	2022	North/South Street	Railroad St
Time Analyzed	PM Peak	Peak Hour Factor	0.89
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		1	1	0
Configuration			LTR				LTR				LTR			L		TR
Volume (veh/h)		2	155	2		5	280	85		1	1	4		45	5	3
Percent Heavy Vehicles (%)		0				40				0	0	15		5	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.50				7.10	6.50	6.35		7.15	6.50	6.20
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)		2.20				2.56				3.50	4.00	3.44		3.55	4.00	3.30

Delay, Queue Length, and Level of Service

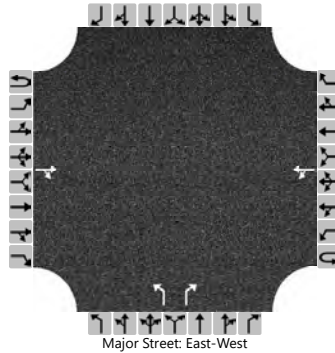
Flow Rate, v (veh/h)		2				6					7			51		9
Capacity, c (veh/h)		1160				1200					641			432		508
v/c Ratio		0.00				0.00					0.01			0.12		0.02
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.0			0.4		0.1
Control Delay (s/veh)		8.1	0.0	0.0		8.0	0.0	0.0			10.7			14.4		12.2
Level of Service (LOS)		A	A	A		A	A	A			B			B		B
Approach Delay (s/veh)	0.1				0.2				10.7				14.1			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

General Information

Analyst	MJV	Intersection	SD 38 & 260th St (Mickelson Rd)
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	12/28/2022	East/West Street	SD 38
Analysis Year	2022	North/South Street	260th St (Mickelson Rd)
Time Analyzed	AM Peak	Peak Hour Factor	0.89
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		1	0	1		0	0	0
Configuration				TR		LT				L		R				
Volume (veh/h)			290	20		25	170			25		55				
Percent Heavy Vehicles (%)						26				4		3				
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)						4.36				6.44		6.23				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.43				3.54		3.33				

Delay, Queue Length, and Level of Service

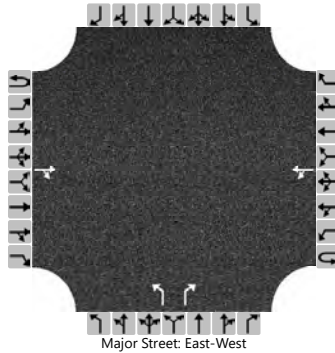
Flow Rate, v (veh/h)						28				28		62				
Capacity, c (veh/h)						1089				457		703				
v/c Ratio						0.03				0.06		0.09				
95% Queue Length, Q ₉₅ (veh)						0.1				0.2		0.3				
Control Delay (s/veh)						8.4	0.2			13.4		10.6				
Level of Service (LOS)						A	A			B		B				
Approach Delay (s/veh)					1.3				11.5							
Approach LOS					A				B							

HCS Two-Way Stop-Control Report

General Information

Analyst	MJV	Intersection	SD 38 & 260th St (Mickelson Rd)
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	12/28/2022	East/West Street	SD 38
Analysis Year	2022	North/South Street	260th St (Mickelson Rd)
Time Analyzed	PM Peak	Peak Hour Factor	0.89
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		1	0	1		0	0	0
Configuration				TR		LT				L		R				
Volume (veh/h)			170	10		75	365			10		25				
Percent Heavy Vehicles (%)						1				0		0				
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)						4.11				6.40		6.20				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.21				3.50		3.30				

Delay, Queue Length, and Level of Service

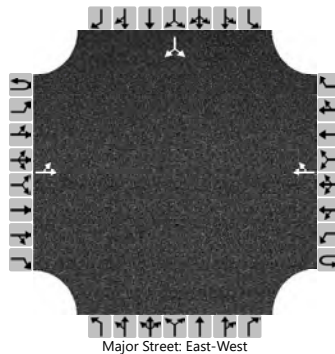
Flow Rate, v (veh/h)						84				11		28				
Capacity, c (veh/h)						1376				340		850				
v/c Ratio						0.06				0.03		0.03				
95% Queue Length, Q ₉₅ (veh)						0.2				0.1		0.1				
Control Delay (s/veh)						7.8	0.6			16.0		9.4				
Level of Service (LOS)						A	A			C		A				
Approach Delay (s/veh)					1.8				11.3							
Approach LOS					A				B							

HCS Two-Way Stop-Control Report

General Information

Analyst	MJV	Intersection	SD38 & 466th Ave
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	12/28/2022	East/West Street	SD 38
Analysis Year	2022	North/South Street	466th Ave
Time Analyzed	AM Peak	Peak Hour Factor	0.87
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		1	370				195	3						2		0
Percent Heavy Vehicles (%)		0												50		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.90		6.23
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.95		3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		1													2	
Capacity, c (veh/h)		1353													365	
v/c Ratio		0.00													0.01	
95% Queue Length, Q ₉₅ (veh)		0.0													0.0	
Control Delay (s/veh)		7.7	0.0												14.9	
Level of Service (LOS)		A	A												B	
Approach Delay (s/veh)	0.0												14.9			
Approach LOS	A												B			

HCS Two-Way Stop-Control Report

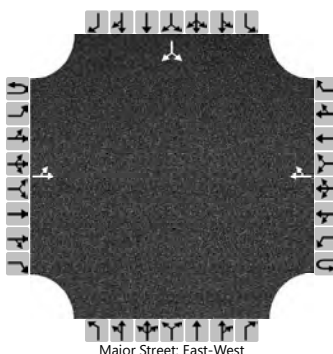
General Information

Analyst	MJV
Agency/Co.	HRG
Date Performed	12/28/2022
Analysis Year	2022
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD38 & 466th Ave
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	466th Ave
Peak Hour Factor	0.88
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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		0	200				445	1						3		1
Percent Heavy Vehicles (%)		0												33		0
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)		4.10												6.73		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.80		3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0													5	
Capacity, c (veh/h)		1068													383	
v/c Ratio		0.00													0.01	
95% Queue Length, Q ₉₅ (veh)		0.0													0.0	
Control Delay (s/veh)		8.4	0.0												14.5	
Level of Service (LOS)		A	A												B	
Approach Delay (s/veh)	0.0												14.5			
Approach LOS	A												B			

HCS Two-Way Stop-Control Report

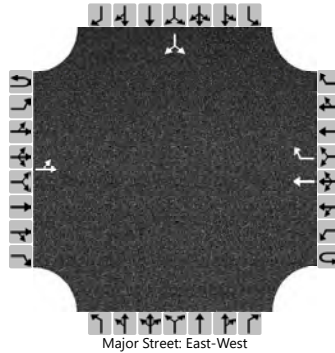
General Information

Analyst	MJV
Agency/Co.	HRG
Date Performed	12/28/2022
Analysis Year	2022
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & I-90 WB Terminal
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	I-90 WB Terminal
Peak Hour Factor	0.89
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	0	1	0	0	0	1	1		0	0	0		0	1	0
Configuration		LT					T	R							LR	
Volume (veh/h)		4	365				120	10						9		85
Percent Heavy Vehicles (%)		0												56		12
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)		4.10												6.96		6.32
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												4.00		3.41

Delay, Queue Length, and Level of Service

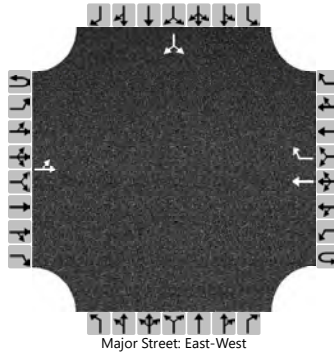
Flow Rate, v (veh/h)		4													106	
Capacity, c (veh/h)		1448													799	
v/c Ratio		0.00													0.13	
95% Queue Length, Q ₉₅ (veh)		0.0													0.5	
Control Delay (s/veh)		7.5	0.0												10.2	
Level of Service (LOS)		A	A												B	
Approach Delay (s/veh)	0.1												10.2			
Approach LOS	A												B			

HCS Two-Way Stop-Control Report

General Information

Analyst	MJV	Intersection	SD 38 & I-90 WB Terminal
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	12/28/2022	East/West Street	SD 38
Analysis Year	2022	North/South Street	I-90 WB Terminal
Time Analyzed	PM Peak	Peak Hour Factor	0.87
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	1		0	0	0		0	1	0
Configuration		LT					T	R							LR	
Volume (veh/h)		1	200				200	20						15		245
Percent Heavy Vehicles (%)		0												6		2
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)		4.10												6.46		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.55		3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		1													299	
Capacity, c (veh/h)		1324													788	
v/c Ratio		0.00													0.38	
95% Queue Length, Q ₉₅ (veh)		0.0													1.8	
Control Delay (s/veh)		7.7	0.0												12.3	
Level of Service (LOS)		A	A												B	
Approach Delay (s/veh)	0.0												12.3			
Approach LOS	A												B			

HCS Two-Way Stop-Control Report

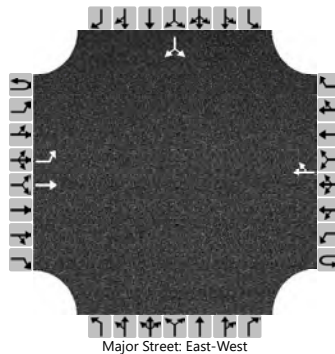
General Information

Analyst	MJV
Agency/Co.	HRG
Date Performed	12/28/2022
Analysis Year	2022
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & I-90 EB Ramp Terminal
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	I-90 EB Ramp Terminal
Peak Hour Factor	0.89
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	0	0	0	1	0		0	0	0		0	1	0
Configuration		L	T					TR							LR	
Volume (veh/h)		210	165				130	10						3		3
Percent Heavy Vehicles (%)		1							1					33		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.11												6.73		6.23
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.21												3.80		3.33

Delay, Queue Length, and Level of Service

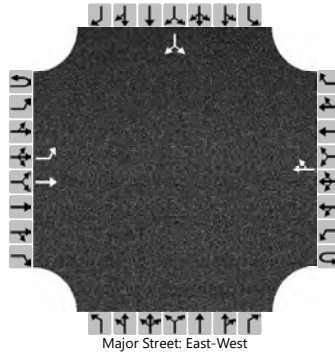
Flow Rate, v (veh/h)		236													7	
Capacity, c (veh/h)		1429													402	
v/c Ratio		0.17													0.02	
95% Queue Length, Q ₉₅ (veh)		0.6													0.1	
Control Delay (s/veh)		8.0													14.1	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	4.5												14.1			
Approach LOS	A												B			

HCS Two-Way Stop-Control Report

General Information

Analyst	MJV	Intersection	SD 38 & I-90 EB Ramp Terminal
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	12/28/2022	East/West Street	SD 38
Analysis Year	2022	North/South Street	I-90 EB Ramp Terminal
Time Analyzed	AM Peak	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	0	1	0		0	0	0		0	1	0
Configuration		L	T					TR							LR	
Volume (veh/h)		85	140				225	15						20		1
Percent Heavy Vehicles (%)		12												36		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.22												6.76		6.23
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.31												3.82		3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		94													23	
Capacity, c (veh/h)		1241													389	
v/c Ratio		0.08													0.06	
95% Queue Length, Q ₉₅ (veh)		0.2													0.2	
Control Delay (s/veh)		8.1													14.8	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	3.1												14.8			
Approach LOS	A												B			

HCS Two-Way Stop-Control Report

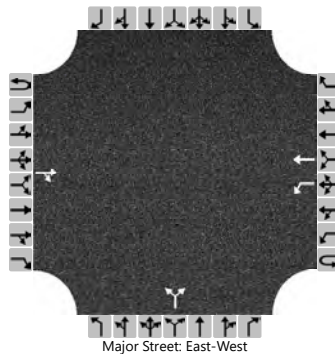
General Information

Analyst	MJV
Agency/Co.	HRG
Date Performed	12/28/2022
Analysis Year	2022
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & 466th Ave (South)
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	466th Ave (South)
Peak Hour Factor	0.88
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	0	1	0	0	1	1	0		0	1	0		0	0	0
Configuration				TR		L	T				LR					
Volume (veh/h)			160	10		10	125			15		10				
Percent Heavy Vehicles (%)						20				33		60				
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)						4.30					6.73		6.80			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.38					3.80		3.84			

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						11					28					
Capacity, c (veh/h)						1279					632					
v/c Ratio						0.01					0.04					
95% Queue Length, Q ₉₅ (veh)						0.0					0.1					
Control Delay (s/veh)						7.8					11.0					
Level of Service (LOS)						A					B					
Approach Delay (s/veh)					0.6				11.0							
Approach LOS					A				B							

HCS Two-Way Stop-Control Report

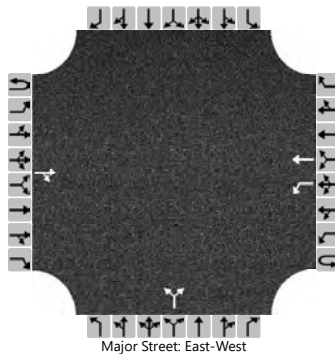
General Information

Analyst	MJV
Agency/Co.	HRG
Date Performed	12/28/2022
Analysis Year	2022
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & 466th Ave (South)
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	466th Ave (South)
Peak Hour Factor	0.89
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	0	1	0	0	1	1	0		0	1	0		0	0	0
Configuration				TR		L	T				LR					
Volume (veh/h)			150	10		9	215			25		15				
Percent Heavy Vehicles (%)						11				20		0				
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)						4.21				6.60		6.20				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.30				3.68		3.30				

Delay, Queue Length, and Level of Service

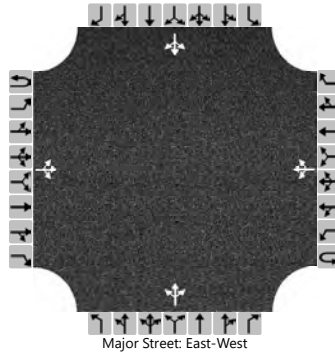
Flow Rate, v (veh/h)					10					45						
Capacity, c (veh/h)					1343					631						
v/c Ratio					0.01					0.07						
95% Queue Length, Q ₉₅ (veh)					0.0					0.2						
Control Delay (s/veh)					7.7					11.1						
Level of Service (LOS)					A					B						
Approach Delay (s/veh)					0.3				11.1							
Approach LOS					A				B							

HCS Two-Way Stop-Control Report

General Information

Analyst	MJV	Intersection	SD 38 & 468th Avenue
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	12/28/2022	East/West Street	SD 38
Analysis Year	2022	North/South Street	468th Ave / County Highway 141
Time Analyzed	AM Peak	Peak Hour Factor	0.83
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		2	190	0		0	120	30		1	1	0		30	0	4
Percent Heavy Vehicles (%)		0				0				0	100	0		4	0	50
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.10				7.10	7.50	6.20		7.14	6.50	6.70
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)		2.20				2.20				3.50	4.90	3.30		3.54	4.00	3.75

Delay, Queue Length, and Level of Service

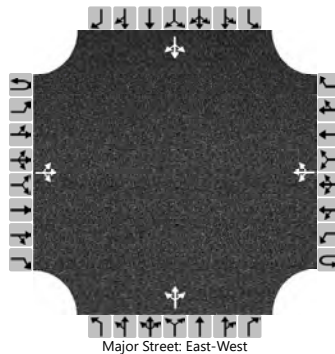
Flow Rate, v (veh/h)		2				0					2				41	
Capacity, c (veh/h)		1407				1351					476				576	
v/c Ratio		0.00				0.00					0.01				0.07	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.0				0.2	
Control Delay (s/veh)		7.6	0.0	0.0		7.7	0.0	0.0			12.6				11.7	
Level of Service (LOS)		A	A	A		A	A	A			B				B	
Approach Delay (s/veh)	0.1				0.0				12.6				11.7			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

General Information

Analyst	MJV	Intersection	SD 38 & 468th Avenue
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	12/28/2022	East/West Street	SD 38
Analysis Year	2022	North/South Street	468th Ave / County Highway 141
Time Analyzed	PM Peak	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		0	165	1		3	220	30		1	1	0		30	2	2
Percent Heavy Vehicles (%)		0				0				0	0	0		4	100	50
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.10				7.10	6.50	6.20		7.14	7.50	6.70
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)		2.20				2.20				3.50	4.00	3.30		3.54	4.90	3.75

Delay, Queue Length, and Level of Service

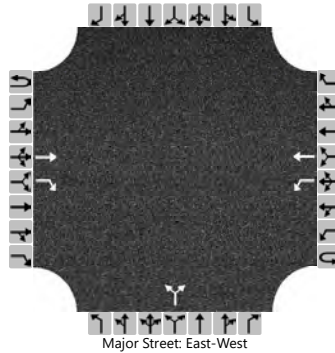
Flow Rate, v (veh/h)		0				3					2				38	
Capacity, c (veh/h)		1297				1402					510				509	
v/c Ratio		0.00				0.00					0.00				0.07	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.0				0.2	
Control Delay (s/veh)		7.8	0.0	0.0		7.6	0.0	0.0			12.1				12.6	
Level of Service (LOS)		A	A	A		A	A	A			B				B	
Approach Delay (s/veh)	0.0				0.1				12.1				12.6			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

General Information

Analyst	MJV	Intersection	SD 38 & 469th Ave
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	12/28/2022	East/West Street	SD 38
Analysis Year	2022	North/South Street	469th Ave / Co Hwy 139
Time Analyzed	AM Peak	Peak Hour Factor	0.83
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	1	1	0		0	1	0		0	0	0
Configuration			T	R		L	T				LR					
Volume (veh/h)			170	40		40	80			60		155				
Percent Heavy Vehicles (%)						5				13		3				
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)						4.15					6.53		6.23			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.25					3.62		3.33			

Delay, Queue Length, and Level of Service

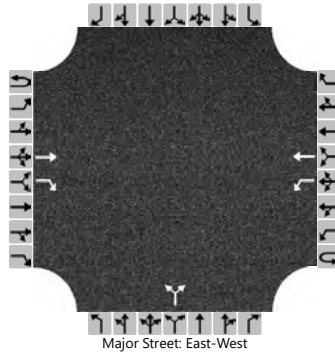
Flow Rate, v (veh/h)						48						259				
Capacity, c (veh/h)						1295						736				
v/c Ratio						0.04						0.35				
95% Queue Length, Q ₉₅ (veh)						0.1						1.6				
Control Delay (s/veh)						7.9						12.5				
Level of Service (LOS)						A						B				
Approach Delay (s/veh)					2.6				12.5							
Approach LOS					A				B							

HCS Two-Way Stop-Control Report

General Information

Analyst	MJV	Intersection	SD 38 & 469th Ave
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	12/28/2022	East/West Street	SD 38
Analysis Year	2022	North/South Street	469th Ave / Co Hwy 139
Time Analyzed	PM Peak	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	1	1	0		0	1	0		0	0	0
Configuration			T	R		L	T				LR					
Volume (veh/h)			130	70		160	200			55		70				
Percent Heavy Vehicles (%)						5				2		15				
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)						4.15				6.42		6.35				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.25				3.52		3.44				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						178					139					
Capacity, c (veh/h)						1329					517					
v/c Ratio						0.13					0.27					
95% Queue Length, Q ₉₅ (veh)						0.5					1.1					
Control Delay (s/veh)						8.1					14.5					
Level of Service (LOS)						A					B					
Approach Delay (s/veh)					3.6				14.5							
Approach LOS					A				B							

HCS Two-Way Stop-Control Report

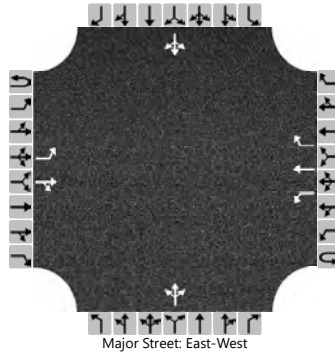
General Information

Analyst	MJV
Agency/Co.	HRG
Date Performed	12/28/2022
Analysis Year	2022
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & La Mesa
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	La Mesa
Peak Hour Factor	0.84
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	0	0	1	1	1		0	1	0		0	1	0
Configuration		L		TR		L	T	R			LTR				LTR	
Volume (veh/h)		20	380	2		0	120	9		0	8	3		40	2	15
Percent Heavy Vehicles (%)		0				0				0	13	0		0	50	0
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)		4.10				4.10				7.10	6.63	6.20		7.10	7.00	6.20
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)		2.20				2.20				3.50	4.12	3.30		3.50	4.45	3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		24				0					13					68
Capacity, c (veh/h)		1439				1117					411					434
v/c Ratio		0.02				0.00					0.03					0.16
95% Queue Length, Q ₉₅ (veh)		0.1				0.0					0.1					0.5
Control Delay (s/veh)		7.5				8.2					14.1					14.8
Level of Service (LOS)		A				A					B					B
Approach Delay (s/veh)	0.4				0.0				14.1				14.8			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

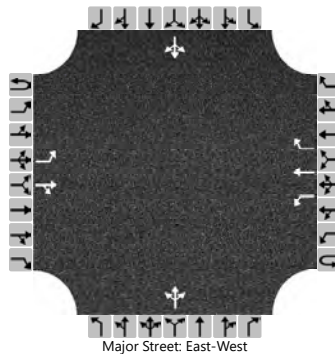
General Information

Analyst	MJV
Agency/Co.	HRG
Date Performed	12/28/2022
Analysis Year	2022
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & La Mesa
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	La Mesa
Peak Hour Factor	0.90
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	0	0	1	1	1		0	1	0		0	1	0
Configuration		L		TR		L	T	R			LTR				LTR	
Volume (veh/h)		15	175	0		5	395	55		0	2	3		45	8	20
Percent Heavy Vehicles (%)		0				0				0	0	0		9	0	0
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)		4.10				4.10				7.10	6.50	6.20		7.19	6.50	6.20
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)		2.20				2.20				3.50	4.00	3.30		3.58	4.00	3.30

Delay, Queue Length, and Level of Service

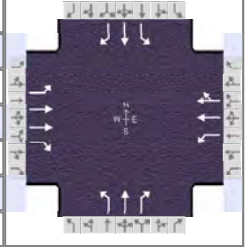
Flow Rate, v (veh/h)		17				6					6				81	
Capacity, c (veh/h)		1075				1391					532				397	
v/c Ratio		0.02				0.00					0.01				0.20	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.0				0.8	
Control Delay (s/veh)		8.4				7.6					11.8				16.4	
Level of Service (LOS)		A				A					B				C	
Approach Delay (s/veh)	0.7				0.1				11.8				16.4			
Approach LOS	A				A				B				C			

HCS Signalized Intersection Results Summary

General Information

Agency	HRG		
Analyst	MJV	Analysis Date	Dec 28, 2022
Jurisdiction	SDDOT	Time Period	AM Peak
Urban Street	SD 38	Analysis Year	2022
Intersection	SD 38 & Marion Street	File Name	(18) SD38&Marion
Project Description			

Intersection Information



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	90	180	60	30	60	40	60	125	65	25	80	22

Signal Information

Cycle, s	50.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On	Green	1.9	1.9	17.3	1.6	1.4	9.9		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	0.0	4.0	4.0	0.0	4.0		
				Red	0.0	0.0	0.0	0.0	0.0	0.0		

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	2.0	3.0	1.1	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	7.8	23.2	5.9	21.3	7.0	15.3	5.6	13.9
Change Period, (Y+R _c), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Allow Headway (MAH), s	2.9	0.0	2.9	0.0	2.9	2.9	2.9	2.9
Queue Clearance Time (g _s), s	4.9		2.6		4.0	5.5	2.9	4.1
Green Extension Time (g _e), s	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.4
Phase Call Probability	0.75		0.37		0.60	1.00	0.32	0.99
Max Out Probability	0.17		0.00		1.00	0.01	1.00	0.01

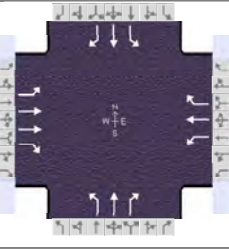
Movement Group Results

Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R	
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14	
Adjusted Flow Rate (v), veh/h	100	200	67	33	56	55	67	139	72	28	89	24	
Adjusted Saturation Flow Rate (s), veh/h/ln	1701	1674	1525	1714	1772	1546	1647	1674	1502	1554	1758	1466	
Queue Service Time (g_s), s	2.9	2.0	1.4	0.6	1.1	1.2	2.0	3.5	2.0	0.9	2.1	0.7	
Cycle Queue Clearance Time (g_c), s	2.9	2.0	1.4	0.6	1.1	1.2	2.0	3.5	2.0	0.9	2.1	0.7	
Green Ratio (g/C)	0.08	0.38	0.38	0.38	0.35	0.35	0.06	0.23	0.23	0.03	0.20	0.20	
Capacity (c), veh/h	128	1285	586	574	613	535	99	380	341	50	349	291	
Volume-to-Capacity Ratio (X)	0.783	0.156	0.114	0.058	0.092	0.102	0.670	0.366	0.212	0.558	0.255	0.084	
Back of Queue (Q), ft/ln (95 th percentile)													
Back of Queue (Q), veh/ln (95 th percentile)	1.9	0.9	0.7	0.3	0.6	0.6	1.3	1.9	0.9	0.6	1.2	0.3	
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Uniform Delay (d_1), s/veh	22.7	10.1	9.9	9.7	11.0	11.1	23.0	16.3	15.7	23.9	16.9	16.3	
Incremental Delay (d_2), s/veh	3.9	0.3	0.4	0.0	0.3	0.4	2.9	0.2	0.1	3.6	0.1	0.0	
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Control Delay (d), s/veh	26.7	10.3	10.3	9.8	11.3	11.5	25.9	16.5	15.8	27.5	17.1	16.4	
Level of Service (LOS)	C	B	B	A	B	B	C	B	B	C	B	B	
Approach Delay, s/veh / LOS	14.8	B		11.0		B		18.6	B		19.0	B	
Intersection Delay, s/veh / LOS	16.0						B						

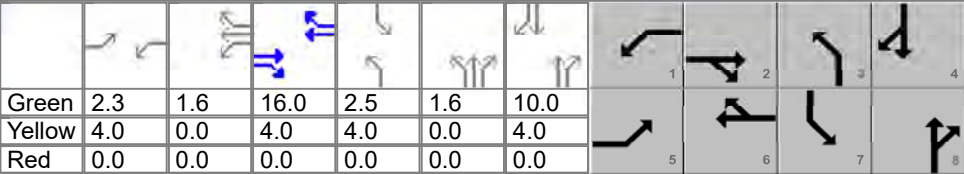
Multimodal Results

	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	2.08	B		2.08	B		2.27	B		2.42	B	
Bicycle LOS Score / LOS	0.79	A		0.61	A		0.95	A		0.72	A	

HCS Signalized Intersection Results Summary

General Information						Intersection Information		
Agency	HRG					Duration, h	0.250	
Analyst	MJV	Analysis Date	Dec 28, 2022			Area Type	Other	
Jurisdiction	SDDOT	Time Period	AM Peak			PHF	0.90	
Urban Street	SD 38	Analysis Year	2022			Analysis Period	1> 16:45	
Intersection	SD 38 & Marion Street	File Name	(18) SD38&Marion_PM.xus					
Project Description								

Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	40	120	60	95	190	30	100	115	70	45	195	115

Signal Information												
Cycle, s	50.0	Reference Phase	2	Green	2.3	1.6	16.0	2.5	1.6	10.0		
Offset, s	0	Reference Point	End	Yellow	4.0	0.0	4.0	4.0	0.0	4.0		
Uncoordinated	No	Simult. Gap E/W	On	Red	0.0	0.0	0.0	0.0	0.0	0.0		
Force Mode	Fixed	Simult. Gap N/S	On									

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0
Phase Duration, s	6.3	20.0	7.9	21.6	8.1	15.6	6.5	14.0
Change Period, ($Y+R_c$), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Allow Headway (MAH), s	2.9	0.0	2.9	0.0	2.9	3.0	2.9	3.0
Queue Clearance Time (g_s), s	3.5		5.1		5.2	5.0	3.5	7.6
Green Extension Time (g_e), s	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.5
Phase Call Probability	0.46		0.77		0.79	1.00	0.50	1.00
Max Out Probability	0.06		1.00		1.00	0.02	1.00	0.32

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	44	133	67	106	211	33	111	128	78	50	217	128
Adjusted Saturation Flow Rate (s), veh/h/ln	1474	1660	1490	1688	1772	1406	1714	1772	1478	1688	1772	1478
Queue Service Time (g_s), s	1.5	1.4	1.6	3.1	4.4	0.8	3.2	3.0	2.1	1.5	5.6	3.8
Cycle Queue Clearance Time (g_c), s	1.5	1.4	1.6	3.1	4.4	0.8	3.2	3.0	2.1	1.5	5.6	3.8
Green Ratio (g/C)	0.05	0.32	0.32	0.08	0.35	0.35	0.08	0.23	0.23	0.05	0.20	0.20
Capacity (c), veh/h	68	1062	477	133	624	496	140	410	342	84	354	295
Volume-to-Capacity Ratio (X)	0.655	0.126	0.140	0.796	0.338	0.067	0.795	0.312	0.227	0.592	0.612	0.432
Back of Queue (Q), ft/ln (95 th percentile)												
Back of Queue (Q), veh/ln (95 th percentile)	0.9	0.7	0.8	2.0	2.6	0.4	2.6	1.7	1.0	1.0	3.3	1.8
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	23.5	12.0	12.1	22.6	11.9	10.7	22.5	15.9	15.6	23.2	18.2	17.5
Incremental Delay (d_2), s/veh	3.9	0.2	0.6	4.1	1.5	0.3	10.9	0.2	0.1	2.4	0.6	0.4
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	27.4	12.3	12.7	26.7	13.4	11.0	33.4	16.1	15.7	25.7	18.9	17.9
Level of Service (LOS)	C	B	B	C	B	B	C	B	B	C	B	B
Approach Delay, s/veh / LOS	15.2	B		17.2	B		22.1	C		19.4	B	
Intersection Delay, s/veh / LOS	18.7						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.09	B	2.08	B	2.27	B	2.27	B
Bicycle LOS Score / LOS	0.69	A	1.07	A	1.01	A	1.14	A

HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	12/27/2022
Agency	HRG	Analysis Year	2022
Jurisdiction	SDDOT	Time Analyzed	AM PEAK
Project Description	EB SD38 Corridor Study	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1084
Measured FFS	Measured	Free-Flow Speed, mi/h	55.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	361	Opposing Demand Flow Rate, veh/h	217
Peak Hour Factor	0.90	Total Trucks, %	2.16
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.21

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.0
Speed Slope Coefficient (m)	4.32483	Speed Power Coefficient (p)	0.53470
PF Slope Coefficient (m)	-1.32929	PF Power Coefficient (p)	0.76724
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.1
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1084	-	-	52.9

Vehicle Results

Average Speed, mi/h	52.9	Percent Followers, %	45.6
Segment Travel Time, minutes	0.23	Follower Density (FD), followers/mi/ln	3.1
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	361	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.69	Bicycle Effective Speed Factor	4.62
Bicycle LOS	C		

Segment 2

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	507
Measured FFS	Measured	Free-Flow Speed, mi/h	55.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		361	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		2.16
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.21
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		55.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.43973	PF Power Coefficient (p)		0.72475
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		3.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	507	-	-	52.4
Vehicle Results					
Average Speed, mi/h		52.4	Percent Followers, %		49.7
Segment Travel Time, minutes		0.11	Follower Density (FD), followers/mi/ln		3.4
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		361	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.69	Bicycle Effective Speed Factor		4.62
Bicycle LOS		C			
Segment 3					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		535
Measured FFS		Measured	Free-Flow Speed, mi/h		55.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		361	Opposing Demand Flow Rate, veh/h		217
Peak Hour Factor		0.90	Total Trucks, %		2.16
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.21
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		55.0
Speed Slope Coefficient (m)		4.32483	Speed Power Coefficient (p)		0.53470
PF Slope Coefficient (m)		-1.32929	PF Power Coefficient (p)		0.76724
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		3.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	535	-	-	52.9

Vehicle Results

Average Speed, mi/h	52.9	Percent Followers, %	45.6
Segment Travel Time, minutes	0.11	Follower Density (FD), followers/mi/ln	3.1
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	361	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.69	Bicycle Effective Speed Factor	4.62
Bicycle LOS	C		

Segment 4

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1494
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	411	Opposing Demand Flow Rate, veh/h	217
Peak Hour Factor	0.90	Total Trucks, %	1.63
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.24

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.32812	Speed Power Coefficient (p)	0.53470
PF Slope Coefficient (m)	-1.23337	PF Power Coefficient (p)	0.80913
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.7
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1494	-	-	67.7

Vehicle Results

Average Speed, mi/h	67.7	Percent Followers, %	45.2
Segment Travel Time, minutes	0.25	Follower Density (FD), followers/mi/ln	2.7
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	411	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.76	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		5762
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		411	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		1.63
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.24
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.62977	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.20069	PF Power Coefficient (p)		0.78591
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.8
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5762	-	-	67.2
Vehicle Results					
Average Speed, mi/h		67.2	Percent Followers, %		45.0
Segment Travel Time, minutes		0.98	Follower Density (FD), followers/mi/ln		2.8
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		411	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.76	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		383
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		411	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		1.89
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.24
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29361	PF Power Coefficient (p)	0.75772
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	383	-	-	67.2

Vehicle Results			
Average Speed, mi/h	67.2	Percent Followers, %	48.3
Segment Travel Time, minutes	0.06	Follower Density (FD), followers/mi/ln	3.0
Vehicle LOS	B		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	411	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.82	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 7

Vehicle Inputs			
Segment Type	Passing Constrained	Length, ft	1485
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	417	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	3.19
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.25

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57684	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.28453	PF Power Coefficient (p)	0.76145
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1485	-	-	67.2

Vehicle Results			
Average Speed, mi/h	67.2	Percent Followers, %	48.3
Segment Travel Time, minutes	0.25	Follower Density (FD), followers/mi/ln	3.0
Vehicle LOS	B		

Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		417	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.18	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 8					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		426
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		189	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		6.47
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.11
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29307	PF Power Coefficient (p)		0.75839
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.8
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	426	-	-	68.3
Vehicle Results					
Average Speed, mi/h		68.3	Percent Followers, %		30.6
Segment Travel Time, minutes		0.07	Follower Density (FD), followers/mi/ln		0.8
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		189	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.81	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 9					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1212
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					

Directional Demand Flow Rate, veh/h		211	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.12
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29321	PF Power Coefficient (p)		0.75821
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.0
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1212	-	-	68.2
Vehicle Results					
Average Speed, mi/h		68.2	Percent Followers, %		32.8
Segment Travel Time, minutes		0.20	Follower Density (FD), followers/mi/ln		1.0
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		211	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.46	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1877
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		211	Opposing Demand Flow Rate, veh/h		150
Peak Hour Factor		0.90	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.12
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.30911	Speed Power Coefficient (p)		0.55474
PF Slope Coefficient (m)		-1.20061	PF Power Coefficient (p)		0.82238
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.9
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	1877	-	-	68.7
Vehicle Results					
Average Speed, mi/h		68.7	Percent Followers, %		28.4
Segment Travel Time, minutes		0.31	Follower Density (FD), followers/mi/ln		0.9
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		211	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.46	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1872
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		211	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.12
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.58354	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.26676	PF Power Coefficient (p)		0.76864
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.0
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1872	-	-	68.2
Vehicle Results					
Average Speed, mi/h		68.2	Percent Followers, %		31.8
Segment Travel Time, minutes		0.31	Follower Density (FD), followers/mi/ln		1.0
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		211	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.46	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 12					

Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		3603
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		211	Opposing Demand Flow Rate, veh/h		150
Peak Hour Factor		0.90	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.12
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.33276	Speed Power Coefficient (p)		0.55474
PF Slope Coefficient (m)		-1.15781	PF Power Coefficient (p)		0.83977
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.8
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3603	-	-	68.7
Vehicle Results					
Average Speed, mi/h		68.7	Percent Followers, %		26.9
Segment Travel Time, minutes		0.60	Follower Density (FD), followers/mi/ln		0.8
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		211	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.46	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1053
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		211	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.12
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29321	PF Power Coefficient (p)		0.75821

In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.0
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1053	-	-	68.2
Vehicle Results					
Average Speed, mi/h		68.2	Percent Followers, %		32.8
Segment Travel Time, minutes		0.18	Follower Density (FD), followers/mi/ln		1.0
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		211	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.46	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 14					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1120
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		211	Opposing Demand Flow Rate, veh/h		150
Peak Hour Factor		0.90	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.12
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.29921	Speed Power Coefficient (p)		0.55474
PF Slope Coefficient (m)		-1.22576	PF Power Coefficient (p)		0.81100
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.9
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1120	-	-	68.7
Vehicle Results					
Average Speed, mi/h		68.7	Percent Followers, %		29.3
Segment Travel Time, minutes		0.19	Follower Density (FD), followers/mi/ln		0.9
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4

Flow Rate Outside Lane, veh/h	211	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.46	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 15

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1272
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	239	Opposing Demand Flow Rate, veh/h	161
Peak Hour Factor	0.90	Total Trucks, %	5.09
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.14

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.30382	Speed Power Coefficient (p)	0.55102
PF Slope Coefficient (m)	-1.22883	PF Power Coefficient (p)	0.81000
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.1
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1272	-	-	68.5

Vehicle Results

Average Speed, mi/h	68.5	Percent Followers, %	32.0
Segment Travel Time, minutes	0.21	Follower Density (FD), followers/mi/ln	1.1
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	239	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.47	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 16

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	625
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	239	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	5.09
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.14

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29323	PF Power Coefficient (p)	0.75819
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	625	-	-	68.0

Vehicle Results			
Average Speed, mi/h	68.0	Percent Followers, %	35.4
Segment Travel Time, minutes	0.10	Follower Density (FD), followers/mi/ln	1.2
Vehicle LOS	A		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	239	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.47	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 17

Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	1995
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	239	Opposing Demand Flow Rate, veh/h	161
Peak Hour Factor	0.90	Total Trucks, %	5.09
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.14

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.31563	Speed Power Coefficient (p)	0.55102
PF Slope Coefficient (m)	-1.19928	PF Power Coefficient (p)	0.82326
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.1
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1995	-	-	68.5

Vehicle Results			
Average Speed, mi/h	68.5	Percent Followers, %	30.9

Segment Travel Time, minutes		0.33	Follower Density (FD), followers/mi/ln		1.1
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		239	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.47	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 18					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1399
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		239	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		5.09
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.14
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57524	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.28884	PF Power Coefficient (p)		0.75993
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1399	-	-	68.0
Vehicle Results					
Average Speed, mi/h		68.0	Percent Followers, %		35.2
Segment Travel Time, minutes		0.23	Follower Density (FD), followers/mi/ln		1.2
Vehicle LOS		A			

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	239	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.47	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		
Segment 19			
Vehicle Inputs			
Segment Type	Passing Constrained	Length, ft	1254
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity							
Directional Demand Flow Rate, veh/h		444		Opposing Demand Flow Rate, veh/h		-	
Peak Hour Factor		0.90		Total Trucks, %		1.51	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.26	
Intermediate Results							
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0	
Speed Slope Coefficient (m)		4.57372		Speed Power Coefficient (p)		0.41674	
PF Slope Coefficient (m)		-1.29366		PF Power Coefficient (p)		0.75766	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		3.3	
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0	
Subsegment Data							
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h		
1	Tangent	1254	-	-	67.1		
Vehicle Results							
Average Speed, mi/h		67.1		Percent Followers, %		50.3	
Segment Travel Time, minutes		0.21		Follower Density (FD), followers/mi/ln		3.3	
Vehicle LOS		B					
Bicycle Results							
Percent Occupied Parking		0		Pavement Condition Rating		4	
Flow Rate Outside Lane, veh/h		444		Bicycle Effective Width, ft		24	
Bicycle LOS Score		2.77		Bicycle Effective Speed Factor		5.07	
Bicycle LOS		C					
Segment 20							
Vehicle Inputs							
Segment Type		Passing Zone		Length, ft		1108	
Measured FFS		Measured		Free-Flow Speed, mi/h		70.0	
Demand and Capacity							
Directional Demand Flow Rate, veh/h		444		Opposing Demand Flow Rate, veh/h		150	
Peak Hour Factor		0.90		Total Trucks, %		1.51	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.26	
Intermediate Results							
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0	
Speed Slope Coefficient (m)		4.29921		Speed Power Coefficient (p)		0.55474	
PF Slope Coefficient (m)		-1.22617		PF Power Coefficient (p)		0.81043	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		3.1	
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0	
Subsegment Data							

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1108	-	-	67.6

Vehicle Results

Average Speed, mi/h	67.6	Percent Followers, %	47.0
Segment Travel Time, minutes	0.19	Follower Density (FD), followers/mi/ln	3.1
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	444	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.77	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 21

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	2901
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	444	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	1.51
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.26

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.59854	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.23554	PF Power Coefficient (p)	0.77974
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2901	-	-	67.1

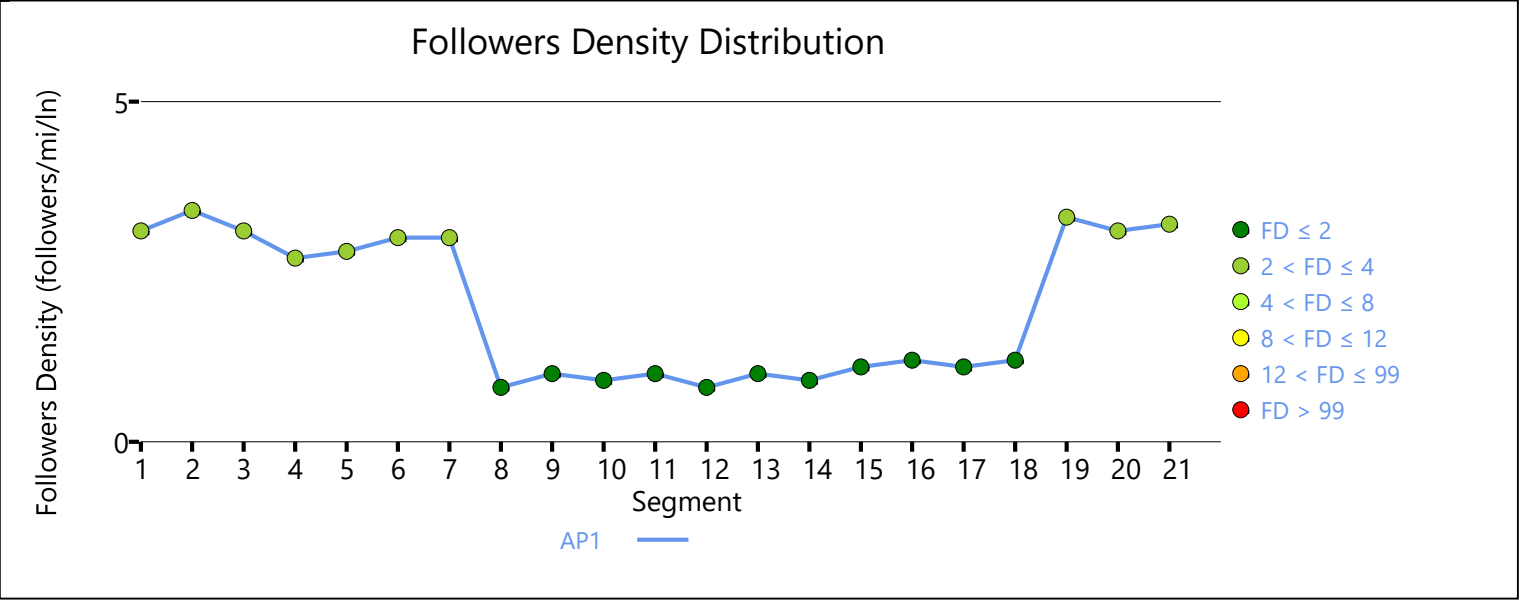
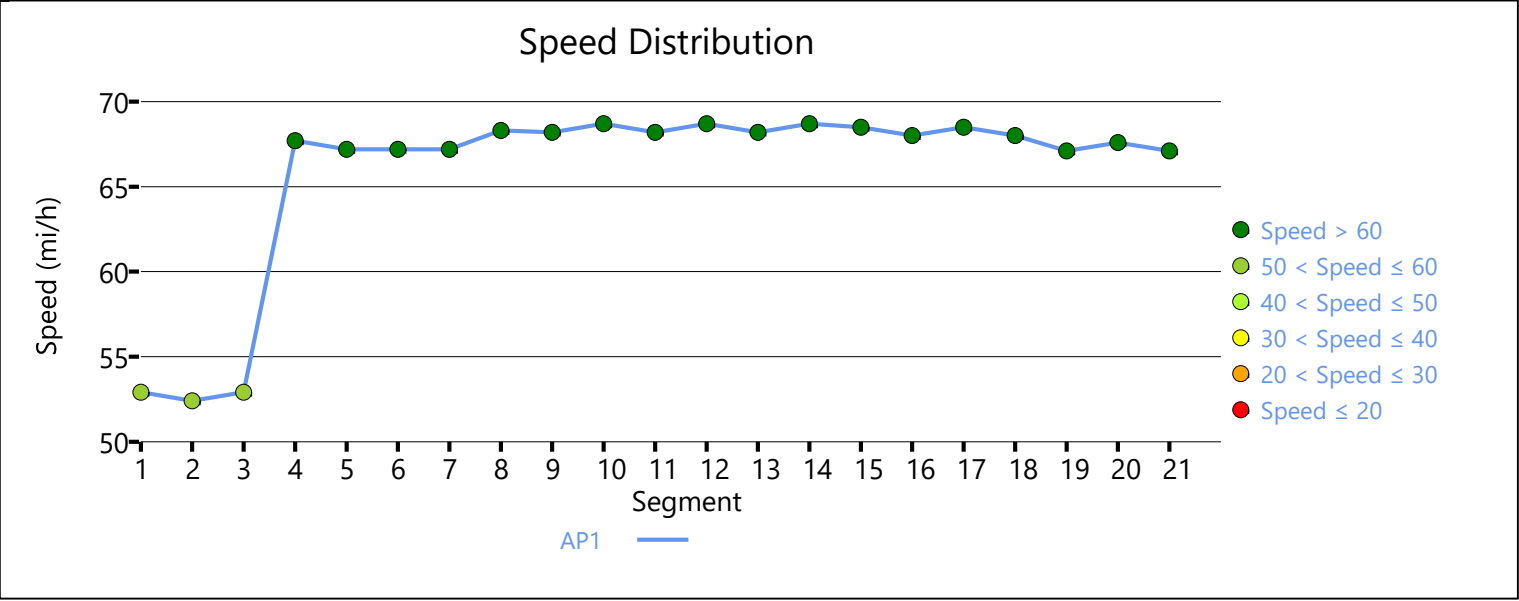
Vehicle Results

Average Speed, mi/h	67.1	Percent Followers, %	48.1
Segment Travel Time, minutes	0.49	Follower Density (FD), followers/mi/ln	3.2
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	444	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.77	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Facility Results				
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	446	0.23	2.0	A



HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	12/27/2022
Agency	HRG	Analysis Year	2022
Jurisdiction	SDDOT	Time Analyzed	PM PEAK
Project Description	EB SD38 Corridor Study	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1084
Measured FFS	Measured	Free-Flow Speed, mi/h	55.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	228	Opposing Demand Flow Rate, veh/h	417
Peak Hour Factor	0.90	Total Trucks, %	5.39
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.13

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.0
Speed Slope Coefficient (m)	4.38384	Speed Power Coefficient (p)	0.49415
PF Slope Coefficient (m)	-1.36983	PF Power Coefficient (p)	0.75777
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.5
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1084	-	-	53.4

Vehicle Results

Average Speed, mi/h	53.4	Percent Followers, %	36.0
Segment Travel Time, minutes	0.23	Follower Density (FD), followers/mi/ln	1.5
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	228	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.32	Bicycle Effective Speed Factor	4.62
Bicycle LOS	C		

Segment 2

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	507
Measured FFS	Measured	Free-Flow Speed, mi/h	55.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		228	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		5.39
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.13
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		55.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.43930	PF Power Coefficient (p)		0.72520
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	507	-	-	53.1
Vehicle Results					
Average Speed, mi/h		53.1	Percent Followers, %		38.9
Segment Travel Time, minutes		0.11	Follower Density (FD), followers/mi/ln		1.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		228	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.32	Bicycle Effective Speed Factor		4.62
Bicycle LOS		C			
Segment 3					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		535
Measured FFS		Measured	Free-Flow Speed, mi/h		55.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		228	Opposing Demand Flow Rate, veh/h		417
Peak Hour Factor		0.90	Total Trucks, %		5.39
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.13
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		55.0
Speed Slope Coefficient (m)		4.38384	Speed Power Coefficient (p)		0.49415
PF Slope Coefficient (m)		-1.36983	PF Power Coefficient (p)		0.75777
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	535	-	-	53.4

Vehicle Results

Average Speed, mi/h	53.4	Percent Followers, %	36.0
Segment Travel Time, minutes	0.11	Follower Density (FD), followers/mi/ln	1.5
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	228	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.32	Bicycle Effective Speed Factor	4.62
Bicycle LOS	C		

Segment 4

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1494
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	222	Opposing Demand Flow Rate, veh/h	500
Peak Hour Factor	0.90	Total Trucks, %	8.42
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.13

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.40733	Speed Power Coefficient (p)	0.48207
PF Slope Coefficient (m)	-1.27021	PF Power Coefficient (p)	0.79452
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1494	-	-	68.4

Vehicle Results

Average Speed, mi/h	68.4	Percent Followers, %	31.9
Segment Travel Time, minutes	0.25	Follower Density (FD), followers/mi/ln	1.0
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	222	Bicycle Effective Width, ft	24
Bicycle LOS Score	4.62	Bicycle Effective Speed Factor	5.07
Bicycle LOS	E		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		5762
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		222	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		8.42
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.13
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.62977	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.19994	PF Power Coefficient (p)		0.78694
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.0
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5762	-	-	68.1
Vehicle Results					
Average Speed, mi/h		68.1	Percent Followers, %		30.7
Segment Travel Time, minutes		0.96	Follower Density (FD), followers/mi/ln		1.0
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		222	Bicycle Effective Width, ft		24
Bicycle LOS Score		4.62	Bicycle Effective Speed Factor		5.07
Bicycle LOS		E			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		383
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		228	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		8.78
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.13
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29280	PF Power Coefficient (p)	0.75872
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.1
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	383	-	-	68.1

Vehicle Results			
Average Speed, mi/h	68.1	Percent Followers, %	34.3
Segment Travel Time, minutes	0.06	Follower Density (FD), followers/mi/ln	1.1
Vehicle LOS	A		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	228	Bicycle Effective Width, ft	24
Bicycle LOS Score	4.78	Bicycle Effective Speed Factor	5.07
Bicycle LOS	E		

Segment 7

Vehicle Inputs			
Segment Type	Passing Constrained	Length, ft	1485
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	250	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	8.52
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.15

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57684	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.28391	PF Power Coefficient (p)	0.76223
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1485	-	-	67.9

Vehicle Results			
Average Speed, mi/h	67.9	Percent Followers, %	36.0
Segment Travel Time, minutes	0.25	Follower Density (FD), followers/mi/ln	1.3
Vehicle LOS	A		

Bicycle Results					
Percent Occupied Parking	0	Pavement Condition Rating	4		
Flow Rate Outside Lane, veh/h	250	Bicycle Effective Width, ft	24		
Bicycle LOS Score	4.72	Bicycle Effective Speed Factor	5.07		
Bicycle LOS	E				
Segment 8					
Vehicle Inputs					
Segment Type	Passing Constrained	Length, ft	426		
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0		
Demand and Capacity					
Directional Demand Flow Rate, veh/h	178	Opposing Demand Flow Rate, veh/h	-		
Peak Hour Factor	0.90	Total Trucks, %	10.56		
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.10		
Intermediate Results					
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0		
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674		
PF Slope Coefficient (m)	-1.29259	PF Power Coefficient (p)	0.75898		
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.8		
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0		
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	426	-	-	68.4
Vehicle Results					
Average Speed, mi/h	68.4	Percent Followers, %	29.4		
Segment Travel Time, minutes	0.07	Follower Density (FD), followers/mi/ln	0.8		
Vehicle LOS	A				
Bicycle Results					
Percent Occupied Parking	0	Pavement Condition Rating	4		
Flow Rate Outside Lane, veh/h	178	Bicycle Effective Width, ft	28		
Bicycle LOS Score	4.36	Bicycle Effective Speed Factor	5.07		
Bicycle LOS	D				
Segment 9					
Vehicle Inputs					
Segment Type	Passing Constrained	Length, ft	1212		
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0		
Demand and Capacity					

Directional Demand Flow Rate, veh/h		183	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		7.27
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.11
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29298	PF Power Coefficient (p)		0.75850
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.8
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1212	-	-	68.4
Vehicle Results					
Average Speed, mi/h		68.4	Percent Followers, %		30.0
Segment Travel Time, minutes		0.20	Follower Density (FD), followers/mi/ln		0.8
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		183	Bicycle Effective Width, ft		24
Bicycle LOS Score		4.08	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1877
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		183	Opposing Demand Flow Rate, veh/h		250
Peak Hour Factor		0.90	Total Trucks, %		7.27
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.11
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.34605	Speed Power Coefficient (p)		0.52632
PF Slope Coefficient (m)		-1.22260	PF Power Coefficient (p)		0.81482
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	1877	-	-	68.8
Vehicle Results					
Average Speed, mi/h		68.8	Percent Followers, %		26.4
Segment Travel Time, minutes		0.31	Follower Density (FD), followers/mi/ln		0.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		183	Bicycle Effective Width, ft		24
Bicycle LOS Score		4.08	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1872
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		183	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		7.27
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.11
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.58354	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.26653	PF Power Coefficient (p)		0.76894
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.8
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1872	-	-	68.4
Vehicle Results					
Average Speed, mi/h		68.4	Percent Followers, %		29.1
Segment Travel Time, minutes		0.31	Follower Density (FD), followers/mi/ln		0.8
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		183	Bicycle Effective Width, ft		24
Bicycle LOS Score		4.08	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 12					

Vehicle Inputs					
Segment Type		Passing Zone		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				3603	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		183		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.90		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.11	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
Speed Slope Coefficient (m)		4.36970		Speed Power Coefficient (p)	
PF Slope Coefficient (m)		-1.17891		PF Power Coefficient (p)	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln	
%Improvement to Percent Followers		0.0		%Improvement to Speed	
				0.0	
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3603	-	-	68.8
Vehicle Results					
Average Speed, mi/h		68.8		Percent Followers, %	
Segment Travel Time, minutes		0.59		Follower Density (FD), followers/mi/ln	
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0		Pavement Condition Rating	
Flow Rate Outside Lane, veh/h		183		Bicycle Effective Width, ft	
Bicycle LOS Score		4.08		Bicycle Effective Speed Factor	
Bicycle LOS		D			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Constrained		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				1053	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		183		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.90		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.11	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
Speed Slope Coefficient (m)		4.57372		Speed Power Coefficient (p)	
PF Slope Coefficient (m)		-1.29298		PF Power Coefficient (p)	
				0.75850	

In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.8
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1053	-	-	68.4
Vehicle Results					
Average Speed, mi/h		68.4	Percent Followers, %		30.0
Segment Travel Time, minutes		0.18	Follower Density (FD), followers/mi/ln		0.8
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		183	Bicycle Effective Width, ft		24
Bicycle LOS Score		4.08	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 14					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1120
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		183	Opposing Demand Flow Rate, veh/h		250
Peak Hour Factor		0.90	Total Trucks, %		7.27
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.11
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.33615	Speed Power Coefficient (p)		0.52632
PF Slope Coefficient (m)		-1.24829	PF Power Coefficient (p)		0.80375
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1120	-	-	68.8
Vehicle Results					
Average Speed, mi/h		68.8	Percent Followers, %		27.3
Segment Travel Time, minutes		0.18	Follower Density (FD), followers/mi/ln		0.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4

Flow Rate Outside Lane, veh/h	183	Bicycle Effective Width, ft	24
Bicycle LOS Score	4.08	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 15

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1272
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	217	Opposing Demand Flow Rate, veh/h	283
Peak Hour Factor	0.90	Total Trucks, %	6.63
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.13

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.34673	Speed Power Coefficient (p)	0.51874
PF Slope Coefficient (m)	-1.25416	PF Power Coefficient (p)	0.80155
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1272	-	-	68.6

Vehicle Results

Average Speed, mi/h	68.6	Percent Followers, %	30.8
Segment Travel Time, minutes	0.21	Follower Density (FD), followers/mi/ln	1.0
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	217	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.94	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 16

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	625
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	217	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	6.63
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.13

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29305	PF Power Coefficient (p)	0.75841
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.1
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	625	-	-	68.1

Vehicle Results			
Average Speed, mi/h	68.1	Percent Followers, %	33.3
Segment Travel Time, minutes	0.10	Follower Density (FD), followers/mi/ln	1.1
Vehicle LOS	A		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	217	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.94	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 17

Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	1995
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	217	Opposing Demand Flow Rate, veh/h	283
Peak Hour Factor	0.90	Total Trucks, %	6.63
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.13

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.35854	Speed Power Coefficient (p)	0.51874
PF Slope Coefficient (m)	-1.22390	PF Power Coefficient (p)	0.81440
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.9
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1995	-	-	68.6

Vehicle Results			
Average Speed, mi/h	68.6	Percent Followers, %	29.7

Segment Travel Time, minutes		0.33	Follower Density (FD), followers/mi/ln		0.9
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		217	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.94	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 18					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1399
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		217	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		6.63
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.13
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57524	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.28865	PF Power Coefficient (p)		0.76016
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1399	-	-	68.1
Vehicle Results					
Average Speed, mi/h		68.1	Percent Followers, %		33.2
Segment Travel Time, minutes		0.23	Follower Density (FD), followers/mi/ln		1.1
Vehicle LOS		A			

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	217	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.94	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		
Segment 19			
Vehicle Inputs			
Segment Type	Passing Constrained	Length, ft	1254
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		217	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		8.67
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.13
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29281	PF Power Coefficient (p)		0.75871
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1254	-	-	68.1
Vehicle Results					
Average Speed, mi/h		68.1	Percent Followers, %		33.3
Segment Travel Time, minutes		0.21	Follower Density (FD), followers/mi/ln		1.1
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		217	Bicycle Effective Width, ft		24
Bicycle LOS Score		4.71	Bicycle Effective Speed Factor		5.07
Bicycle LOS		E			
Segment 20					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1108
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		217	Opposing Demand Flow Rate, veh/h		461
Peak Hour Factor		0.90	Total Trucks, %		8.67
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.13
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.39484	Speed Power Coefficient (p)		0.48746
PF Slope Coefficient (m)		-1.27606	PF Power Coefficient (p)		0.79254
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.0
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1108	-	-	68.5

Vehicle Results

Average Speed, mi/h	68.5	Percent Followers, %	31.6
Segment Travel Time, minutes	0.18	Follower Density (FD), followers/mi/ln	1.0
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	217	Bicycle Effective Width, ft	24
Bicycle LOS Score	4.71	Bicycle Effective Speed Factor	5.07
Bicycle LOS	E		

Segment 21

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	2901
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	217	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	8.67
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.13

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.59854	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.23473	PF Power Coefficient (p)	0.78081
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2901	-	-	68.1

Vehicle Results

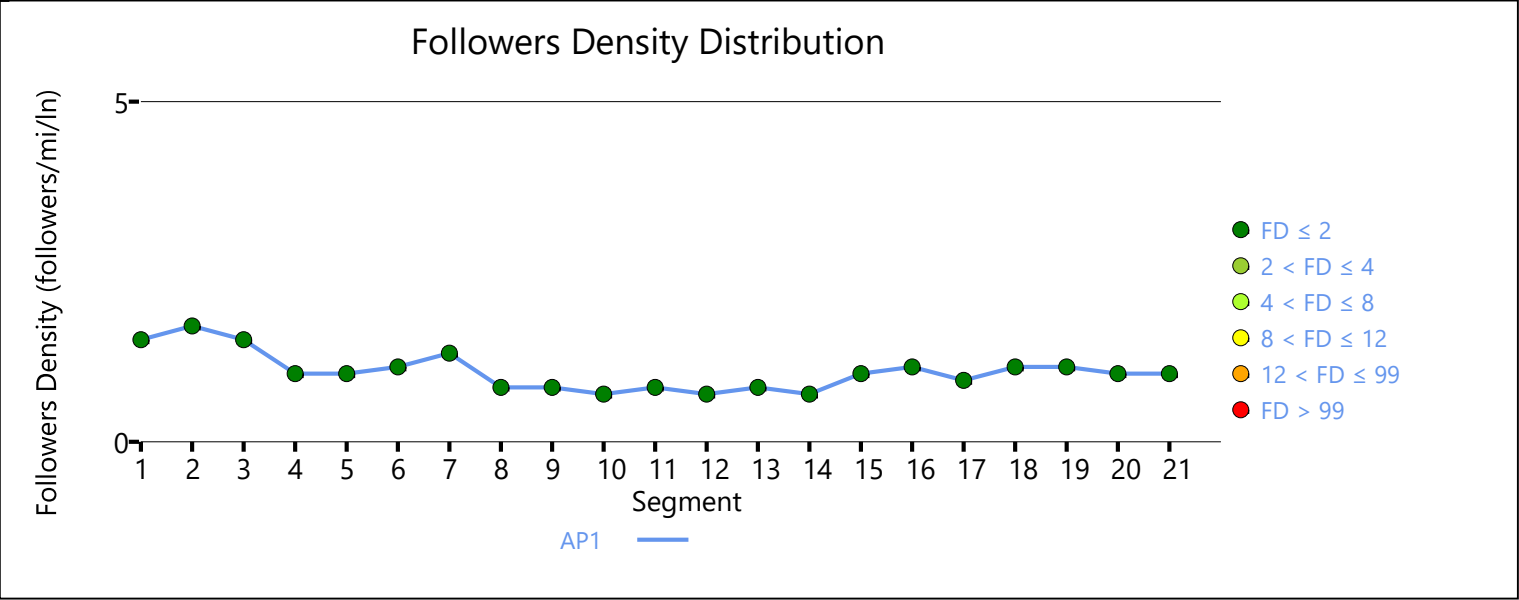
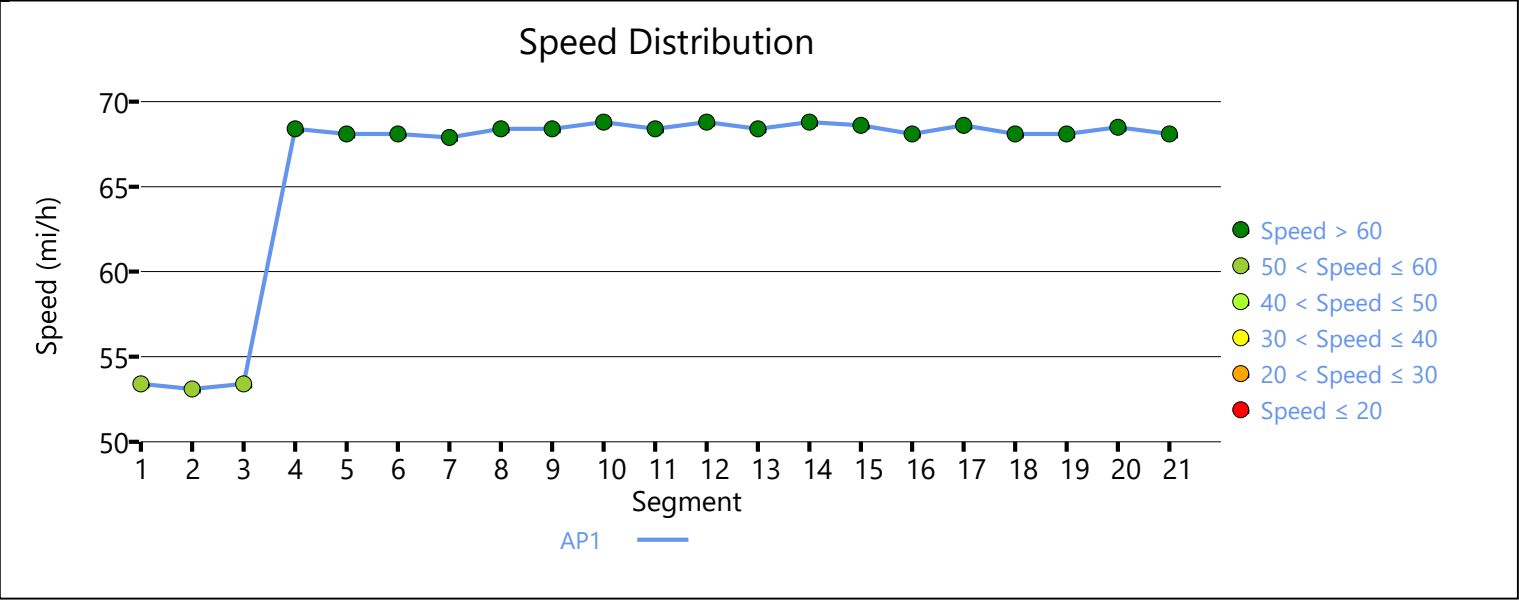
Average Speed, mi/h	68.1	Percent Followers, %	31.2
Segment Travel Time, minutes	0.48	Follower Density (FD), followers/mi/ln	1.0
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	217	Bicycle Effective Width, ft	24
Bicycle LOS Score	4.71	Bicycle Effective Speed Factor	5.07
Bicycle LOS	E		

Facility Results

T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	293	0.11	1.0	A



HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	12/28/2022
Agency	HRG	Analysis Year	2022
Jurisdiction	SDDOT	Time Analyzed	AM Peak
Project Description	West of Hartford SD 38 EB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1069
Measured FFS	Measured	Free-Flow Speed, mi/h	60.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	133	Opposing Demand Flow Rate, veh/h	89
Peak Hour Factor	0.90	Total Trucks, %	5.79
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.08

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.0
Speed Slope Coefficient (m)	4.26998	Speed Power Coefficient (p)	0.57939
PF Slope Coefficient (m)	-1.26431	PF Power Coefficient (p)	0.79173
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.5
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1069	-	-	59.4

Vehicle Results

Average Speed, mi/h	59.4	Percent Followers, %	22.6
Segment Travel Time, minutes	0.20	Follower Density (FD), followers/mi/ln	0.5
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	133	Bicycle Effective Width, ft	31
Bicycle LOS Score	1.33	Bicycle Effective Speed Factor	4.79
Bicycle LOS	A		

Segment 2

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	664
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		133	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		5.79
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.08
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29315	PF Power Coefficient (p)		0.75829
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	664	-	-	68.9
Vehicle Results					
Average Speed, mi/h		68.9	Percent Followers, %		24.5
Segment Travel Time, minutes		0.11	Follower Density (FD), followers/mi/ln		0.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		133	Bicycle Effective Width, ft		31
Bicycle LOS Score		1.47	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 3					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1871
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		133	Opposing Demand Flow Rate, veh/h		89
Peak Hour Factor		0.90	Total Trucks, %		5.79
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.08
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.27979	Speed Power Coefficient (p)		0.57939
PF Slope Coefficient (m)		-1.18064	PF Power Coefficient (p)		0.82894
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1871	-	-	69.4

Vehicle Results

Average Speed, mi/h	69.4	Percent Followers, %	19.9
Segment Travel Time, minutes	0.31	Follower Density (FD), followers/mi/ln	0.4
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	133	Bicycle Effective Width, ft	31
Bicycle LOS Score	1.47	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 4

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	925
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	133	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	5.79
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.08

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29315	PF Power Coefficient (p)	0.75829
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.5
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	925	-	-	68.9

Vehicle Results

Average Speed, mi/h	68.9	Percent Followers, %	24.5
Segment Travel Time, minutes	0.15	Follower Density (FD), followers/mi/ln	0.5
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	133	Bicycle Effective Width, ft	31
Bicycle LOS Score	1.47	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft	4476	
Measured FFS		Measured	Free-Flow Speed, mi/h	70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		133	Opposing Demand Flow Rate, veh/h		89
Peak Hour Factor		0.90	Total Trucks, %		5.79
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.08
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.31327	Speed Power Coefficient (p)		0.57939
PF Slope Coefficient (m)		-1.12762	PF Power Coefficient (p)		0.84992
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	4476	-	-	69.4
Vehicle Results					
Average Speed, mi/h		69.4	Percent Followers, %		18.4
Segment Travel Time, minutes		0.73	Follower Density (FD), followers/mi/ln		0.4
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		133	Bicycle Effective Width, ft		31
Bicycle LOS Score		1.47	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft	896	
Measured FFS		Measured	Free-Flow Speed, mi/h	70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		133	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		5.79
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.08
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29315	PF Power Coefficient (p)	0.75829
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.5
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	896	-	-	68.9

Vehicle Results

Average Speed, mi/h	68.9	Percent Followers, %	24.5
Segment Travel Time, minutes	0.15	Follower Density (FD), followers/mi/ln	0.5
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	133	Bicycle Effective Width, ft	31
Bicycle LOS Score	1.47	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 7

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	743
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	133	Opposing Demand Flow Rate, veh/h	89
Peak Hour Factor	0.90	Total Trucks, %	5.79
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.08

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.26998	Speed Power Coefficient (p)	0.57939
PF Slope Coefficient (m)	-1.20509	PF Power Coefficient (p)	0.81737
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.4
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	743	-	-	69.4

Vehicle Results

Average Speed, mi/h	69.4	Percent Followers, %	20.7
Segment Travel Time, minutes	0.12	Follower Density (FD), followers/mi/ln	0.4
Vehicle LOS	A		

Bicycle Results					
Percent Occupied Parking	0	Pavement Condition Rating	4		
Flow Rate Outside Lane, veh/h	133	Bicycle Effective Width, ft	31		
Bicycle LOS Score	1.47	Bicycle Effective Speed Factor	5.07		
Bicycle LOS	A				
Segment 8					
Vehicle Inputs					
Segment Type	Passing Zone	Length, ft	2717		
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0		
Demand and Capacity					
Directional Demand Flow Rate, veh/h	133	Opposing Demand Flow Rate, veh/h	89		
Peak Hour Factor	0.90	Total Trucks, %	3.28		
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.08		
Intermediate Results					
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0		
Speed Slope Coefficient (m)	4.29235	Speed Power Coefficient (p)	0.57939		
PF Slope Coefficient (m)	-1.15570	PF Power Coefficient (p)	0.83991		
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.4		
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0		
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2717	-	-	69.4
Vehicle Results					
Average Speed, mi/h	69.4	Percent Followers, %	19.2		
Segment Travel Time, minutes	0.44	Follower Density (FD), followers/mi/ln	0.4		
Vehicle LOS	A				
Bicycle Results					
Percent Occupied Parking	0	Pavement Condition Rating	4		
Flow Rate Outside Lane, veh/h	133	Bicycle Effective Width, ft	31		
Bicycle LOS Score	0.70	Bicycle Effective Speed Factor	5.07		
Bicycle LOS	A				
Segment 9					
Vehicle Inputs					
Segment Type	Passing Constrained	Length, ft	1013		
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0		
Demand and Capacity					

Directional Demand Flow Rate, veh/h		133	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		3.28
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.08
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29345	PF Power Coefficient (p)		0.75792
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1013	-	-	68.9
Vehicle Results					
Average Speed, mi/h		68.9	Percent Followers, %		24.5
Segment Travel Time, minutes		0.17	Follower Density (FD), followers/mi/ln		0.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		133	Bicycle Effective Width, ft		31
Bicycle LOS Score		0.70	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		4569
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		133	Opposing Demand Flow Rate, veh/h		89
Peak Hour Factor		0.90	Total Trucks, %		3.28
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.08
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.31425	Speed Power Coefficient (p)		0.57939
PF Slope Coefficient (m)		-1.12699	PF Power Coefficient (p)		0.84968
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	4569	-	-	69.4
Vehicle Results					
Average Speed, mi/h		69.4	Percent Followers, %		18.4
Segment Travel Time, minutes		0.75	Follower Density (FD), followers/mi/ln		0.4
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		133	Bicycle Effective Width, ft		31
Bicycle LOS Score		0.70	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		5676
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		133	Opposing Demand Flow Rate, veh/h		89
Peak Hour Factor		0.90	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.08
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.32522	Speed Power Coefficient (p)		0.57939
PF Slope Coefficient (m)		-1.11957	PF Power Coefficient (p)		0.84944
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5676	-	-	69.4
Vehicle Results					
Average Speed, mi/h		69.4	Percent Followers, %		18.3
Segment Travel Time, minutes		0.93	Follower Density (FD), followers/mi/ln		0.4
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		133	Bicycle Effective Width, ft		31
Bicycle LOS Score		0.57	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 12					

Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		657
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		156	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29350	PF Power Coefficient (p)		0.75785
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	657	-	-	68.6
Vehicle Results					
Average Speed, mi/h		68.6	Percent Followers, %		27.1
Segment Travel Time, minutes		0.11	Follower Density (FD), followers/mi/ln		0.6
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		156	Bicycle Effective Width, ft		29
Bicycle LOS Score		1.25	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		6009
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		156	Opposing Demand Flow Rate, veh/h		100
Peak Hour Factor		0.90	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.33423	Speed Power Coefficient (p)		0.57423
PF Slope Coefficient (m)		-1.12228	PF Power Coefficient (p)		0.84725

In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.5
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	6009	-	-	69.2

Vehicle Results

Average Speed, mi/h	69.2	Percent Followers, %	20.7
Segment Travel Time, minutes	0.99	Follower Density (FD), followers/mi/ln	0.5
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	156	Bicycle Effective Width, ft	29
Bicycle LOS Score	1.25	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 14

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	891
Measured FFS	Measured	Free-Flow Speed, mi/h	50.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	156	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	2.82
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.09

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	50.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.47375	PF Power Coefficient (p)	0.71164
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	891	-	-	48.6

Vehicle Results

Average Speed, mi/h	48.6	Percent Followers, %	32.4
Segment Travel Time, minutes	0.21	Follower Density (FD), followers/mi/ln	1.0
Vehicle LOS	A		

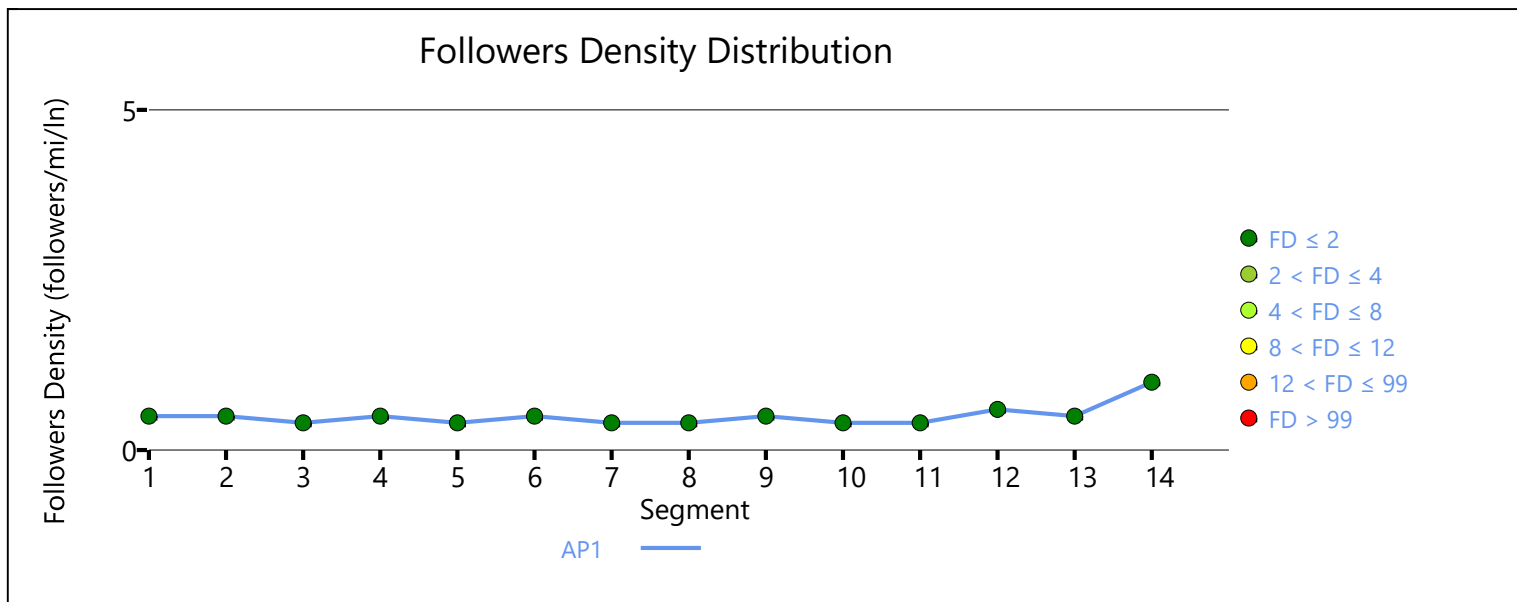
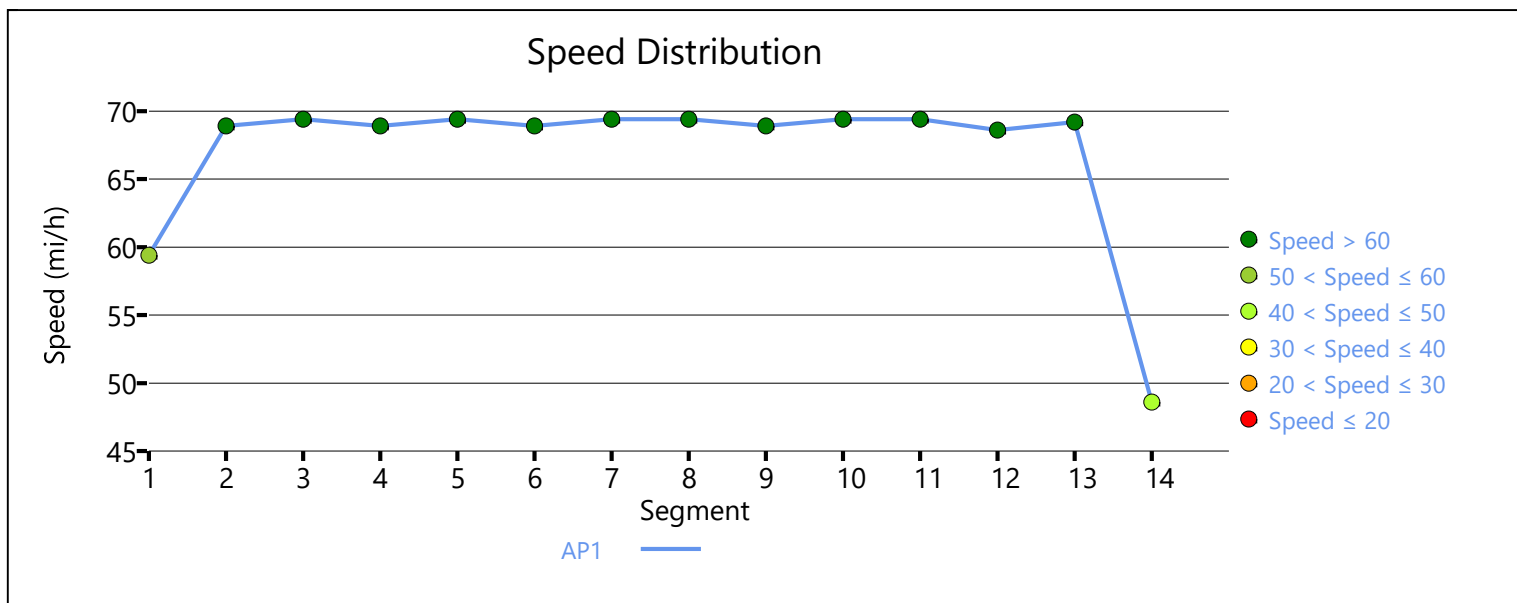
Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
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Flow Rate Outside Lane, veh/h	156	Bicycle Effective Width, ft	29
Bicycle LOS Score	1.03	Bicycle Effective Speed Factor	4.42
Bicycle LOS	A		

Facility Results

T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	190	0.03	0.4	A



HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	3/13/2023
Agency	HRG	Analysis Year	2022
Jurisdiction	SDDOT	Time Analyzed	PM Peak
Project Description	West of Hartford SD 38 EB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1069
Measured FFS	Measured	Free-Flow Speed, mi/h	60.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	83	Opposing Demand Flow Rate, veh/h	156
Peak Hour Factor	0.90	Total Trucks, %	10.67
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.05

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.0
Speed Slope Coefficient (m)	4.30154	Speed Power Coefficient (p)	0.55285
PF Slope Coefficient (m)	-1.28890	PF Power Coefficient (p)	0.78639
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1069	-	-	60.0

Vehicle Results

Average Speed, mi/h	60.0	Percent Followers, %	16.7
Segment Travel Time, minutes	0.20	Follower Density (FD), followers/mi/ln	0.2
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	83	Bicycle Effective Width, ft	35
Bicycle LOS Score	1.57	Bicycle Effective Speed Factor	4.79
Bicycle LOS	B		

Segment 2

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	664
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		83	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		10.67
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.05
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29258	PF Power Coefficient (p)		0.75900
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	664	-	-	70.0
Vehicle Results					
Average Speed, mi/h		70.0	Percent Followers, %		17.8
Segment Travel Time, minutes		0.11	Follower Density (FD), followers/mi/ln		0.2
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		83	Bicycle Effective Width, ft		35
Bicycle LOS Score		1.82	Bicycle Effective Speed Factor		5.07
Bicycle LOS		B			
Segment 3					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1871
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		83	Opposing Demand Flow Rate, veh/h		156
Peak Hour Factor		0.90	Total Trucks, %		10.67
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.05
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.31134	Speed Power Coefficient (p)		0.55285
PF Slope Coefficient (m)		-1.20176	PF Power Coefficient (p)		0.82259
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1871	-	-	70.0

Vehicle Results

Average Speed, mi/h	70.0	Percent Followers, %	14.4
Segment Travel Time, minutes	0.30	Follower Density (FD), followers/mi/ln	0.2
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	83	Bicycle Effective Width, ft	35
Bicycle LOS Score	1.82	Bicycle Effective Speed Factor	5.07
Bicycle LOS	B		

Segment 4

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	925
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	83	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	10.67
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.05

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29258	PF Power Coefficient (p)	0.75900
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	925	-	-	70.0

Vehicle Results

Average Speed, mi/h	70.0	Percent Followers, %	17.8
Segment Travel Time, minutes	0.15	Follower Density (FD), followers/mi/ln	0.2
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	83	Bicycle Effective Width, ft	35
Bicycle LOS Score	1.82	Bicycle Effective Speed Factor	5.07
Bicycle LOS	B		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		4476
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		83	Opposing Demand Flow Rate, veh/h		156
Peak Hour Factor		0.90	Total Trucks, %		10.67
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.05
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.34483	Speed Power Coefficient (p)		0.55285
PF Slope Coefficient (m)		-1.14766	PF Power Coefficient (p)		0.84290
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	4476	-	-	70.0
Vehicle Results					
Average Speed, mi/h		70.0	Percent Followers, %		13.2
Segment Travel Time, minutes		0.73	Follower Density (FD), followers/mi/ln		0.2
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		83	Bicycle Effective Width, ft		35
Bicycle LOS Score		1.82	Bicycle Effective Speed Factor		5.07
Bicycle LOS		B			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		896
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		83	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		10.67
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.05
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29258	PF Power Coefficient (p)	0.75900
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	896	-	-	70.0

Vehicle Results

Average Speed, mi/h	70.0	Percent Followers, %	17.8
Segment Travel Time, minutes	0.15	Follower Density (FD), followers/mi/ln	0.2
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	83	Bicycle Effective Width, ft	35
Bicycle LOS Score	1.82	Bicycle Effective Speed Factor	5.07
Bicycle LOS	B		

Segment 7

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	743
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	83	Opposing Demand Flow Rate, veh/h	156
Peak Hour Factor	0.90	Total Trucks, %	10.67
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.05

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.30154	Speed Power Coefficient (p)	0.55285
PF Slope Coefficient (m)	-1.22670	PF Power Coefficient (p)	0.81132
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	743	-	-	70.0

Vehicle Results

Average Speed, mi/h	70.0	Percent Followers, %	15.1
Segment Travel Time, minutes	0.12	Follower Density (FD), followers/mi/ln	0.2
Vehicle LOS	A		

Bicycle Results					
Percent Occupied Parking	0	Pavement Condition Rating	4		
Flow Rate Outside Lane, veh/h	83	Bicycle Effective Width, ft	35		
Bicycle LOS Score	1.82	Bicycle Effective Speed Factor	5.07		
Bicycle LOS	B				
Segment 8					
Vehicle Inputs					
Segment Type	Passing Zone	Length, ft	2717		
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0		
Demand and Capacity					
Directional Demand Flow Rate, veh/h	89	Opposing Demand Flow Rate, veh/h	0		
Peak Hour Factor	0.90	Total Trucks, %	12.50		
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.05		
Intermediate Results					
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0		
Speed Slope Coefficient (m)	4.19461	Speed Power Coefficient (p)	0.67576		
PF Slope Coefficient (m)	-1.07493	PF Power Coefficient (p)	0.86823		
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.2		
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0		
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2717	-	-	70.0
Vehicle Results					
Average Speed, mi/h	70.0	Percent Followers, %	12.3		
Segment Travel Time, minutes	0.44	Follower Density (FD), followers/mi/ln	0.2		
Vehicle LOS	A				
Bicycle Results					
Percent Occupied Parking	0	Pavement Condition Rating	4		
Flow Rate Outside Lane, veh/h	89	Bicycle Effective Width, ft	35		
Bicycle LOS Score	2.70	Bicycle Effective Speed Factor	5.07		
Bicycle LOS	C				
Segment 9					
Vehicle Inputs					
Segment Type	Passing Constrained	Length, ft	1013		
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0		
Demand and Capacity					

Directional Demand Flow Rate, veh/h		89	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		12.50
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.05
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29236	PF Power Coefficient (p)		0.75927
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1013	-	-	70.0
Vehicle Results					
Average Speed, mi/h		70.0	Percent Followers, %		18.6
Segment Travel Time, minutes		0.16	Follower Density (FD), followers/mi/ln		0.2
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		89	Bicycle Effective Width, ft		35
Bicycle LOS Score		2.70	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		4569
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		89	Opposing Demand Flow Rate, veh/h		156
Peak Hour Factor		0.90	Total Trucks, %		12.50
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.05
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.34581	Speed Power Coefficient (p)		0.55285
PF Slope Coefficient (m)		-1.14656	PF Power Coefficient (p)		0.84333
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	4569	-	-	70.0
Vehicle Results					
Average Speed, mi/h		70.0	Percent Followers, %		13.8
Segment Travel Time, minutes		0.74	Follower Density (FD), followers/mi/ln		0.2
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		89	Bicycle Effective Width, ft		35
Bicycle LOS Score		2.70	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		5676
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		111	Opposing Demand Flow Rate, veh/h		167
Peak Hour Factor		0.90	Total Trucks, %		11.34
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.07
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.36131	Speed Power Coefficient (p)		0.54922
PF Slope Coefficient (m)		-1.14178	PF Power Coefficient (p)		0.84180
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5676	-	-	69.6
Vehicle Results					
Average Speed, mi/h		69.6	Percent Followers, %		16.4
Segment Travel Time, minutes		0.93	Follower Density (FD), followers/mi/ln		0.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		111	Bicycle Effective Width, ft		33
Bicycle LOS Score		2.95	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 12					

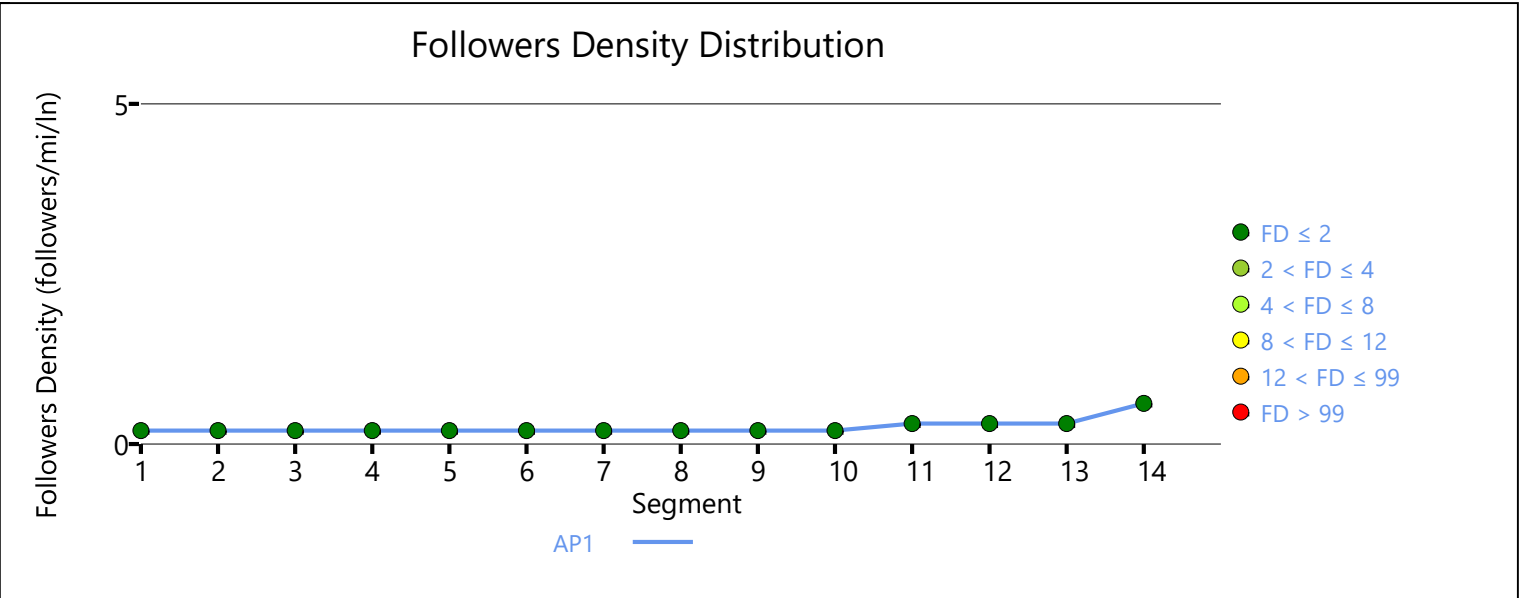
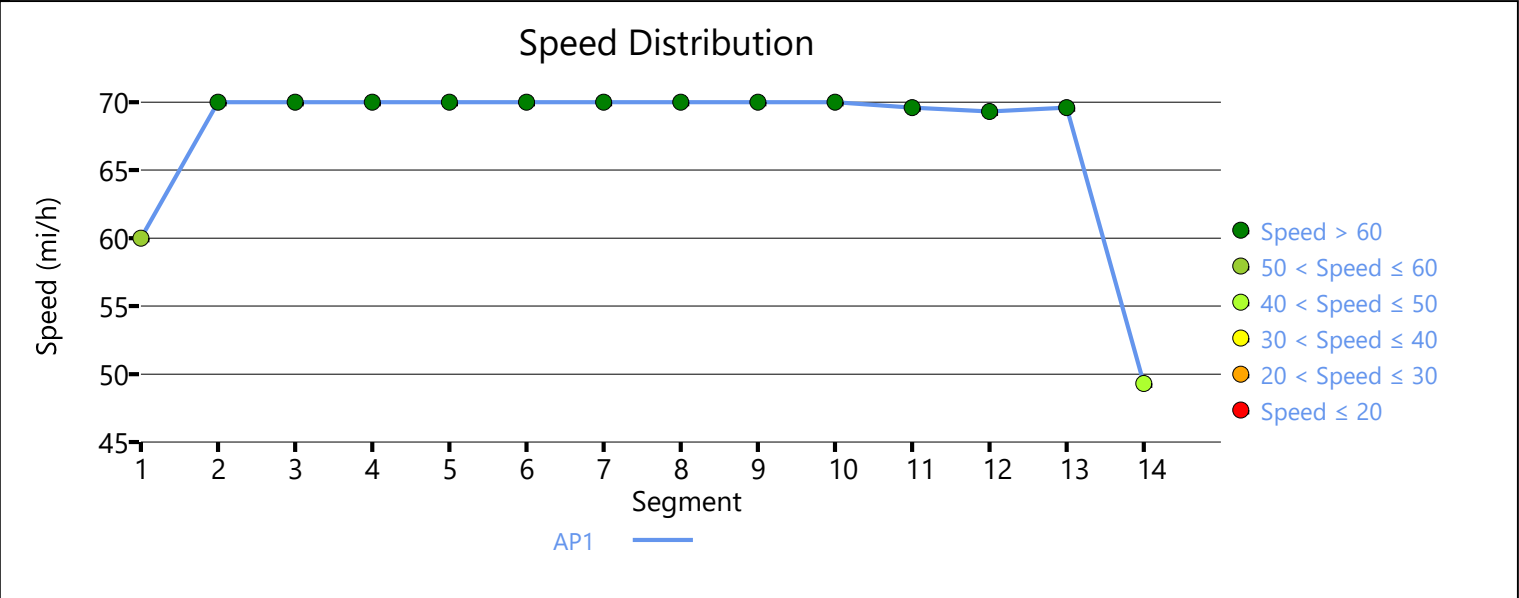
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		657
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		111	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		11.34
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.07
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29250	PF Power Coefficient (p)		0.75910
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	657	-	-	69.3
Vehicle Results					
Average Speed, mi/h		69.3	Percent Followers, %		21.6
Segment Travel Time, minutes		0.11	Follower Density (FD), followers/mi/ln		0.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		111	Bicycle Effective Width, ft		33
Bicycle LOS Score		2.95	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		6009
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		111	Opposing Demand Flow Rate, veh/h		167
Peak Hour Factor		0.90	Total Trucks, %		11.34
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.07
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.36440	Speed Power Coefficient (p)		0.54922
PF Slope Coefficient (m)		-1.14046	PF Power Coefficient (p)		0.84112

In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	6009	-	-	69.6
Vehicle Results					
Average Speed, mi/h		69.6	Percent Followers, %		16.4
Segment Travel Time, minutes		0.98	Follower Density (FD), followers/mi/ln		0.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		111	Bicycle Effective Width, ft		33
Bicycle LOS Score		2.95	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 14					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		891
Measured FFS		Measured	Free-Flow Speed, mi/h		50.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		111	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		11.34
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.07
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		50.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.47260	PF Power Coefficient (p)		0.71282
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	891	-	-	49.3
Vehicle Results					
Average Speed, mi/h		49.3	Percent Followers, %		26.5
Segment Travel Time, minutes		0.21	Follower Density (FD), followers/mi/ln		0.6
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4

Flow Rate Outside Lane, veh/h	111	Bicycle Effective Width, ft	33
Bicycle LOS Score	2.33	Bicycle Effective Speed Factor	4.42
Bicycle LOS	B		

Facility Results				
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	132	0.01	0.2	A



HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	12/28/2022
Agency	HRG	Analysis Year	2022
Jurisdiction	SDDOT	Time Analyzed	AM Peak
Project Description	SD 38 WB East of Hartford	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1727
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	156	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	8.97
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.09

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.58112	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.27241	PF Power Coefficient (p)	0.76681
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.6
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1727	-	-	68.6

Vehicle Results

Average Speed, mi/h	68.6	Percent Followers, %	26.3
Segment Travel Time, minutes	0.29	Follower Density (FD), followers/mi/ln	0.6
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	156	Bicycle Effective Width, ft	29
Bicycle LOS Score	3.34	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 2

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1676
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		156	Opposing Demand Flow Rate, veh/h		444
Peak Hour Factor		0.90	Total Trucks, %		8.97
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.39731	Speed Power Coefficient (p)		0.48990
PF Slope Coefficient (m)		-1.25657	PF Power Coefficient (p)		0.80067
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1676	-	-	68.9
Vehicle Results					
Average Speed, mi/h		68.9	Percent Followers, %		24.7
Segment Travel Time, minutes		0.28	Follower Density (FD), followers/mi/ln		0.6
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		156	Bicycle Effective Width, ft		29
Bicycle LOS Score		3.34	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 3					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1864
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		156	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		17.04
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.58341	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.26572	PF Power Coefficient (p)		0.77025
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1864	-	-	68.6

Vehicle Results

Average Speed, mi/h	68.6	Percent Followers, %	26.1
Segment Travel Time, minutes	0.31	Follower Density (FD), followers/mi/ln	0.6
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	156	Bicycle Effective Width, ft	29
Bicycle LOS Score	7.33	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 4

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	718
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	161	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	17.04
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.09

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29182	PF Power Coefficient (p)	0.75993
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.6
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	718	-	-	68.6

Vehicle Results

Average Speed, mi/h	68.6	Percent Followers, %	27.6
Segment Travel Time, minutes	0.12	Follower Density (FD), followers/mi/ln	0.6
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	161	Bicycle Effective Width, ft	29
Bicycle LOS Score	7.34	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1738
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		161	Opposing Demand Flow Rate, veh/h		239
Peak Hour Factor		0.90	Total Trucks, %		17.04
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.34005	Speed Power Coefficient (p)		0.52901
PF Slope Coefficient (m)		-1.22506	PF Power Coefficient (p)		0.81466
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1738	-	-	69.0
Vehicle Results					
Average Speed, mi/h		69.0	Percent Followers, %		24.2
Segment Travel Time, minutes		0.29	Follower Density (FD), followers/mi/ln		0.6
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		161	Bicycle Effective Width, ft		29
Bicycle LOS Score		7.34	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		579
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		161	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		17.04
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29182	PF Power Coefficient (p)	0.75993
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.6
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	579	-	-	68.6

Vehicle Results

Average Speed, mi/h	68.6	Percent Followers, %	27.6
Segment Travel Time, minutes	0.10	Follower Density (FD), followers/mi/ln	0.6
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	161	Bicycle Effective Width, ft	29
Bicycle LOS Score	7.34	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 7

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	2262
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	150	Opposing Demand Flow Rate, veh/h	239
Peak Hour Factor	0.90	Total Trucks, %	18.44
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.09

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.34837	Speed Power Coefficient (p)	0.52901
PF Slope Coefficient (m)	-1.20599	PF Power Coefficient (p)	0.82289
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.5
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2262	-	-	69.1

Vehicle Results

Average Speed, mi/h	69.1	Percent Followers, %	22.4
Segment Travel Time, minutes	0.37	Follower Density (FD), followers/mi/ln	0.5
Vehicle LOS	A		

Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		150	Bicycle Effective Width, ft		30
Bicycle LOS Score		7.85	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 8					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		980
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		150	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29166	PF Power Coefficient (p)		0.76014
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	980	-	-	68.7
Vehicle Results					
Average Speed, mi/h		68.7	Percent Followers, %		26.3
Segment Travel Time, minutes		0.16	Follower Density (FD), followers/mi/ln		0.6
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		150	Bicycle Effective Width, ft		30
Bicycle LOS Score		7.85	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 9					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		3667
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					

Directional Demand Flow Rate, veh/h		150	Opposing Demand Flow Rate, veh/h		211
Peak Hour Factor		0.90	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.35717	Speed Power Coefficient (p)		0.53618
PF Slope Coefficient (m)		-1.16948	PF Power Coefficient (p)		0.83666
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3667	-	-	69.1
Vehicle Results					
Average Speed, mi/h		69.1	Percent Followers, %		21.3
Segment Travel Time, minutes		0.60	Follower Density (FD), followers/mi/ln		0.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		150	Bicycle Effective Width, ft		30
Bicycle LOS Score		7.85	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1846
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		150	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.58311	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.26629	PF Power Coefficient (p)		0.77017
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	1846	-	-	68.7
Vehicle Results					
Average Speed, mi/h		68.7	Percent Followers, %		25.5
Segment Travel Time, minutes		0.31	Follower Density (FD), followers/mi/ln		0.6
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		150	Bicycle Effective Width, ft		30
Bicycle LOS Score		7.85	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		2174
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		150	Opposing Demand Flow Rate, veh/h		211
Peak Hour Factor		0.90	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.33744	Speed Power Coefficient (p)		0.53618
PF Slope Coefficient (m)		-1.20334	PF Power Coefficient (p)		0.82378
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2174	-	-	69.1
Vehicle Results					
Average Speed, mi/h		69.1	Percent Followers, %		22.3
Segment Travel Time, minutes		0.36	Follower Density (FD), followers/mi/ln		0.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		150	Bicycle Effective Width, ft		30
Bicycle LOS Score		7.85	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 12					

Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1277
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		150	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29166	PF Power Coefficient (p)		0.76014
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1277	-	-	68.7
Vehicle Results					
Average Speed, mi/h		68.7	Percent Followers, %		26.3
Segment Travel Time, minutes		0.21	Follower Density (FD), followers/mi/ln		0.6
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		150	Bicycle Effective Width, ft		30
Bicycle LOS Score		7.85	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		779
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		150	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29166	PF Power Coefficient (p)		0.76014

In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	779	-	-	68.7
Vehicle Results					
Average Speed, mi/h		68.7	Percent Followers, %		26.3
Segment Travel Time, minutes		0.13	Follower Density (FD), followers/mi/ln		0.6
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		150	Bicycle Effective Width, ft		30
Bicycle LOS Score		7.85	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 14					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		422
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		156	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		13.95
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29219	PF Power Coefficient (p)		0.75948
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	422	-	-	68.6
Vehicle Results					
Average Speed, mi/h		68.6	Percent Followers, %		27.0
Segment Travel Time, minutes		0.07	Follower Density (FD), followers/mi/ln		0.6
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4

Flow Rate Outside Lane, veh/h	156	Bicycle Effective Width, ft	29
Bicycle LOS Score	5.63	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 15

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1478
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	144	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	19.53
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.08

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57671	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.28298	PF Power Coefficient (p)	0.76370
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.5
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1478	-	-	68.7

Vehicle Results

Average Speed, mi/h	68.7	Percent Followers, %	25.4
Segment Travel Time, minutes	0.24	Follower Density (FD), followers/mi/ln	0.5
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	144	Bicycle Effective Width, ft	30
Bicycle LOS Score	8.51	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 16

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	384
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	222	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	12.76
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.13

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29233	PF Power Coefficient (p)	0.75931
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.1
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	384	-	-	68.1

Vehicle Results			
Average Speed, mi/h	68.1	Percent Followers, %	33.8
Segment Travel Time, minutes	0.06	Follower Density (FD), followers/mi/ln	1.1
Vehicle LOS	A		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	222	Bicycle Effective Width, ft	24
Bicycle LOS Score	6.54	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 17

Vehicle Inputs			
Segment Type	Passing Constrained	Length, ft	3732
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	217	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	12.21
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.13

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.60878	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.21846	PF Power Coefficient (p)	0.78615
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3732	-	-	68.1

Vehicle Results			
Average Speed, mi/h	68.1	Percent Followers, %	30.7

Segment Travel Time, minutes		0.62	Follower Density (FD), followers/mi/ln		1.0
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		217	Bicycle Effective Width, ft		24
Bicycle LOS Score		6.26	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 18					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1360
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		217	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		12.21
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.13
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57450	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29014	PF Power Coefficient (p)		0.76012
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1360	-	-	68.1
Vehicle Results					
Average Speed, mi/h		68.1	Percent Followers, %		33.2
Segment Travel Time, minutes		0.23	Follower Density (FD), followers/mi/ln		1.1
Vehicle LOS		A			

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	217	Bicycle Effective Width, ft	24
Bicycle LOS Score	6.26	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		
Segment 19			
Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	1595
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		217	Opposing Demand Flow Rate, veh/h		411
Peak Hour Factor		0.90	Total Trucks, %		12.21
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.13
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.38753	Speed Power Coefficient (p)		0.49503
PF Slope Coefficient (m)		-1.25652	PF Power Coefficient (p)		0.80127
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.0
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1595	-	-	68.5
Vehicle Results					
Average Speed, mi/h		68.5	Percent Followers, %		30.9
Segment Travel Time, minutes		0.26	Follower Density (FD), followers/mi/ln		1.0
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		217	Bicycle Effective Width, ft		24
Bicycle LOS Score		6.26	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 20					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		595
Measured FFS		Measured	Free-Flow Speed, mi/h		55.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		217	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		12.21
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.13
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		55.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.43841	PF Power Coefficient (p)		0.72616
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	595	-	-	53.1

Vehicle Results

Average Speed, mi/h	53.1	Percent Followers, %	37.7
Segment Travel Time, minutes	0.13	Follower Density (FD), followers/mi/ln	1.5
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	217	Bicycle Effective Width, ft	24
Bicycle LOS Score	5.80	Bicycle Effective Speed Factor	4.62
Bicycle LOS	F		

Segment 21

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	958
Measured FFS	Measured	Free-Flow Speed, mi/h	55.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	217	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	10.81
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.13

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.43859	PF Power Coefficient (p)	0.72596
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.5
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	958	-	-	53.1

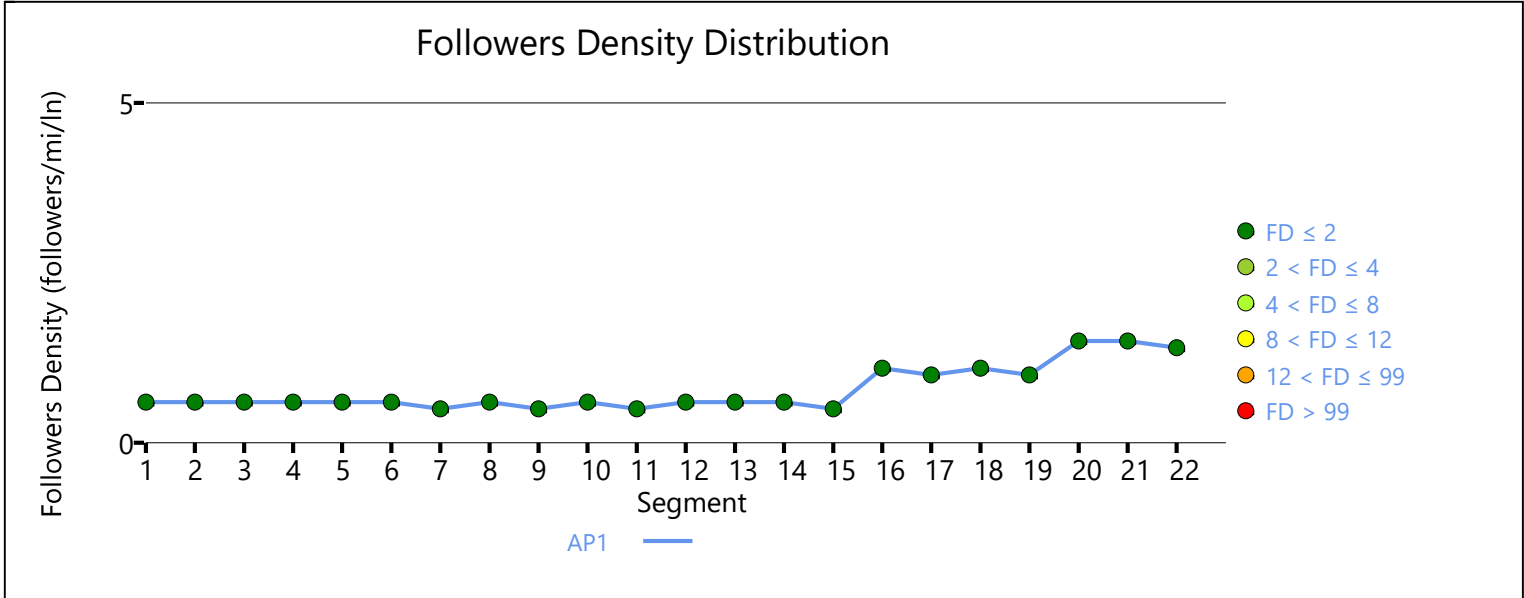
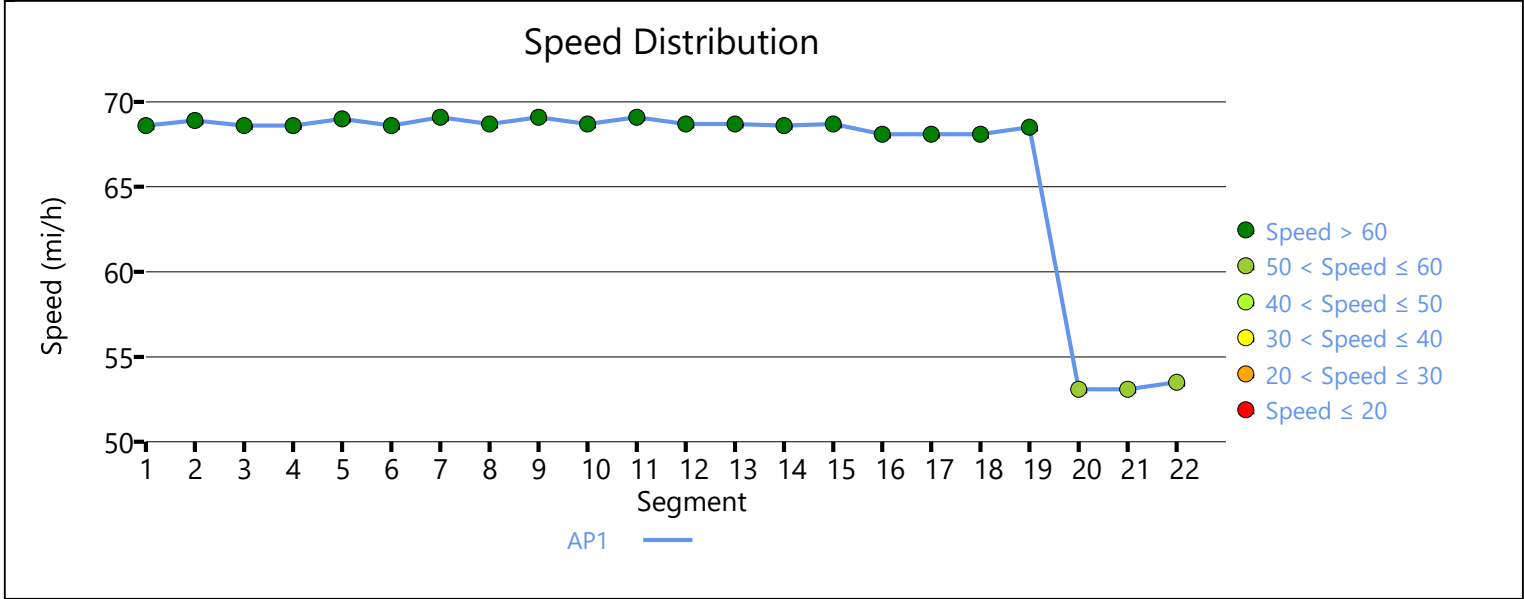
Vehicle Results

Average Speed, mi/h	53.1	Percent Followers, %	37.7
Segment Travel Time, minutes	0.20	Follower Density (FD), followers/mi/ln	1.5
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	217	Bicycle Effective Width, ft	24
Bicycle LOS Score	5.21	Bicycle Effective Speed Factor	4.62
Bicycle LOS	E		

Segment 22					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1659
Measured FFS		Measured	Free-Flow Speed, mi/h		55.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		217	Opposing Demand Flow Rate, veh/h		361
Peak Hour Factor		0.90	Total Trucks, %		10.81
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.13
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		55.0
Speed Slope Coefficient (m)		4.37546	Speed Power Coefficient (p)		0.50346
PF Slope Coefficient (m)		-1.34127	PF Power Coefficient (p)		0.76726
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1659	-	-	53.5
Vehicle Results					
Average Speed, mi/h		53.5	Percent Followers, %		34.0
Segment Travel Time, minutes		0.35	Follower Density (FD), followers/mi/ln		1.4
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		217	Bicycle Effective Width, ft		24
Bicycle LOS Score		5.21	Bicycle Effective Speed Factor		4.62
Bicycle LOS		E			
Facility Results					
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln		LOS
1	246	0.08	0.7		A



HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	12/28/2022
Agency	HRG	Analysis Year	2022
Jurisdiction	SDDOT	Time Analyzed	PM Peak
Project Description	SD 38 WB East of Hartford	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1727
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	461	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	2.48
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.27

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.58112	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.27317	PF Power Coefficient (p)	0.76586
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.5
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1727	-	-	67.0

Vehicle Results

Average Speed, mi/h	67.0	Percent Followers, %	50.5
Segment Travel Time, minutes	0.29	Follower Density (FD), followers/mi/ln	3.5
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	461	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.03	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 2

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1676
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity							
Directional Demand Flow Rate, veh/h		461		Opposing Demand Flow Rate, veh/h		217	
Peak Hour Factor		0.90		Total Trucks, %		2.48	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.27	
Intermediate Results							
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0	
Speed Slope Coefficient (m)		4.33136		Speed Power Coefficient (p)		0.53470	
PF Slope Coefficient (m)		-1.22492		PF Power Coefficient (p)		0.81291	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		3.3	
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0	
Subsegment Data							
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h		
1	Tangent	1676	-	-	67.5		
Vehicle Results							
Average Speed, mi/h		67.5		Percent Followers, %		47.9	
Segment Travel Time, minutes		0.28		Follower Density (FD), followers/mi/ln		3.3	
Vehicle LOS		B					
Bicycle Results							
Percent Occupied Parking		0		Pavement Condition Rating		4	
Flow Rate Outside Lane, veh/h		461		Bicycle Effective Width, ft		24	
Bicycle LOS Score		3.03		Bicycle Effective Speed Factor		5.07	
Bicycle LOS		C					
Segment 3							
Vehicle Inputs							
Segment Type		Passing Constrained		Length, ft		1864	
Measured FFS		Measured		Free-Flow Speed, mi/h		70.0	
Demand and Capacity							
Directional Demand Flow Rate, veh/h		461		Opposing Demand Flow Rate, veh/h		-	
Peak Hour Factor		0.90		Total Trucks, %		5.36	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.27	
Intermediate Results							
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0	
Speed Slope Coefficient (m)		4.58341		Speed Power Coefficient (p)		0.41674	
PF Slope Coefficient (m)		-1.26707		PF Power Coefficient (p)		0.76853	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		3.5	
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0	
Subsegment Data							

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1864	-	-	67.0

Vehicle Results

Average Speed, mi/h	67.0	Percent Followers, %	50.3
Segment Travel Time, minutes	0.32	Follower Density (FD), followers/mi/ln	3.5
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	461	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.89	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 4

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	718
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	283	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	5.36
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.17

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29320	PF Power Coefficient (p)	0.75822
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.6
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	718	-	-	67.7

Vehicle Results

Average Speed, mi/h	67.7	Percent Followers, %	39.2
Segment Travel Time, minutes	0.12	Follower Density (FD), followers/mi/ln	1.6
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	283	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.64	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Zone		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
1738		70.0			
Demand and Capacity					
Directional Demand Flow Rate, veh/h		283		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.90		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.17	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
Speed Slope Coefficient (m)		4.33242		Speed Power Coefficient (p)	
PF Slope Coefficient (m)		-1.22197		PF Power Coefficient (p)	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln	
%Improvement to Percent Followers		0.0		%Improvement to Speed	
				0.0	
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1738	-	-	68.3
Vehicle Results					
Average Speed, mi/h		68.3		Percent Followers, %	
Segment Travel Time, minutes		0.29		Follower Density (FD), followers/mi/ln	
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0		Pavement Condition Rating	
Flow Rate Outside Lane, veh/h		283		Bicycle Effective Width, ft	
Bicycle LOS Score		3.64		Bicycle Effective Speed Factor	
Bicycle LOS		D			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		283		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.90		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.17	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
				70.0	

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29320	PF Power Coefficient (p)	0.75822
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.6
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	579	-	-	67.7

Vehicle Results			
Average Speed, mi/h	67.7	Percent Followers, %	39.2
Segment Travel Time, minutes	0.10	Follower Density (FD), followers/mi/ln	1.6
Vehicle LOS	A		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	283	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.64	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 7

Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	2262
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	250	Opposing Demand Flow Rate, veh/h	217
Peak Hour Factor	0.90	Total Trucks, %	7.27
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.15

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.34073	Speed Power Coefficient (p)	0.53470
PF Slope Coefficient (m)	-1.20291	PF Power Coefficient (p)	0.82283
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2262	-	-	68.4

Vehicle Results			
Average Speed, mi/h	68.4	Percent Followers, %	31.9
Segment Travel Time, minutes	0.38	Follower Density (FD), followers/mi/ln	1.2
Vehicle LOS	A		

Bicycle Results					
Percent Occupied Parking	0	Pavement Condition Rating	4		
Flow Rate Outside Lane, veh/h	250	Bicycle Effective Width, ft	24		
Bicycle LOS Score	4.24	Bicycle Effective Speed Factor	5.07		
Bicycle LOS	D				
Segment 8					
Vehicle Inputs					
Segment Type	Passing Constrained	Length, ft	980		
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0		
Demand and Capacity					
Directional Demand Flow Rate, veh/h	250	Opposing Demand Flow Rate, veh/h	-		
Peak Hour Factor	0.90	Total Trucks, %	7.27		
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.15		
Intermediate Results					
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0		
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674		
PF Slope Coefficient (m)	-1.29298	PF Power Coefficient (p)	0.75850		
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.3		
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0		
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	980	-	-	67.9
Vehicle Results					
Average Speed, mi/h	67.9	Percent Followers, %	36.4		
Segment Travel Time, minutes	0.16	Follower Density (FD), followers/mi/ln	1.3		
Vehicle LOS	A				
Bicycle Results					
Percent Occupied Parking	0	Pavement Condition Rating	4		
Flow Rate Outside Lane, veh/h	250	Bicycle Effective Width, ft	24		
Bicycle LOS Score	4.24	Bicycle Effective Speed Factor	5.07		
Bicycle LOS	D				
Segment 9					
Vehicle Inputs					
Segment Type	Passing Zone	Length, ft	3667		
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0		
Demand and Capacity					

Directional Demand Flow Rate, veh/h		250	Opposing Demand Flow Rate, veh/h		183
Peak Hour Factor		0.90	Total Trucks, %		7.27
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.34691	Speed Power Coefficient (p)		0.54407
PF Slope Coefficient (m)		-1.16475	PF Power Coefficient (p)		0.83728
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3667	-	-	68.5
Vehicle Results					
Average Speed, mi/h		68.5	Percent Followers, %		30.6
Segment Travel Time, minutes		0.61	Follower Density (FD), followers/mi/ln		1.1
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		250	Bicycle Effective Width, ft		24
Bicycle LOS Score		4.24	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1846
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		250	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		7.27
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.58311	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.26758	PF Power Coefficient (p)		0.76853
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	1846	-	-	67.9
Vehicle Results					
Average Speed, mi/h		67.9	Percent Followers, %		35.4
Segment Travel Time, minutes		0.31	Follower Density (FD), followers/mi/ln		1.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		250	Bicycle Effective Width, ft		24
Bicycle LOS Score		4.24	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		2174
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		250	Opposing Demand Flow Rate, veh/h		183
Peak Hour Factor		0.90	Total Trucks, %		7.27
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.32718	Speed Power Coefficient (p)		0.54407
PF Slope Coefficient (m)		-1.19845	PF Power Coefficient (p)		0.82430
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2174	-	-	68.5
Vehicle Results					
Average Speed, mi/h		68.5	Percent Followers, %		31.8
Segment Travel Time, minutes		0.36	Follower Density (FD), followers/mi/ln		1.2
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		250	Bicycle Effective Width, ft		24
Bicycle LOS Score		4.24	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 12					

Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1277
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		250	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		7.27
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29298	PF Power Coefficient (p)		0.75850
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1277	-	-	67.9
Vehicle Results					
Average Speed, mi/h		67.9	Percent Followers, %		36.4
Segment Travel Time, minutes		0.21	Follower Density (FD), followers/mi/ln		1.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		250	Bicycle Effective Width, ft		24
Bicycle LOS Score		4.24	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		779
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		250	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		7.27
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29298	PF Power Coefficient (p)		0.75850

In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	779	-	-	67.9
Vehicle Results					
Average Speed, mi/h		67.9	Percent Followers, %		36.4
Segment Travel Time, minutes		0.13	Follower Density (FD), followers/mi/ln		1.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		250	Bicycle Effective Width, ft		24
Bicycle LOS Score		4.24	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 14					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		422
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		267	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		4.04
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.16
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29336	PF Power Coefficient (p)		0.75803
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	422	-	-	67.8
Vehicle Results					
Average Speed, mi/h		67.8	Percent Followers, %		37.8
Segment Travel Time, minutes		0.07	Follower Density (FD), followers/mi/ln		1.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4

Flow Rate Outside Lane, veh/h	267	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.19	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 15

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1478
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	250	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	1.57
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.15

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57671	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.28508	PF Power Coefficient (p)	0.76107
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1478	-	-	67.9

Vehicle Results

Average Speed, mi/h	67.9	Percent Followers, %	36.1
Segment Travel Time, minutes	0.25	Follower Density (FD), followers/mi/ln	1.3
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	250	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.49	Bicycle Effective Speed Factor	5.07
Bicycle LOS	B		

Segment 16

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	384
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	500	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	1.57
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.29

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29365	PF Power Coefficient (p)	0.75767
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	384	-	-	66.9

Vehicle Results			
Average Speed, mi/h	66.9	Percent Followers, %	53.5
Segment Travel Time, minutes	0.07	Follower Density (FD), followers/mi/ln	4.0
Vehicle LOS	B		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	500	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.84	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 17

Vehicle Inputs			
Segment Type	Passing Constrained	Length, ft	3732
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	500	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	2.20
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.29

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.60878	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.21958	PF Power Coefficient (p)	0.78464
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.8
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3732	-	-	66.9

Vehicle Results			
Average Speed, mi/h	66.9	Percent Followers, %	50.7

Segment Travel Time, minutes		0.63	Follower Density (FD), followers/mi/ln		3.8
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		500	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.00	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 18					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1360
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		500	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		2.20
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.29
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57450	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29132	PF Power Coefficient (p)		0.75866
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		4.0
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1360	-	-	66.9
Vehicle Results					
Average Speed, mi/h		66.9	Percent Followers, %		53.4
Segment Travel Time, minutes		0.23	Follower Density (FD), followers/mi/ln		4.0
Vehicle LOS		B			

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	500	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.00	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		
Segment 19			
Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	1595
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		500	Opposing Demand Flow Rate, veh/h		222
Peak Hour Factor		0.90	Total Trucks, %		2.20
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.29
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.33188	Speed Power Coefficient (p)		0.53324
PF Slope Coefficient (m)		-1.22969	PF Power Coefficient (p)		0.81090
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		3.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1595	-	-	67.3
Vehicle Results					
Average Speed, mi/h		67.3	Percent Followers, %		50.4
Segment Travel Time, minutes		0.27	Follower Density (FD), followers/mi/ln		3.7
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		500	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.00	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 20					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		595
Measured FFS		Measured	Free-Flow Speed, mi/h		55.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		500	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		2.20
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.29
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		55.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.43972	PF Power Coefficient (p)		0.72475
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		5.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	595	-	-	51.9

Vehicle Results

Average Speed, mi/h	51.9	Percent Followers, %	58.2
Segment Travel Time, minutes	0.13	Follower Density (FD), followers/mi/ln	5.6
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	500	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.87	Bicycle Effective Speed Factor	4.62
Bicycle LOS	C		

Segment 21

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	958
Measured FFS	Measured	Free-Flow Speed, mi/h	55.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	417	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	2.21
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.25

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.43972	PF Power Coefficient (p)	0.72475
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	958	-	-	52.2

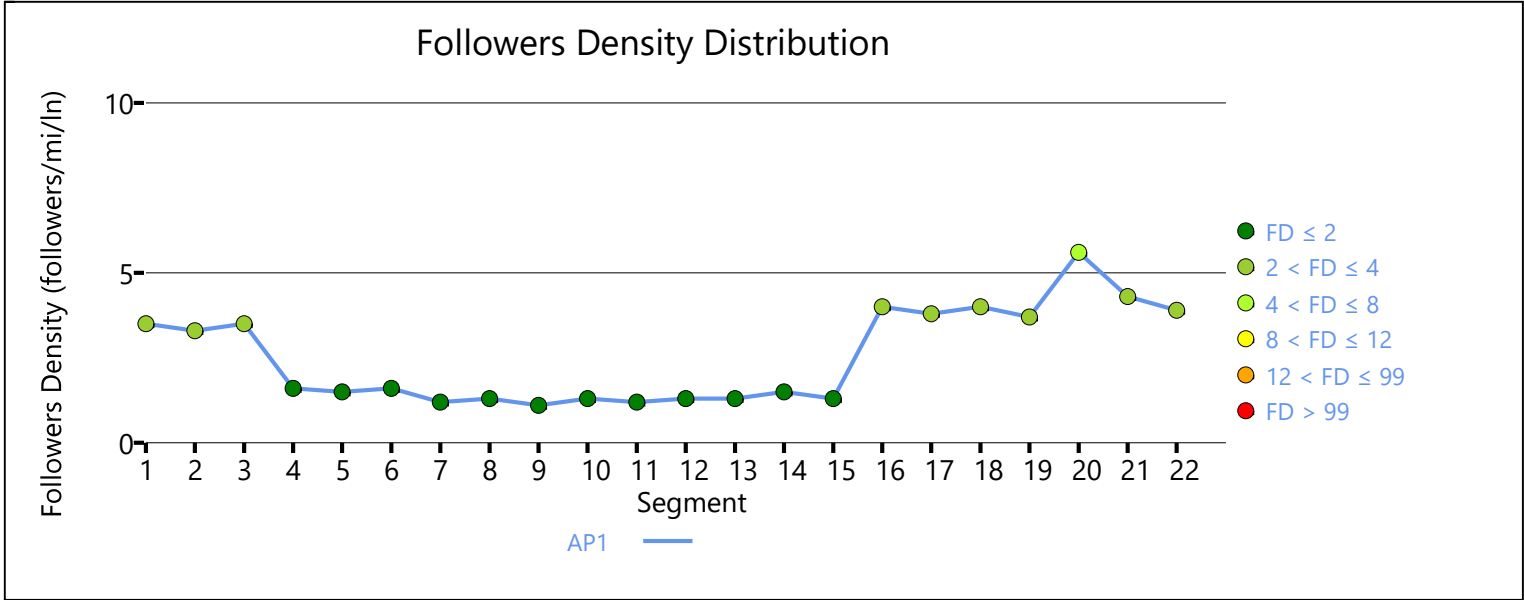
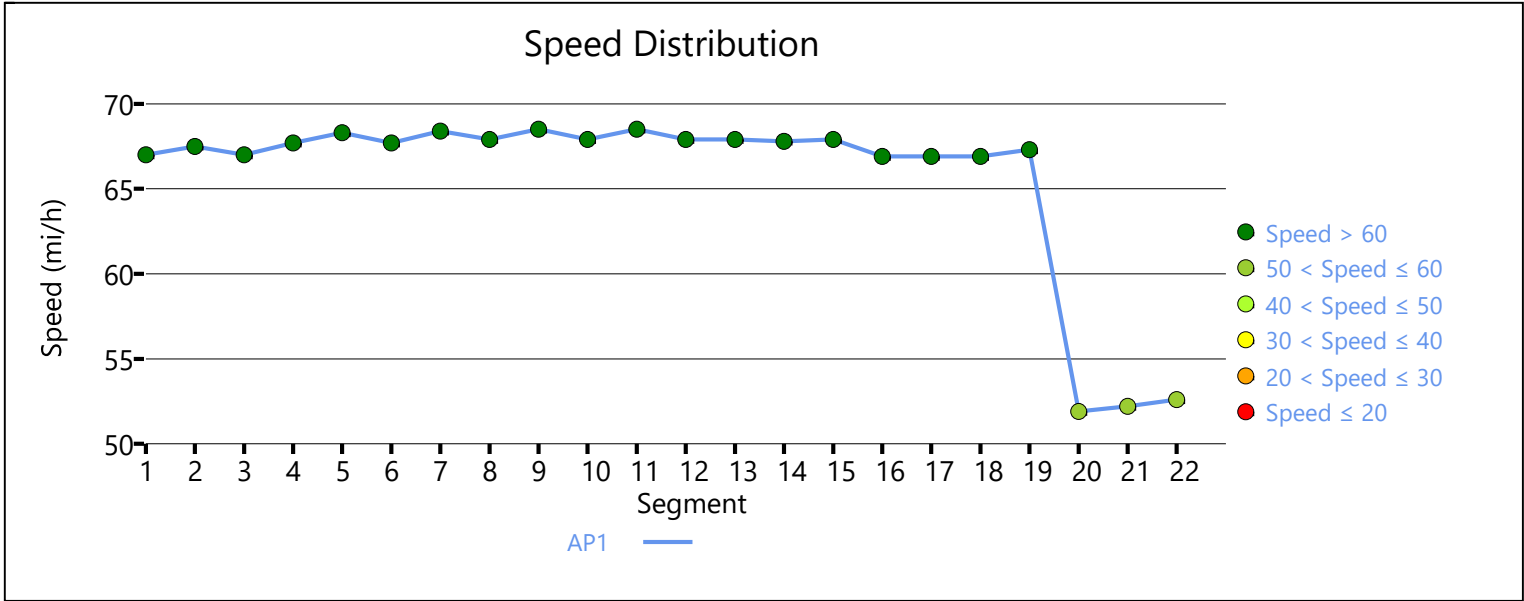
Vehicle Results

Average Speed, mi/h	52.2	Percent Followers, %	53.4
Segment Travel Time, minutes	0.21	Follower Density (FD), followers/mi/ln	4.3
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	417	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.78	Bicycle Effective Speed Factor	4.62
Bicycle LOS	C		

Segment 22					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft	1659	
Measured FFS		Measured	Free-Flow Speed, mi/h	55.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		417	Opposing Demand Flow Rate, veh/h	228	
Peak Hour Factor		0.90	Total Trucks, %	2.21	
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)	0.25	
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h	55.0	
Speed Slope Coefficient (m)		4.33493	Speed Power Coefficient (p)	0.53180	
PF Slope Coefficient (m)		-1.31418	PF Power Coefficient (p)	0.77310	
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln	3.9	
%Improvement to Percent Followers		0.0	%Improvement to Speed	0.0	
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1659	-	-	52.6
Vehicle Results					
Average Speed, mi/h		52.6	Percent Followers, %	48.7	
Segment Travel Time, minutes		0.36	Follower Density (FD), followers/mi/ln	3.9	
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating	4	
Flow Rate Outside Lane, veh/h		417	Bicycle Effective Width, ft	24	
Bicycle LOS Score		2.78	Bicycle Effective Speed Factor	4.62	
Bicycle LOS		C			
Facility Results					
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS	
1	509	0.29	2.4	B	



HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	12/28/2022
Agency	HRG	Analysis Year	2022
Jurisdiction	SDDOT	Time Analyzed	AM Peak
Project Description	WB 38 West of Hartford	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	10549
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	100	Opposing Demand Flow Rate, veh/h	156
Peak Hour Factor	0.90	Total Trucks, %	12.50
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.06

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.39553	Speed Power Coefficient (p)	0.55285
PF Slope Coefficient (m)	-1.14831	PF Power Coefficient (p)	0.81486
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	10549	-	-	70.0

Vehicle Results

Average Speed, mi/h	70.0	Percent Followers, %	16.1
Segment Travel Time, minutes	1.71	Follower Density (FD), followers/mi/ln	0.2
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	100	Bicycle Effective Width, ft	34
Bicycle LOS Score	3.11	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 2

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	2793
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity							
Directional Demand Flow Rate, veh/h		100		Opposing Demand Flow Rate, veh/h		156	
Peak Hour Factor		0.90		Total Trucks, %		12.50	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.06	
Intermediate Results							
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0	
Speed Slope Coefficient (m)		4.32493		Speed Power Coefficient (p)		0.55285	
PF Slope Coefficient (m)		-1.17404		PF Power Coefficient (p)		0.83464	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		0.2	
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0	
Subsegment Data							
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h		
1	Tangent	2793	-	-	70.0		
Vehicle Results							
Average Speed, mi/h		70.0		Percent Followers, %		15.8	
Segment Travel Time, minutes		0.45		Follower Density (FD), followers/mi/ln		0.2	
Vehicle LOS		A					
Bicycle Results							
Percent Occupied Parking		0		Pavement Condition Rating		4	
Flow Rate Outside Lane, veh/h		100		Bicycle Effective Width, ft		34	
Bicycle LOS Score		3.11		Bicycle Effective Speed Factor		5.07	
Bicycle LOS		C					
Segment 3							
Vehicle Inputs							
Segment Type		Passing Zone		Length, ft		3825	
Measured FFS		Measured		Free-Flow Speed, mi/h		70.0	
Demand and Capacity							
Directional Demand Flow Rate, veh/h		89		Opposing Demand Flow Rate, veh/h		133	
Peak Hour Factor		0.90		Total Trucks, %		2.40	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.05	
Intermediate Results							
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0	
Speed Slope Coefficient (m)		4.32808		Speed Power Coefficient (p)		0.56068	
PF Slope Coefficient (m)		-1.15024		PF Power Coefficient (p)		0.84206	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		0.2	
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0	
Subsegment Data							

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3825	-	-	70.0

Vehicle Results

Average Speed, mi/h	70.0	Percent Followers, %	13.9
Segment Travel Time, minutes	0.62	Follower Density (FD), followers/mi/ln	0.2
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	89	Bicycle Effective Width, ft	35
Bicycle LOS Score	0.00	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 4

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	791
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	89	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	2.40
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.05

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29355	PF Power Coefficient (p)	0.75779
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	791	-	-	70.0

Vehicle Results

Average Speed, mi/h	70.0	Percent Followers, %	18.7
Segment Travel Time, minutes	0.13	Follower Density (FD), followers/mi/ln	0.2
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	89	Bicycle Effective Width, ft	35
Bicycle LOS Score	0.00	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		3414
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		89	Opposing Demand Flow Rate, veh/h		133
Peak Hour Factor		0.90	Total Trucks, %		2.40
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.05
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.32324	Speed Power Coefficient (p)		0.56068
PF Slope Coefficient (m)		-1.15659	PF Power Coefficient (p)		0.84001
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3414	-	-	70.0
Vehicle Results					
Average Speed, mi/h		70.0	Percent Followers, %		14.1
Segment Travel Time, minutes		0.55	Follower Density (FD), followers/mi/ln		0.2
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		89	Bicycle Effective Width, ft		35
Bicycle LOS Score		0.00	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		286
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		89	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		2.40
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.05
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29355	PF Power Coefficient (p)	0.75779
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	286	-	-	70.0

Vehicle Results			
Average Speed, mi/h	70.0	Percent Followers, %	18.7
Segment Travel Time, minutes	0.05	Follower Density (FD), followers/mi/ln	0.2
Vehicle LOS	A		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	89	Bicycle Effective Width, ft	35
Bicycle LOS Score	0.00	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 7

Vehicle Inputs			
Segment Type	Passing Constrained	Length, ft	463
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	94	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	2.60
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.06

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29353	PF Power Coefficient (p)	0.75782
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	463	-	-	70.0

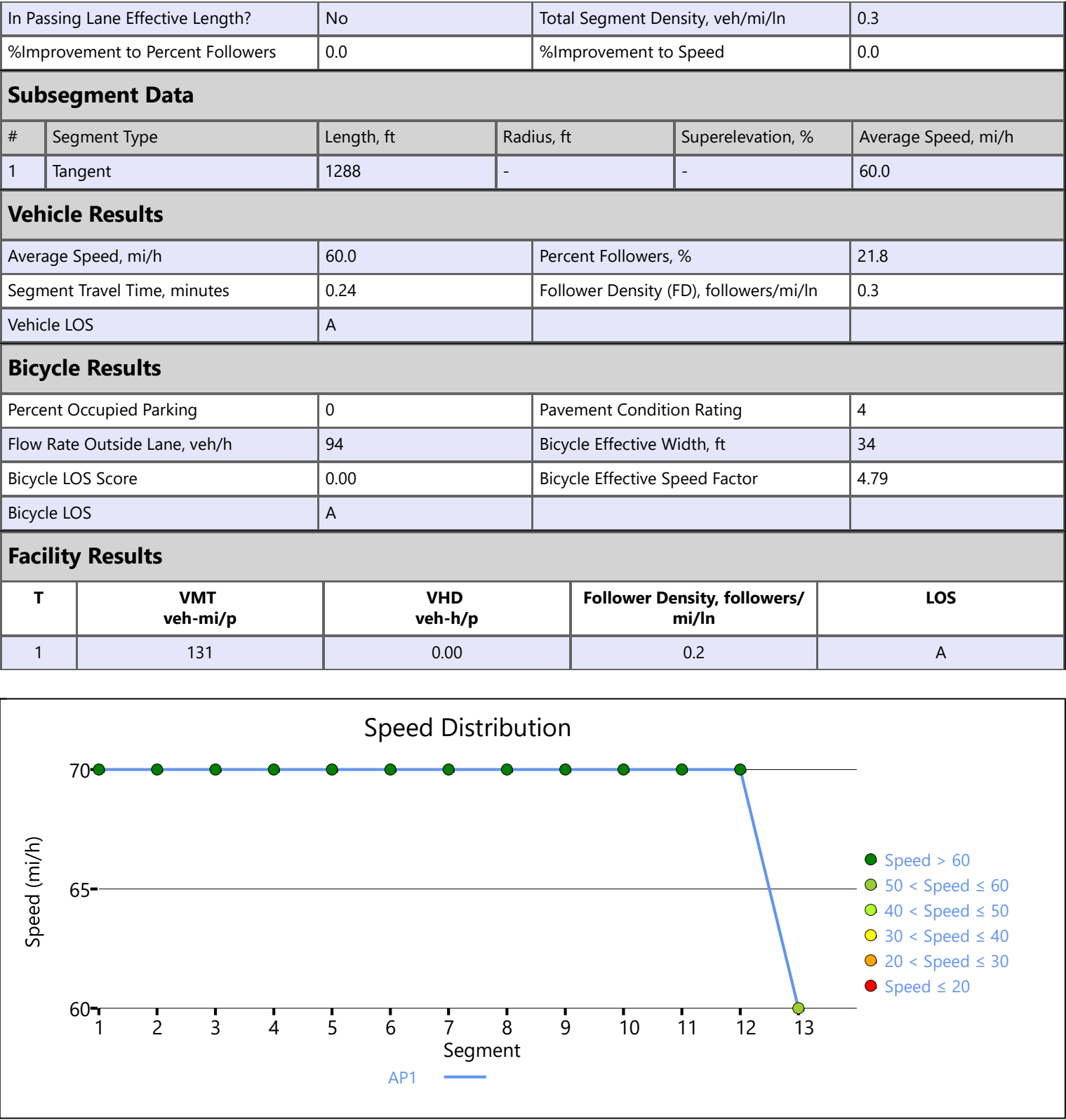
Vehicle Results			
Average Speed, mi/h	70.0	Percent Followers, %	19.5
Segment Travel Time, minutes	0.08	Follower Density (FD), followers/mi/ln	0.3
Vehicle LOS	A		

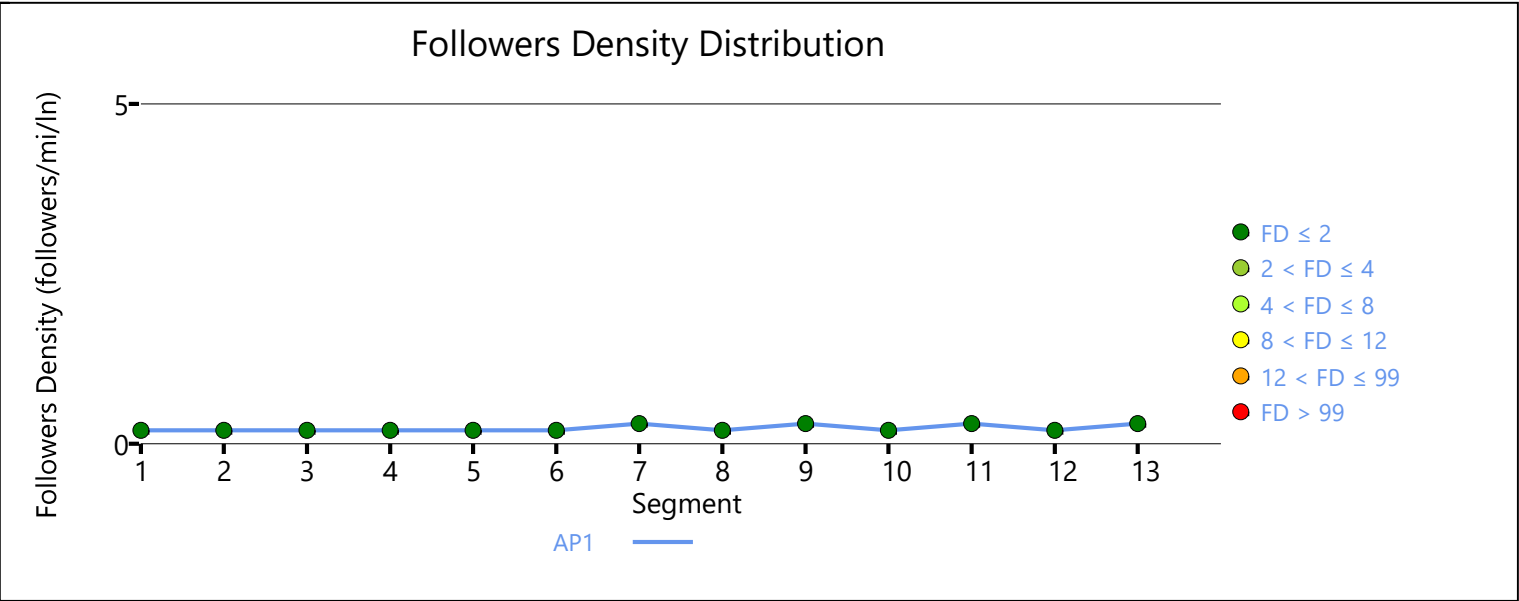
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		94	Bicycle Effective Width, ft		34
Bicycle LOS Score		0.00	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 8					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		4822
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		94	Opposing Demand Flow Rate, veh/h		133
Peak Hour Factor		0.90	Total Trucks, %		2.60
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.06
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.33883	Speed Power Coefficient (p)		0.56068
PF Slope Coefficient (m)		-1.13939	PF Power Coefficient (p)		0.84436
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	4822	-	-	70.0
Vehicle Results					
Average Speed, mi/h		70.0	Percent Followers, %		14.4
Segment Travel Time, minutes		0.78	Follower Density (FD), followers/mi/ln		0.2
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		94	Bicycle Effective Width, ft		34
Bicycle LOS Score		0.00	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 9					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		861
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					

Directional Demand Flow Rate, veh/h		94	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		2.60
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.06
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29353	PF Power Coefficient (p)		0.75782
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	861	-	-	70.0
Vehicle Results					
Average Speed, mi/h		70.0	Percent Followers, %		19.5
Segment Travel Time, minutes		0.14	Follower Density (FD), followers/mi/ln		0.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		94	Bicycle Effective Width, ft		34
Bicycle LOS Score		0.00	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1556
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		94	Opposing Demand Flow Rate, veh/h		133
Peak Hour Factor		0.90	Total Trucks, %		2.60
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.06
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.29636	Speed Power Coefficient (p)		0.56068
PF Slope Coefficient (m)		-1.20943	PF Power Coefficient (p)		0.81751
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	1556	-	-	70.0
Vehicle Results					
Average Speed, mi/h		70.0	Percent Followers, %		16.1
Segment Travel Time, minutes		0.25	Follower Density (FD), followers/mi/ln		0.2
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		94	Bicycle Effective Width, ft		34
Bicycle LOS Score		0.00	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		799
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		94	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		2.60
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.06
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29353	PF Power Coefficient (p)		0.75782
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	799	-	-	70.0
Vehicle Results					
Average Speed, mi/h		70.0	Percent Followers, %		19.5
Segment Travel Time, minutes		0.13	Follower Density (FD), followers/mi/ln		0.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		94	Bicycle Effective Width, ft		34
Bicycle LOS Score		0.00	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 12					

Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		857
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		94	Opposing Demand Flow Rate, veh/h		133
Peak Hour Factor		0.90	Total Trucks, %		2.60
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.06
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.29195	Speed Power Coefficient (p)		0.56068
PF Slope Coefficient (m)		-1.22114	PF Power Coefficient (p)		0.81213
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	857	-	-	70.0
Vehicle Results					
Average Speed, mi/h		70.0	Percent Followers, %		16.4
Segment Travel Time, minutes		0.14	Follower Density (FD), followers/mi/ln		0.2
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		94	Bicycle Effective Width, ft		34
Bicycle LOS Score		0.00	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1288
Measured FFS		Measured	Free-Flow Speed, mi/h		60.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		94	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		2.60
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.06
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		60.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.39677	PF Power Coefficient (p)		0.73640





HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	12/28/2022
Agency	HRG	Analysis Year	2022
Jurisdiction	SDDOT	Time Analyzed	PM Peak
Project Description	WB 38 West of Hartford	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	10549
Measured FFS	Measured	Free-Flow Speed, mi/h	60.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	172	Opposing Demand Flow Rate, veh/h	111
Peak Hour Factor	0.90	Total Trucks, %	1.94
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.10

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	60.0
Speed Slope Coefficient (m)	4.37551	Speed Power Coefficient (p)	0.56943
PF Slope Coefficient (m)	-1.19248	PF Power Coefficient (p)	0.79019
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.7
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5280	-	-	59.0

Vehicle Results

Average Speed, mi/h	59.0	Percent Followers, %	25.7
Segment Travel Time, minutes	2.03	Follower Density (FD), followers/mi/ln	0.7
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	172	Bicycle Effective Width, ft	28
Bicycle LOS Score	1.35	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 2

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	2793
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		172	Opposing Demand Flow Rate, veh/h		111
Peak Hour Factor		0.90	Total Trucks, %		1.94
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.30491	Speed Power Coefficient (p)		0.56943
PF Slope Coefficient (m)		-1.16207	PF Power Coefficient (p)		0.83768
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2793	-	-	69.0
Vehicle Results					
Average Speed, mi/h		69.0	Percent Followers, %		23.4
Segment Travel Time, minutes		0.46	Follower Density (FD), followers/mi/ln		0.6
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		172	Bicycle Effective Width, ft		28
Bicycle LOS Score		1.35	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 3					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		3825
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		156	Opposing Demand Flow Rate, veh/h		89
Peak Hour Factor		0.90	Total Trucks, %		2.19
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.30611	Speed Power Coefficient (p)		0.57939
PF Slope Coefficient (m)		-1.13558	PF Power Coefficient (p)		0.84742
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3825	-	-	69.2

Vehicle Results

Average Speed, mi/h	69.2	Percent Followers, %	20.9
Segment Travel Time, minutes	0.63	Follower Density (FD), followers/mi/ln	0.5
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	156	Bicycle Effective Width, ft	29
Bicycle LOS Score	1.08	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 4

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	791
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	156	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	2.19
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.09

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29358	PF Power Coefficient (p)	0.75776
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.6
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	791	-	-	68.6

Vehicle Results

Average Speed, mi/h	68.6	Percent Followers, %	27.1
Segment Travel Time, minutes	0.13	Follower Density (FD), followers/mi/ln	0.6
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	156	Bicycle Effective Width, ft	29
Bicycle LOS Score	1.08	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		3414
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		156	Opposing Demand Flow Rate, veh/h		89
Peak Hour Factor		0.90	Total Trucks, %		2.19
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.30127	Speed Power Coefficient (p)		0.57939
PF Slope Coefficient (m)		-1.14184	PF Power Coefficient (p)		0.84531
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3414	-	-	69.2
Vehicle Results					
Average Speed, mi/h		69.2	Percent Followers, %		21.1
Segment Travel Time, minutes		0.56	Follower Density (FD), followers/mi/ln		0.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		156	Bicycle Effective Width, ft		29
Bicycle LOS Score		1.08	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		286
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		156	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		2.19
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29358	PF Power Coefficient (p)	0.75776
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.6
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	286	-	-	68.6

Vehicle Results

Average Speed, mi/h	68.6	Percent Followers, %	27.1
Segment Travel Time, minutes	0.05	Follower Density (FD), followers/mi/ln	0.6
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	156	Bicycle Effective Width, ft	29
Bicycle LOS Score	1.08	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 7

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	463
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	156	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	3.08
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.09

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29347	PF Power Coefficient (p)	0.75789
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.6
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	463	-	-	68.6

Vehicle Results

Average Speed, mi/h	68.6	Percent Followers, %	27.1
Segment Travel Time, minutes	0.08	Follower Density (FD), followers/mi/ln	0.6
Vehicle LOS	A		

Bicycle Results											
Percent Occupied Parking		0		Pavement Condition Rating		4					
Flow Rate Outside Lane, veh/h		156		Bicycle Effective Width, ft		29					
Bicycle LOS Score		1.32		Bicycle Effective Speed Factor		5.07					
Bicycle LOS		A									
Segment 8											
Vehicle Inputs											
Segment Type		Passing Zone		Length, ft		4822					
Measured FFS		Measured		Free-Flow Speed, mi/h		70.0					
Demand and Capacity											
Directional Demand Flow Rate, veh/h		156		Opposing Demand Flow Rate, veh/h		83					
Peak Hour Factor		0.90		Total Trucks, %		3.08					
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.09					
Intermediate Results											
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0					
Speed Slope Coefficient (m)		4.31376		Speed Power Coefficient (p)		0.58212					
PF Slope Coefficient (m)		-1.12268		PF Power Coefficient (p)		0.85072					
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		0.5					
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0					
Subsegment Data											
#	Segment Type		Length, ft		Radius, ft		Superelevation, %		Average Speed, mi/h		
1	Tangent		4822		-		-		69.2		
Vehicle Results											
Average Speed, mi/h			69.2			Percent Followers, %			20.6		
Segment Travel Time, minutes			0.79			Follower Density (FD), followers/mi/ln			0.5		
Vehicle LOS			A								
Bicycle Results											
Percent Occupied Parking			0			Pavement Condition Rating			4		
Flow Rate Outside Lane, veh/h			156			Bicycle Effective Width, ft			29		
Bicycle LOS Score			1.32			Bicycle Effective Speed Factor			5.07		
Bicycle LOS			A								
Segment 9											
Vehicle Inputs											
Segment Type			Passing Constrained			Length, ft			861		
Measured FFS			Measured			Free-Flow Speed, mi/h			70.0		
Demand and Capacity											

Directional Demand Flow Rate, veh/h		156	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		3.08
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29347	PF Power Coefficient (p)		0.75789
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	861	-	-	68.6
Vehicle Results					
Average Speed, mi/h		68.6	Percent Followers, %		27.1
Segment Travel Time, minutes		0.14	Follower Density (FD), followers/mi/ln		0.6
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		156	Bicycle Effective Width, ft		29
Bicycle LOS Score		1.32	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1556
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		156	Opposing Demand Flow Rate, veh/h		83
Peak Hour Factor		0.90	Total Trucks, %		3.08
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.27129	Speed Power Coefficient (p)		0.58212
PF Slope Coefficient (m)		-1.19156	PF Power Coefficient (p)		0.82314
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	1556	-	-	69.2
Vehicle Results					
Average Speed, mi/h		69.2	Percent Followers, %		22.7
Segment Travel Time, minutes		0.26	Follower Density (FD), followers/mi/ln		0.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		156	Bicycle Effective Width, ft		29
Bicycle LOS Score		1.32	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		799
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		156	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		3.08
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29347	PF Power Coefficient (p)		0.75789
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	799	-	-	68.6
Vehicle Results					
Average Speed, mi/h		68.6	Percent Followers, %		27.1
Segment Travel Time, minutes		0.13	Follower Density (FD), followers/mi/ln		0.6
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		156	Bicycle Effective Width, ft		29
Bicycle LOS Score		1.32	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 12					

Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		857
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		156	Opposing Demand Flow Rate, veh/h		83
Peak Hour Factor		0.90	Total Trucks, %		3.08
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.26688	Speed Power Coefficient (p)		0.58212
PF Slope Coefficient (m)		-1.20307	PF Power Coefficient (p)		0.81765
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	857	-	-	69.2
Vehicle Results					
Average Speed, mi/h		69.2	Percent Followers, %		23.1
Segment Travel Time, minutes		0.14	Follower Density (FD), followers/mi/ln		0.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		156	Bicycle Effective Width, ft		29
Bicycle LOS Score		1.32	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1288
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		156	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		3.08
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29347	PF Power Coefficient (p)		0.75789

In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.6
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1288	-	-	68.6

Vehicle Results

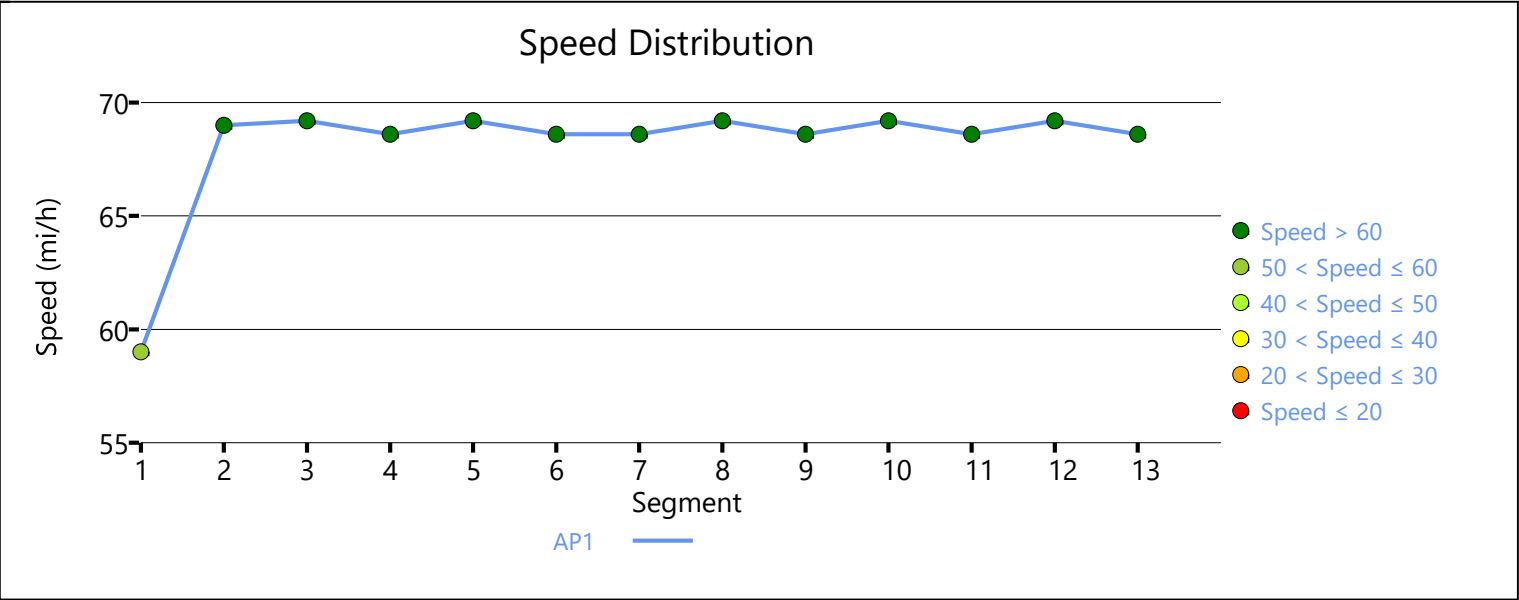
Average Speed, mi/h	68.6	Percent Followers, %	27.1
Segment Travel Time, minutes	0.21	Follower Density (FD), followers/mi/ln	0.6
Vehicle LOS	A		

Bicycle Results

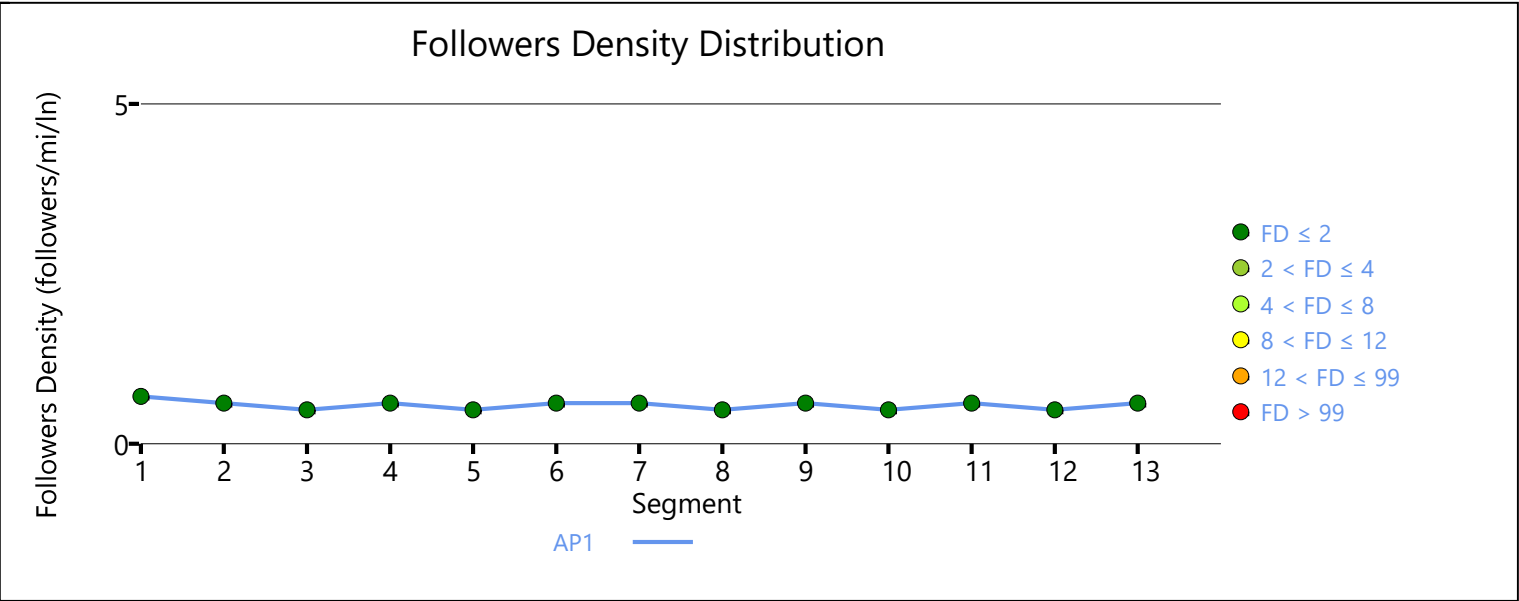
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	156	Bicycle Effective Width, ft	29
Bicycle LOS Score	1.32	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Facility Results

T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	224	0.05	0.6	A



AP1





Appendix C – Crash Data



← P P 12/23/20 12:30
S 2017742

← Vehicle Path	↩ U Turn
▢ Parked Vehicle	▢ Unknown dir.
↔ Backing Vehicle	↘ Ran off road
← Rear End	+ More Units
→ Head On	🚶 Pedestrian
↔ Sideswipe	▢ Fixed Object
↙ Left Turn	🐾 Wild Animal
↘ Right Turn	

◯ PDO
⊗ Injury
● Fatal

☀ Clear
☁ Cloudy
🌫 Fog
🌧 Rain
❄ Snow
☂ Wind

D- Dry
W- Wet
S- Winter
O- Other

💊 Drugs
🍷 Alcohol
📱 Distracted
🏎 Speed
😴 Fatigue
🚧 Work Zone

T -Truck
M-Motorcycle
P-Passenger
A-ATV
R-Tractor
E-Equipment
B-Bicycle
L -Railway

SD HWY 38 and 460 AVE



01/10/19 19:40
D 1905291



← Vehicle Path	↺ U Turn
▢ Parked Vehicle	▢ Unknown dir.
↔ Backing Vehicle	↘ Ran off road
← Rear End	+ More Units
→ Head On	🚶 Pedestrian
↔ Sideswipe	▢ Fixed Object
↙ Left Turn	🐾 Wild Animal
↘ Right Turn	

◯ PDO	☀ Clear
⊗ Injury	☁ Cloudy
● Fatal	🌫 Fog

D- Dry	🌧 Rain
W- Wet	❄ Snow
S- Winter	☁ Wind
O- Other	

💊 Drugs	T -Truck
🍷 Alcohol	M-Motorcycle
📱 Distracted	P-Passenger
🏎 Speed	A-ATV
😴 Fatigue	R-Tractor
🚧 Work Zone	E-Equipment
	B-Bicycle
	L -Railway

↑ ← P P ⊗ 01/12/20 14:37
S 🚶 2000512

SD HWY 38 and ELLIS RD





← P 03/02/21 11:29
↪ D 2103103

← Vehicle Path	↪ U Turn
↪ Parked Vehicle	↪ Unknown dir.
↪ Backing Vehicle	↪ Ran off road
← Rear End	↪ More Units
↪ Head On	↪ Pedestrian
↪ Sideswipe	↪ Fixed Object
↪ Left Turn	↪ Wild Animal
↪ Right Turn	

○ PDO
⊗ Injury
● Fatal

☀ Clear
☁ Cloudy
☂ Fog
☔ Rain
❄ Snow
☁ Wind

D- Dry
W- Wet
S- Winter
O- Other










💊 Drugs
🍷 Alcohol
📱 Distracted
🏎️ Speed
😴 Fatigue
🚧 Work Zone





T -Truck
M-Motorcycle
P-Passenger
A-ATV
R-Tractor
E-Equipment
B-Bicycle
L -Railway













↑↑ P P 02/02/19 08:42
↪ D 1905301








SD HWY 38 and COLTON RD




  P P 	01/28/20 05:24
 W 	2001424
  ? P 	07/30/22 21:19
 D	2209634

  P P 	09/05/18 16:00
 D	1813888





  P P 	02/23/18 08:08
 S	1803250
  P P 	02/27/18 18:16
 D	1805422
  P P 	04/16/18 18:54
 D	1808052







 Vehicle Path	 U Turn
 Parked Vehicle	 Unknown dir.
 Backing Vehicle	 Ran off road
 Rear End	 More Units
 Head On	 Pedestrian
 Sideswipe	 Fixed Object
 Left Turn	 Wild Animal
 Right Turn	


















 PDO	 Clear
 Injury	 Cloudy
 Fatal	 Fog

 Rain
 Snow
 Wind

D- Dry
W- Wet
S- Winter
O- Other

 Drugs	T -Truck
 Alcohol	M-Motorcycle
 Distracted	P-Passenger
 Speed	A-ATV
 Fatigue	R-Tractor
 Work Zone	E-Equipment
	B-Bicycle
	L -Railway

  P P 	06/14/21 04:59
 D	2108118
 P ? 	03/11/22 06:54
  D	2203089

 P 	06/08/21 00:00
  D 	2107625
  P P 	11/21/18 13:32
 D	1815307
 P P 	02/11/19 13:59
  W	1901866
 P P 	06/19/20 18:07
  D	2006968

SD HWY 38 E and MARION RD N



← P ⊗	10/04/19 22:20
▣ W	1915795
← P P ○	05/15/18 14:57
● D	1805593
← P P ⊗	09/17/19 16:35
● D	1912446
← P P ○	08/31/22 16:30
● D	2211069

← Vehicle Path	↺ U Turn
▣ Parked Vehicle	▣ Unknown dir.
↔ Backing Vehicle	↘ Ran off road
← Rear End	⊕ More Units
→ Head On	🚶 Pedestrian
↔ Sideswipe	▣ Fixed Object
↙ Left Turn	🐾 Wild Animal
↘ Right Turn	

○ PDO
⊗ Injury
● Fatal

● Clear
☁ Cloudy
🌫 Fog
🌧 Rain
❄ Snow
☁ Wind

D- Dry
W- Wet
S- Winter
O- Other

💊 Drugs
🍷 Alcohol
📱 Distracted
🏎 Speed
😴 Fatigue
🚧 Work Zone

T-Truck
M-Motorcycle
P-Passenger
A-ATV
R-Tractor
E-Equipment
B-Bicycle
L-Railway

SD HWY 38 and I 90 W1



11/22/19 14:25
D 1918396

← Vehicle Path	↺ U Turn
▢ Parked Vehicle	▢ Unknown dir.
↔ Backing Vehicle	↘ Ran off road
← Rear End	+ More Units
→ Head On	🚶 Pedestrian
↔ Sideswipe	▢ Fixed Object
↙ Left Turn	🐾 Wild Animal
↘ Right Turn	

◯ PDO	☀ Clear
⊗ Injury	☁ Cloudy
● Fatal	🌫 Fog

D- Dry	🌧 Rain
W- Wet	❄ Snow
S- Winter	☁ Wind
O- Other	

💊 Drugs	T -Truck
🍷 Alcohol	M-Motorcycle
📱 Distracted	P-Passenger
🏎 Speed	A-ATV
😴 Fatigue	R-Tractor
🚧 Work Zone	E-Equipment
	B-Bicycle
	L -Railway

SD HWY 38 and 462 AVE



↓ P P 05/27/20 12:26
↓ D 2006176

→ ↓ R P 10/15/18 09:50
↓ D 1813558

→ ↓ P P 12/26/20 07:35
↓ D 2017748

← Vehicle Path ↺ U Turn
▢ Parked Vehicle Unknown dir.
↔ Backing Vehicle ↘ Ran off road
← Rear End + More Units
→ Head On Pedestrian
↔ Sideswipe Fixed Object
↓ Left Turn Wild Animal
↪ Right Turn

○ PDO
⊗ Injury
● Fatal

☀ Clear
☁ Cloudy
🌫 Fog
🌧 Rain
❄ Snow
💨 Wind

D- Dry
W- Wet
S- Winter
O- Other

💊 Drugs
🍷 Alcohol
📱 Distracted
🏎 Speed
😴 Fatigue
🚧 Work Zone

T-Truck
M-Motorcycle
P-Passenger
A-ATV
R-Tractor
E-Equipment
B-Bicycle
L-Railway

SD HWY 38 and 470 AVE



← P ⊗ 12/26/21 19:00
↘ █ ☁ S 2119626
← ↓ P P ⊗ 06/18/22 23:15
↘ ● D ☁ 2207679

← Vehicle Path ↻ U Turn
▢ Parked Vehicle █ Unknown dir.
↔ Backing Vehicle ↘ Ran off road
← | Rear End + More Units
← | Head On 🚶 Pedestrian
↔ Sideswipe █ Fixed Object
↓ Left Turn 🐾 Wild Animal
↘ Right Turn

○ PDO
⊗ Injury
● Fatal

☀ Clear
☁ Cloudy
🌫 Fog
🌧 Rain
❄ Snow
☁ Wind

D- Dry
W- Wet
S- Winter
O- Other

💊 Drugs
🍷 Alcohol
📱 Distracted
🏎 Speed
😴 Fatigue
🚧 Work Zone

T -Truck
M-Motorcycle
P-Passenger
A-ATV
R-Tractor
E-Equipment
B-Bicycle
L -Railway

SD HWY 38 and 468 AVE



↓ P 01/28/21 20:35
S 2101049

→ R P 09/17/22 17:07
D 2211949

← Vehicle Path U Turn
Parked Vehicle Unknown dir.
Backing Vehicle Ran off road
← Rear End More Units
→ Head On Pedestrian
Sideswipe Fixed Object
Left Turn Wild Animal
Right Turn

○ PDO
⊗ Injury
● Fatal

D- Dry
W- Wet
S- Winter
O- Other

Clear
Cloudy
Fog
Rain
Snow
Wind

Drugs
Alcohol
Distracted
Speed
Fatigue
Work Zone

T -Truck
M-Motorcycle
P-Passenger
A-ATV
R-Tractor
E-Equipment
B-Bicycle
L -Railway

SD HWY 38 and SD HWY 19



↓ ← P P ○ 12/14/21 15:45
W 2119962

← Vehicle Path ↺ U Turn
▢ Parked Vehicle Unknown dir.
↔ Backing Vehicle ↘ Ran off road
←| Rear End + More Units
→| Head On 🚶 Pedestrian
↔ Sideswipe 🚚 Fixed Object
↓ Left Turn 🐾 Wild Animal
↘ Right Turn

○ PDO
⊗ Injury
● Fatal

☀ Clear
☁ Cloudy
🌫 Fog
🌧 Rain
❄ Snow
💨 Wind

D- Dry
W- Wet
S- Winter
O- Other

💊 Drugs
🍷 Alcohol
📱 Distracted
🏎 Speed
😴 Fatigue
🚧 Work Zone

T-Truck
M-Motorcycle
P-Passenger
A-ATV
R-Tractor
E-Equipment
B-Bicycle
L-Railway

SD HWY 38 and MAIN AVE



12/15/19 19:55
P S 1920267

Vehicle Path	U Turn
Parked Vehicle	Unknown dir.
Backing Vehicle	Ran off road
Rear End	More Units
Head On	Pedestrian
Sideswipe	Fixed Object
Left Turn	Wild Animal
Right Turn	

PDO
Injury
Fatal

Clear
Cloudy
Fog
Rain
Snow
Wind

D- Dry
W- Wet
S- Winter
O- Other

Drugs
Alcohol
Distracted
Speed
Fatigue
Work Zone

T -Truck
M-Motorcycle
P-Passenger
A-ATV
R-Tractor
E-Equipment
B-Bicycle
L -Railway

SD HWY 38 and CRESTVIEW DR



← Vehicle Path	↺ U Turn
▢ Parked Vehicle	▢ Unknown dir.
↔ Backing Vehicle	↘ Ran off road
← Rear End	+ More Units
→ Head On	🚶 Pedestrian
↔ Sideswipe	▢ Fixed Object
↙ Left Turn	🐾 Wild Animal
↘ Right Turn	

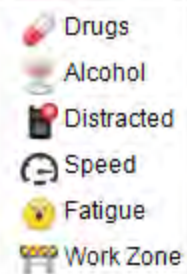


PDO
Injury
Fatal



Clear
Cloudy
Fog
Rain
Snow
Wind

D- Dry
W- Wet
S- Winter
O- Other



Drugs
Alcohol
Distracted
Speed
Fatigue
Work Zone

T -Truck
M-Motorcycle
P-Passenger
A-ATV
R-Tractor
E-Equipment
B-Bicycle
L -Railway

↙ ← TP 11/22/19 17:10
D 1917796

SD HWY 38 and 466 AVE



→ P R 03/21/19 19:00
D 1903145

← Vehicle Path	↺ U Turn
▢ Parked Vehicle	▢ Unknown dir.
↔ Backing Vehicle	↘ Ran off road
← Rear End	+ More Units
→ Head On	🚶 Pedestrian
↔ Sideswipe	▢ Fixed Object
↙ Left Turn	🐾 Wild Animal
↘ Right Turn	

◯ PDO
⊗ Injury
● Fatal

☀ Clear
☁ Cloudy
🌫 Fog
🌧 Rain
❄ Snow
💨 Wind

D- Dry
W- Wet
S- Winter
O- Other

💊 Drugs
🍷 Alcohol
📱 Distracted
🏎 Speed
😴 Fatigue
🚧 Work Zone

T -Truck
M-Motorcycle
P -Passenger
A-ATV
R-Tractor
E-Equipment
B-Bicycle
L -Railway

SD HWY 38 and 459 AVE



← P P 06/14/20 18:00
D 2007493

← Vehicle Path	↩ U Turn
▢ Parked Vehicle	▢ Unknown dir.
↔ Backing Vehicle	↘ Ran off road
← Rear End	+ More Units
→ Head On	🚶 Pedestrian
↔ Sideswipe	▢ Fixed Object
↙ Left Turn	🐾 Wild Animal
↘ Right Turn	

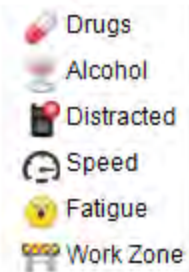


PDO
Injury
Fatal



Clear
Cloudy
Fog
Rain
Snow
Wind

D- Dry
W- Wet
S- Winter
O- Other



Drugs
Alcohol
Distracted
Speed
Fatigue
Work Zone

T -Truck
M-Motorcycle
P-Passenger
A-ATV
R-Tractor
E-Equipment
B-Bicycle
L -Railway

SD HWY 38 and 466 AVE



↓ → P P ☒ 10/05/22 15:57
D 2213435

→ ↓ P P ○ 10/08/18 14:42
D 1813553

→ P M ○ 05/23/20 18:50
→ ↻ D 2005832

← ↑ P P ☒ 10/29/18 17:41
D 1816365

← Vehicle Path	↻ U Turn
☐ Parked Vehicle	☐ Unknown dir.
↔ Backing Vehicle	↘ Ran off road
← Rear End	+ More Units
→ Head On	🚶 Pedestrian
↔ Sideswipe	☐ Fixed Object
↘ Left Turn	🐾 Wild Animal
↙ Right Turn	

○ PDO
☒ Injury
● Fatal

☀ Clear
☁ Cloudy
🌫 Fog
🌧 Rain
❄ Snow
💨 Wind

D- Dry
W- Wet
S- Winter
O- Other

💊 Drugs
🍷 Alcohol
📱 Distracted
🏎 Speed
😴 Fatigue
🚧 Work Zone

T -Truck
M-Motorcycle
P-Passenger
A-ATV
R-Tractor
E-Equipment
B-Bicycle
L -Railway

↑ ← P P ○ 12/13/18 10:30
D 1818582

↑ ↓ P P ○ 07/30/21 14:30
↑ 🌧 W 2114776

SD HWY 38 and 463 AVE



↓ → P P 01/28/20 05:24
W 2001424
↓ ← ? P 07/30/22 21:19
D 2209634

↓ ← P P 09/05/18 16:00
D 1813888

← | P P 02/23/18 08:08
S 1803250

← ↑ P P 02/27/18 18:16
D 1805422

↓ → P P 04/16/18 18:54
D 1808052

↑ P ? 03/11/22 06:54
T D 2203089

↑ P 06/08/21 00:00
D 2107625

↑ ← P P 11/21/18 13:32
D 1815307

↑ P P 06/19/20 18:07
T D 2006968

↑ ← P P 06/14/21 04:59
D 2108118

← Vehicle Path ↺ U Turn
▢ Parked Vehicle Unknown dir.
↔ Backing Vehicle ↘ Ran off road
← | Rear End + More Units
→ | Head On Pedestrian
↔ Sideswipe Fixed Object
↓ Left Turn Wild Animal
↘ Right Turn

○ PDO
⊗ Injury
● Fatal

☀ Clear
☁ Cloudy
🌫 Fog
🌧 Rain
❄ Snow
💨 Wind

D- Dry
W- Wet
S- Winter
O- Other

💊 Drugs
🍷 Alcohol
📱 Distracted
🏎 Speed
😴 Fatigue
🚧 Work Zone

T -Truck
M-Motorcycle
P-Passenger
A-ATV
R-Tractor
E-Equipment
B-Bicycle
L -Railway

SD HWY 38 W and MARION RD N



← P ⊗	10/04/19 22:20
▣ W	1915795
← P P ○	05/15/18 14:57
● D	1805593
← P P ⊗	09/17/19 16:35
● D	1912446
← P P ○	08/31/22 16:30
● D	2211069

← Vehicle Path	↺ U Turn
▣ Parked Vehicle	▣ Unknown dir.
↔ Backing Vehicle	↘ Ran off road
← Rear End	⊕ More Units
↔ Head On	🚶 Pedestrian
↺ Sideswipe	▣ Fixed Object
↙ Left Turn	🐾 Wild Animal
↘ Right Turn	

○ PDO
⊗ Injury
● Fatal

● Clear
☁ Cloudy
🌫 Fog
🌧 Rain
❄ Snow
☁ Wind

D- Dry
W- Wet
S- Winter
O- Other

💊 Drugs
🍷 Alcohol
📱 Distracted
🏎 Speed
😴 Fatigue
🚧 Work Zone

T-Truck
M-Motorcycle
P-Passenger
A-ATV
R-Tractor
E-Equipment
B-Bicycle
L-Railway

SD HWY 38 and I 90 W2



↓ ↓ P P 06/01/21 11:07
D 2107103

← P P 02/27/20 15:20
D 2003056

← Vehicle Path	↺ U Turn
▢ Parked Vehicle	▢ Unknown dir.
↔ Backing Vehicle	↘ Ran off road
← Rear End	+ More Units
→ Head On	🚶 Pedestrian
↔ Sideswipe	▢ Fixed Object
↙ Left Turn	🐾 Wild Animal
↘ Right Turn	

○ PDO
⊗ Injury
● Fatal

☀ Clear
☁ Cloudy
🌫 Fog
🌧 Rain
❄ Snow
💨 Wind

D- Dry
W- Wet
S- Winter
O- Other

💊 Drugs
🍷 Alcohol
📱 Distracted
🏎 Speed
😴 Fatigue
🚧 Work Zone

T-Truck
M-Motorcycle
P-Passenger
A-ATV
R-Tractor
E-Equipment
B-Bicycle
L-Railway

SD HWY 38 and 2ND ST

← P 01/05/18 19:15 D 1800312	← P 04/07/18 02:30 D 1810158	← P 06/15/18 12:20 D 1808938	← P 09/30/18 20:50 D 1812931	← P 10/24/18 19:58 D 1815999
← P 11/07/18 01:30 D 1814995	← P 01/03/19 18:31 D 1900081	← P 01/18/19 17:00 S 1900502	← P 02/12/19 08:42 S 1905632	← P 05/01/19 21:50 W 1904468
← P 05/17/19 02:25 W 1905494	← P 07/19/19 16:34 D 1909274	← P 07/25/19 18:00 D 1909596	← P 11/07/19 18:03 D 1916630	← P 11/09/19 05:20 D 1917006
← P 11/22/19 16:54 D 1917903	↓ P 11/14/18 19:30 D 1816784	← P P 01/02/18 14:29 S 1800061	← P P 02/10/18 12:28 D 1802197	← P P 03/26/18 16:51 W 1804142
← P P 06/01/18 15:50 D 1809254	← P P 03/14/19 13:33 S 1905423	← P P 04/05/19 09:18 D 1904193	← P P 07/02/19 15:41 D 1908980	← P P 09/20/19 16:11 D 1913864

→ P 06/08/18 07:00 D 1808054	→ M 09/14/18 18:17 D 1811894	→ P 09/29/18 18:30 D 1812849	→ P 10/24/18 06:30 D 1817448	→ P 11/03/18 06:30 W 1815581
→ P 11/06/18 17:30 D 1816366	→ P 11/13/18 18:50 D 1818676	→ P 12/01/18 04:45 S 1815735	→ P 12/09/18 18:25 D 1817678	→ P 12/25/18 18:45 D 1817938
→ P 08/05/19 05:45 D 1910161	→ P 08/23/19 07:00 D 1911451	→ P 10/14/19 06:30 D 1914281	→ P 10/26/19 06:54 D 1915799	→ P 02/29/20 19:23 D 2002941
→ P 03/02/20 23:25 D 2003312	→ P 04/16/20 05:40 D 2004496	→ P 09/08/20 20:00 D 2010577	→ P 09/28/20 06:40 D 2011798	→ P 10/20/20 07:00 W 2013338
→ P M 07/08/18 11:40 D 1808530	→ P P 12/31/18 11:05 S 1817745	→ P P 03/05/19 09:15 S 1905287	→ T T 04/12/19 10:28 S 1903696	→ M P 08/29/20 18:41 D 2010485

← Vehicle Path	↺ U Turn	○ PDO	☀ Clear	🚑 Drugs	T - Truck
🚗 Parked Vehicle	🚗 Unknown dir.	⊗ Injury	☁ Cloudy	🍷 Alcohol	M - Motorcycle
↺ Backing Vehicle	🚗 Ran off road	● Fatal	🌫 Fog	📱 Distracted	P - Passenger
← Rear End	⛶ More Units		🌧 Rain	🚗 Speed	A - ATV
→ Head On	🚶 Pedestrian		❄ Snow	🚗 Fatigue	R - Tractor
↺ Sideswipe	🚗 Fixed Object		🌬 Wind	🚧 Work Zone	E - Equipment
↺ Left Turn	🐾 Wild Animal				B - Bicycle
↺ Right Turn					L - Railway
		D - Dry			
		W - Wet			
		S - Winter			
		O - Other			

3 crashes not placed



← P 01/06/20 18:20 D 2000159	← P 01/11/20 21:15 S 2000328	← P 01/14/20 19:20 D 2000845	← P 01/21/20 14:55 S 2000855	← P 03/24/20 21:27 D 2003922
← P 04/16/20 21:50 D 2004491	← P 04/25/20 21:00 D 2004975	← P 06/14/20 02:00 D 2006664	← P 06/29/20 15:02 D 2007632	← P 07/02/20 21:54 D 2007496
← P 08/10/20 22:30 D 2009651	← P 10/25/20 11:47 S 2013727	← P 10/26/20 20:20 D 2013341	← P 11/20/20 18:06 D 2015218	← P 12/13/20 00:20 D 2017786
← P 03/01/21 02:30 S 2104069	← P 04/27/21 13:20 D 2105756	← P P 04/22/20 13:05 D 2004840	← P P 05/17/20 16:01 D 2005599	← P P 11/08/20 17:5 D 2014234
← P P 11/25/20 12:35 D 2016130	← R P 12/23/20 11:18 S 2017346	← P P 12/23/20 14:30 S 2017543	← P E 05/02/21 21:20 D 2108991	← P P 05/05/21 16:25 D 2105762

→ P 11/03/20 17:55 D 2014574	→ P 12/08/20 17:50 D 2016842	→ P 12/08/20 19:55 D 2016132	→ P 01/07/21 20:10 D 2100257	→ P 02/23/21 06:30 D 2102390
→ P 05/07/21 01:10 D 2105821	→ P 07/20/21 06:20 D 2109553	→ P 10/14/21 06:27 D 2114264	→ P 10/14/21 07:08 D 2114265	→ P 10/28/21 07:21 D 2115394
→ P 11/15/21 18:42 D 2116833	→ P 12/08/21 18:59 D 2118211	→ P 02/03/22 08:20 D 2201438	→ P 04/23/22 14:00 D 2204795	→ P 05/15/22 04:28 D 2205660
→ E P 12/04/20 18:40 D 2016246	→ P T 02/17/21 07:50 S 2102271	→ P P 03/16/21 15:38 W 2103917	→ P P 07/31/21 15:44 D 2110772	→ P P 09/01/21 15:3 D 2112971
→ P P 10/28/21 09:46 D 2115369	→ P P 12/15/21 08:20 W 2119748	→ P P 12/30/21 18:22 D 2120005	→ P P 05/09/22 15:37 D 2205551	→ P P 06/10/22 17:3 D 2207407

← Vehicle Path	↺ U Turn	○ PDO	☀ Clear	🚑 Drugs	T - Truck
🚗 Parked Vehicle	📍 Unknown dir.	⊗ Injury	☁ Cloudy	🍷 Alcohol	M - Motorcycle
↔ Backing Vehicle	🏃 Ran off road	● Fatal	🌫 Fog	📱 Distracted	P - Passenger
← Rear End	✚ More Units		🌧 Rain	🚗 Speed	A - ATV
→ Head On	🚶 Pedestrian		❄ Snow	🚛 Fatigue	R - Tractor
↔ Sideswipe	🚧 Fixed Object		🌬 Wind	🚧 Work Zone	E - Equipment
↺ Left Turn	🐾 Wild Animal				B - Bicycle
↻ Right Turn					L - Railway
		D - Dry			
		W - Wet			
		S - Winter			
		O - Other			



← P ○ 06/16/21 21:14 D 2108380	← P ○ 06/22/21 23:30 D 2108381	← P ○ 09/30/21 22:10 W 2113360	← P ○ 10/02/21 19:36 D 2113713	← P ○ 11/19/21 19:00 D 2117105
← P ○ 12/03/21 18:23 D 2118113	← P ○ 12/13/21 21:00 D 2118493	← P ○ 06/08/22 18:14 D 2206805	← P ○ 06/12/22 10:44 D 2207577	← P P ○ 01/28/22 10:45 D 2201188
← → P ? ○ 03/29/22 11:59 D 2203956	← P M ⊗ 07/10/22 00:00 D 2209058	← P P ⊗ 10/23/22 23:52 D 2214125	← P P ○ 12/05/22 17:26 D 2217070	← P A ● 12/17/22 18:36 S 2218937

→ P ○ 06/10/22 22:38 D 2207330	→ P ○ 07/05/22 18:40 D 2208451	→ P ○ 08/30/22 20:08 D 2211257	→ P ○ 09/12/22 20:41 D 2211639	→ P ○ 09/26/22 01:25 D 2212353
→ P ○ 10/05/22 06:56 W 2212972	→ P ○ 10/28/22 21:30 D 2215500	→ P ○ 11/05/22 20:54 D 2214953	→ P ○ 11/13/22 19:32 D 2215381	→ P P ⊗ 08/16/22 13:33 D 2210607
← → P P ○ 12/22/22 14:40 S 2219025				

← Vehicle Path ▢ Parked Vehicle ↔ Backing Vehicle ← → Rear End →← Head On ↻ Sideswipe ↵ Left Turn ↶ Right Turn	↻ U Turn ▢ Unknown dir. ↵ Ran off road + More Units 👤 Pedestrian ▢ Fixed Object 🐾 Wild Animal	○ PDO ⊗ Injury ● Fatal D - Dry W - Wet S - Winter O - Other	☀ Clear ☁ Cloudy 🌫 Fog 🌧 Rain ❄ Snow 🌬 Wind	🚰 Drugs 🍷 Alcohol 📱 Distracted ⚡ Speed 😴 Fatigue 🚧 Work Zone	T - Truck M - Motorcycle P - Passenger A - ATV R - Tractor E - Equipment B - Bicycle L - Railway
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HIGHWAY 038

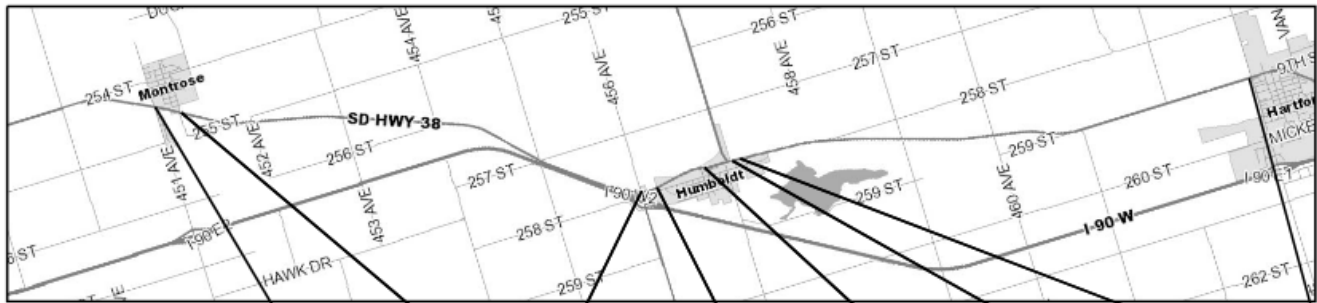
Beginning MRM = 342.66
Ending MRM = 350.04

RURAL



HIGHWAY 038

Beginning MRM = 342.66
Ending MRM = 350.04



IDENTIFICATION								
Federal Aid System	STP	STP	STP	STP	STP	STP	STP	STP
Funding Category	MUNI	SEC	MINA	MUNI	MUNI	SEC	SEC	SEC
Functional Classification	R-MA C	R-MA C	R-MI A	R-MI A	R-MI A	R-MA C	R-MA C	R-MA C
Direction								
Beginning MRM	342.66	343.05	348.91	349.07	349.63	350.04	350.04	350.04
MRM Displacement	0.000	0.011	0.000	0.006	0.039	0.000	0.095	0.095
Segment Length	0.341	5.896	0.183	0.590	0.331	0.095	5.979	5.979
Year Built	1948	1948	1989	1989	1948	1948	1948	1948
Year Last Improved	2006	2006	2012	2012	2012	2012	2012	2012
Year Last Sealed	2015	2015	2014	2014	2014	2014	2014	2014
ROADWAY CONDITIONS								
Surface Condition Index	3.60	3.66	4.27	4.30	4.30	4.30	4.37	4.37
Roughness Index	3.83 (19)	3.87 (19)	4.27 (19)	4.54 (19)	4.11 (19)	4.54 (19)	4.67 (19)	4.67 (19)
ASPHALT INDEX VALUES								
Transverse Cracking	3.96 (19)	4.16 (19)	4.67 (19)	4.50 (19)	4.50 (19)	4.50 (19)	4.69 (19)	4.69 (19)
Fatigue Cracking	4.60 (19)	4.41 (19)	4.37 (19)	4.71 (19)	4.60 (19)	4.60 (19)	4.68 (19)	4.68 (19)
Patching/Patch Deterioration	5.00 (19)	5.00 (19)	5.00 (19)	5.00 (19)	5.00 (19)	5.00 (19)	5.00 (19)	5.00 (19)
Block Cracking	3.52 (19)	3.65 (19)	4.30 (19)	4.30 (19)	4.30 (19)	4.30 (19)	4.25 (19)	4.25 (19)
Rut Index	4.52 (19)	4.41 (19)	4.38 (19)	4.55 (19)	4.63 (19)	4.61 (19)	4.69 (19)	4.69 (19)
Rut Depth(Inches) AVG/MAX	0.10 / 0.20	0.20 / 0.70	0.20 / 0.40	0.10 / 0.20	0.10 / 0.20	0.10 / 0.10	0.10 / 0.20	0.10 / 0.20
CONCRETE INDEX VALUES								
D-Cracking/ASR								
Joint Spalling								
Cornor Cracking								
Faulting / CRCP Block Cracking								
Joint Seal Damage								
Punchouts								
STRUCTURAL DESCRIPTION								
Surface Type	AONC	AONC	THK	THK	AONC	AONC	AONC	AONC
Shoulder Type - Primary/Secondary	AC/N/D	AC/N/D	AC/N/D	AC/N/D	AC/N/D	AC/N/D	AC/N/D	AC/N/D
Surface Width	24 (024)	24 (024)	24 (024)	24 (024)	24 (024)	24 (024)	24 (024)	24 (024)
Left Shoulder Width-Prim/Sec	4 (04) / 0 (0)	4 (04) / 0 (0)	6 (06) / 0 (0)	6 (06) / 0 (0)	6 (06) / 0 (0)	6 (06) / 0 (0)	5 (05) / 0 (0)	5 (05) / 0 (0)
Right Shoulder Width-Prim/Sec	4 (04) / 0 (0)	4 (04) / 0 (0)	6 (06) / 0 (0)	6 (06) / 0 (0)	6 (06) / 0 (0)	6 (06) / 0 (0)	5 (05) / 0 (0)	5 (05) / 0 (0)
Widths-RDWY/ROW-Predom/Min	032/132/132	032/132/132	036/132/126	036/126/100	036/100/100	036/132/132	034/132/132	034/132/132
Roadbed Layer 1	2015/TS3/0.4	2015/TS3/0.4	2016/TC/0.0	2016/TC/0.0	2016/TC/0.0	2016/TC/0.0	2016/TC/0.0	2016/TC/0.0
Roadbed Layer 2	2008/TS3/0.4	2008/TS3/0.4	2014/TS3/0.4	2014/TS3/0.4	2014/TS3/0.4	2014/TS3/0.4	2014/TS3/0.4	2014/TS3/0.4
Roadbed Layer 3	2008/TC/0.0	2008/TC/0.0	2013/TC/0.0	2013/TC/0.0	2013/TC/0.0	2013/TC/0.0	2013/TC/0.0	2013/TC/0.0
Roadbed Layer 4	2006/AL3/2.0	2006/AL3/2.0	2012/AJ3/2.0	2012/AJ3/2.0	2012/AJ3/2.0	2012/AJ3/2.0	2012/AJ3/2.0	2012/AJ3/2.0
Roadbed Layer 5	1985/AD3/2.5	1985/AD3/2.5	1989/AG3/4.0	1989/AG3/4.0	1989/AG3/1.0	1989/AG3/1.0	1987/AD3/2.5	1987/AD3/2.5
Roadbed Layer 6	1985/CS/0.0	1985/CS/0.0	1989/BU5/16.0	1989/BU5/16.0	1989/AG3/2.0	1989/AG3/2.0	1948/CP1/6.0	1948/CP1/6.0
Roadbed Layer 7	1948/CP1/9.0	1948/CP1/9.0			1948/CP1/9.0	1948/CP1/9.0	1948/BU1/6.0	1948/BU1/6.0
Roadbed Layer 8	1948/BU1/6.0	1948/BU1/6.0			1948/BU1/6.0	1948/BU1/6.0		
Roadbed Layer 9								
Roadbed Layer 10								
Roadbed Layer 11								
Roadbed Layer 12								
Number Of Structures	0	1	0	0	0	0	0	0
Number Of Box Culverts	1	0	0	0	0	0	0	0
3 YR AVG MAINTENANCE COSTS								
Mainline	\$2208	\$2208	\$2475	\$2473	\$2474	\$2474	\$153	\$153
Shoulders	\$164	\$163	\$257	\$258	\$257	\$253	\$68	\$68
Structure	\$53	\$53	\$0	\$0	\$0	\$0	\$0	\$0
Other	\$3821	\$3821	\$15557	\$15559	\$15559	\$15558	\$6963	\$6963
Total	\$6246	\$6245	\$18290	\$18290	\$18290	\$18295	\$7184	\$7184
Total 3 Year Main Contract Amount	\$129	\$128	\$1863	\$1863	\$1861	\$1863	\$735	\$735
TRAFFIC								
Current ADT	1029	1545	2302	2302	2269	2116	2116	2116
Projected 20 Year ADT	1338	2008	3513	3513	3463	3229	3229	3229
Number Of Trucks	111	148	134	134	132	121	121	121
CRASHES								
Weighted Crash Rate	4.26	1.74	1.19	0.48	0.48	0.26	1.86	1.86
Number Of Fatal	0	0	0	0	0	0	0	0
Number Of Injury	1	1	0	0	0	0	6	6
Number Of Property Damage	5	26	5	2	2	1	25	25
MAINLINE IMPROVEMENTS								
Project Programmed	YES	YES	YES	YES	YES	YES	YES	YES
PCN	05UR	05UR	07K4	07K4	07K4	07K4	07K4	07K4
Improvement Type	MILL AC OVLY	MILL AC OVLY	CHIP SEAL	CHIP SEAL	CHIP SEAL	CHIP SEAL	CHIP SEAL	CHIP SEAL
Estimated Improvement Cost	\$91	\$1571	\$6	\$18	\$10	\$3	\$181	\$181
Improvement Year	2023	2023	2021	2022	2022	2021	2021	2021
PCN								
Improvement Type	ROUTE/SEAL	ROUTE/SEAL	COLD TP RCYL	MILL AC OVLY	COLD TP RCYL	COLD TP RCYL	COLD TP RCYL	COLD TP RCYL
Estimated Improvement Cost	\$3	\$1571	\$6	\$376	\$138	\$3	\$181	\$181
Improvement Year	2025	2025	2026	2030	2027	2028	2028	2028

HIGHWAY 038

Beginning MRM = 356.00
Ending MRM = 359.27

RURAL



HIGHWAY 038

Beginning MRM = 356.00
Ending MRM = 359.27

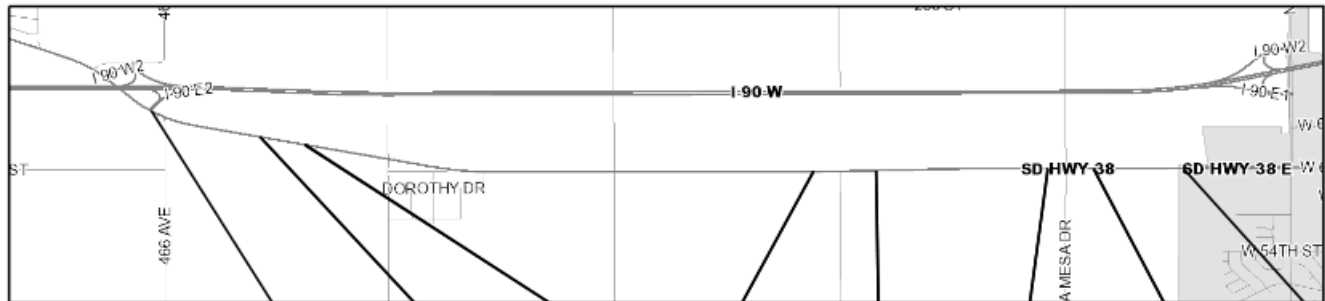

IDENTIFICATION								
Federal Aid System	STP	STP	STP	STP	STP	STP	STP	STP
Funding Category	SEC	MUNI	MUNI	SEC	SEC	SEC	SEC	MINA
Functional Classification	R-MA C	R-MA C	R-MA C	R-MA C	R-MA C	R-MA C	R-MA C	R-MI A
Direction								
Beginning MRM	356.00	356.00	356.69	357.17	358.00	359.00	359.27	
MRM Displacement	0.120	0.135	0.018	0.000	0.537	0.051	0.000	
Segment Length	0.015	0.581	0.449	1.369	0.507	0.337	0.286	
Year Built	1994	1994	1950	1950	1950	1950	1950	
Year Last Improved	1994	1994	2012	2012	2012	2012	2012	
Year Last Sealed			2014	2014	2014	2014	2014	
ROADWAY CONDITIONS								
Surface Condition Index	1.42	1.40	4.30	4.43	3.99	4.32	4.46	
Roughness Index	2.72 (19)	3.50 (19)	4.76 (19)	4.79 (19)	4.50 (19)	4.70 (19)	4.60 (19)	
ASPHALT INDEX VALUES								
Transverse Cracking			4.50 (19)	4.51 (19)	4.63 (19)	4.50 (19)	4.50 (19)	
Fatigue Cracking			5.00 (19)	4.78 (19)	4.96 (19)	4.60 (19)	4.60 (19)	
Patching/Patch Deterioration			5.00 (19)	5.00 (19)	5.00 (19)	5.00 (19)	5.00 (19)	
Block Cracking			4.30 (19)	4.43 (19)	4.30 (19)	4.30 (19)	4.73 (19)	
Rut Index			4.65 (19)	4.55 (19)	3.84 (19)	4.54 (19)	4.46 (19)	
Rut Depth(Inches) AVG/MAX			0.10 / 0.20	0.10 / 0.90	0.30 / 0.70	0.10 / 0.30	0.20 / 0.60	
CONCRETE INDEX VALUES								
D-Cracking/ASR	5.00 (19)	5.00 (19)						
Joint Spalling	1.40 (19)	1.40 (19)						
Corner Cracking	4.20 (19)	4.68 (19)						
Faulting / CRCP Block Cracking	4.41 (19)	4.62 (19)						
Joint Seal Damage	1.40 (19)	1.40 (19)						
Punchouts	5.00 (19)	5.00 (19)						
STRUCTURAL DESCRIPTION								
Surface Type	TKSJD	TKSJD	AONC	AONC	AONC	AONC	AONC	
Shoulder Type - Primary/Secondary	PCCP/N/D	C & G/N/D	AC/GRVL	AC/GRVL	AC/GRVL	AC/GRVL	AC/GRVL	
Surface Width	36 (036)	52 (052)	24 (024)	24 (024)	36 (036)	24 (024)	36 (036)	
Left Shoulder Width-Prim/Sec	11 (11) / 0 (0)	2 (02) / 0 (0)	5 (05) / 3 (3)	5 (05) / 3 (3)	5 (05) / 3 (3)	5 (05) / 3 (3)	5 (05) / 3 (3)	
Right Shoulder Width-Prim/Sec	11 (11) / 0 (0)	2 (02) / 0 (0)	5 (05) / 3 (3)	5 (05) / 3 (3)	5 (05) / 3 (3)	5 (05) / 3 (3)	5 (05) / 3 (3)	
Widths-RDWY/ROW-Freedom/Min	058/150/150	056/150/150	040/150/150	040/150/150	052/150/150	040/150/150	052/150/150	
Roadbed Layer 1	1994/CD1/8.0	1994/CD1/8.0	2016/TC/0.0	2016/TC/0.0	2016/TC/0.0	2016/TC/0.0	2016/TC/0.0	
Roadbed Layer 2	1994/BU3/5.0	1994/BU3/5.0	2014/TS3/0.4	2014/TS3/0.4	2014/TS3/0.4	2014/TS3/0.4	2014/TS3/0.4	
Roadbed Layer 3			2013/TC/0.0	2013/TC/0.0	2013/TC/0.0	2013/TC/0.0	2013/TC/0.0	
Roadbed Layer 4			2012/AJ3/2.0	2012/AJ3/2.0	2012/AJ3/2.0	2012/AJ3/2.0	2012/AJ3/2.0	
Roadbed Layer 5			1992/AG5/0.5	1992/AG5/0.5	1992/AG5/0.5	1992/AG5/0.5	1992/AG5/0.5	
Roadbed Layer 6			1992/AG5/3.0	1992/AG5/3.0	1992/AG5/3.0	1992/AG5/3.0	1992/AG5/3.0	
Roadbed Layer 7			1950/CP1/8.0	1950/CP1/8.0	1950/CP1/8.0	1950/CP1/8.0	1950/CP1/8.0	
Roadbed Layer 8			1950/BU1/6.0	1950/BU1/6.0	1950/BU1/6.0	1950/BU1/6.0	1950/BU1/6.0	
Roadbed Layer 9								
Roadbed Layer 10								
Roadbed Layer 11								
Roadbed Layer 12								
Number Of Structures	0	0	0	0	0	0	0	
Number Of Box Culverts	0	0	0	0	0	1	0	
3 YR AVG MAINTENANCE COSTS								
Mainline	\$200	\$210	\$267	\$267	\$266	\$267	\$266	
Shoulders	\$133	\$115	\$73	\$73	\$73	\$74	\$73	
Structure	\$0	\$0	\$82	\$83	\$83	\$83	\$84	
Other	\$11333	\$11313	\$8967	\$8967	\$8966	\$8967	\$8969	
Total	\$11667	\$11639	\$9390	\$9390	\$9391	\$9389	\$9392	
Total 3 Year Main Contract Amount	\$1467	\$1466	\$6383	\$6382	\$6383	\$6383	\$6381	
TRAFFIC								
Current ADT	2116	3505	3532	4275	4275	4275	4151	
Projected 20 Year ADT	3229	5349	5390	6524	6524	6524	6335	
Number Of Trucks	121	102	102	107	107	107	98	
CRASHES								
Weighted Crash Rate	0.00	1.88	0.31	1.97	0.39	1.67	0.40	
Number Of Fatal	0	0	0	0	0	0	0	
Number Of Injury	0	2	0	3	0	3	1	
Number Of Property Damage	0	6	2	12	3	4	0	
MAINLINE IMPROVEMENTS								
Project Programmed	YES	YES	YES	YES	YES	YES	YES	
PCN	06Y9	06Y9	07K4	07K4	07K4	07K4	07K4	
Improvement Type	PAV RESTORE1	PAV RESTORE1	CHIP SEAL	CHIP SEAL	CHIP SEAL	CHIP SEAL	CHIP SEAL	
Estimated Improvement Cost	\$1	\$27	\$13	\$41	\$15	\$10	\$9	
Improvement Year	2021	2021	2023	2021	2021	2021	2021	
PCN								
Improvement Type	CRK SEAT ACO	SEAL JNTS	COLD IP RCYL	COLD IP RCYL	MILL AC OVLY	COLD IP RCYL	COLD IP RCYL	
Estimated Improvement Cost	\$1	\$31	\$187	\$41	\$15	\$10	\$9	
Improvement Year	2032	2032	2029	2028	2029	2028	2028	

HIGHWAY 038 Beginning MRM = 359.63 Ending MRM = 363.85

RURAL



HIGHWAY 038 Beginning MRM = 359.63 Ending MRM = 363.85



IDENTIFICATION							
Federal Aid System	STP	STP	STP	STP	STP	STP	STP
Funding Category	MINA	MINA	MINA	MINA	MINA	MINA	MINA
Functional Classification	R-MI A	R-MI A	R-MI A	R-MI A	R-MI A	R-MI A	R-MI A
Direction							
Beginning MRM	359.63	360.00	360.22	362.45	362.75	363.00	363.85
MRM Displacement	0.000	0.138	0.114	0.156	0.156	0.652	0.000
Segment Length	0.512	0.203	2.276	0.278	0.753	0.211	0.396
Year Built	1950	1986	1950	1950	1950	1950	1950
Year Last Improved	2012	1986	2012	2012	2012	2012	2012
Year Last Sealed	2014		2014	2014	2014	2014	2014
ROADWAY CONDITIONS							
Surface Condition Index	4.29	0.39	4.35	4.04	4.23	4.03	4.23
Roughness Index	4.72 (19)	0.39 (19)	4.84 (19)	4.63 (19)	4.72 (19)	4.31 (19)	4.62 (19)
ASPHALT INDEX VALUES							
Transverse Cracking	4.50 (19)		4.50 (19)	4.50 (19)	4.50 (19)	4.66 (19)	4.60 (19)
Fatigue Cracking	4.84 (19)		4.82 (19)	4.60 (19)	4.52 (19)	4.41 (19)	4.87 (19)
Patching/Patch Deterioration	5.00 (19)		5.00 (19)	5.00 (19)	5.00 (19)	5.00 (19)	5.00 (19)
Block Cracking	4.19 (19)		4.30 (19)	4.04 (19)	4.23 (19)	4.03 (19)	4.13 (19)
Rut Index	4.63 (19)		4.58 (19)	4.12 (19)	4.27 (19)	4.13 (19)	4.44 (19)
Rut Depth (Inches) AVG/MAX	0.10 / 0.60		0.10 / 0.40	0.20 / 0.60	0.20 / 0.60	0.20 / 0.70	0.20 / 0.70
CONCRETE INDEX VALUES							
D-Cracking/ASR		5.00 (19)					
Joint Spalling		2.30 (19)					
Corner Cracking		5.00 (19)					
Faulting / CRCP Block Cracking		3.06 (19)					
Joint Seal Damage		2.30 (19)					
Punchouts		5.00 (19)					
STRUCTURAL DESCRIPTION							
Surface Type	AONC	TKS	AONC	AONC	AONC	AONC	AONC
Shoulder Type - Primary/Secondary	AC/GRVL	PCCP/AC	AC/GRVL	AC/GRVL	AC/GRVL	AC/GRVL	AC/GRVL
Surface Width	24 (024)	24 (024)	24 (024)	36 (036)	24 (024)	36 (036)	24 (024)
Left Shoulder Width-Prim/Sec	5 (05) / 3 (3)	3 (03) / 5 (5)	4 (04) / 4 (4)	4 (04) / 4 (4)	4 (04) / 4 (4)	4 (04) / 4 (4)	4 (04) / 4 (4)
Right Shoulder Width-Prim/Sec	5 (05) / 3 (3)	3 (03) / 5 (5)	4 (04) / 4 (4)	4 (04) / 4 (4)	4 (04) / 4 (4)	4 (04) / 4 (4)	4 (04) / 4 (4)
Widths-RDWD/ROW-Predom/Min	040/150/150	040/150/150	040/150/150	052/150/150	040/157/150	052/157/157	040/157/157
Roadbed Layer 1	2016/TC/0.0	1986/CP1/8.0	2016/TC/0.0	2016/TC/0.0	2016/TC/0.0	2016/TC/0.0	2016/TC/0.0
Roadbed Layer 2	2014/TS3/0.4	1986/BU5/6.0	2014/TS3/0.4	2014/TS3/0.4	2014/TS3/0.4	2014/TS3/0.4	2014/TS3/0.4
Roadbed Layer 3	2013/TC/0.0		2013/TC/0.0	2013/TC/0.0	2013/TC/0.0	2013/TC/0.0	2013/TC/0.0
Roadbed Layer 4	2012/AJ3/2.0		2012/AJ3/2.0	2012/AJ3/2.0	2012/AJ3/2.0	2012/AJ3/2.0	2012/AJ3/2.0
Roadbed Layer 5	1992/AG5/3.0		1993/AG5/3.5	1993/AG5/3.5	1993/AG5/3.5	1993/AG5/3.5	1993/AG5/3.5
Roadbed Layer 6	1992/AG5/3.0		1950/CP1/8.0	1950/CP1/8.0	1950/CP1/8.0	1950/CP1/8.0	1950/CP1/8.0
Roadbed Layer 7	1950/CP1/8.0		1950/BU1/6.0	1950/BU1/6.0	1950/BU1/6.0	1950/BU1/6.0	1950/BU1/6.0
Roadbed Layer 8	1950/BU1/6.0						
Roadbed Layer 9							
Roadbed Layer 10							
Roadbed Layer 11							
Roadbed Layer 12							
Number Of Structures	0	1	0	0	0	0	0
Number Of Box Culverts	0	0	1	0	1	1	0
3 YR AVG MAINTENANCE COSTS							
Mainline	\$268	\$635	\$109	\$108	\$109	\$109	\$109
Shoulders	\$72	\$340	\$71	\$72	\$70	\$71	\$71
Structure	\$82	\$394	\$360	\$360	\$360	\$360	\$359
Other	\$8967	\$33261	\$6959	\$6957	\$6959	\$6957	\$6960
Total	\$9391	\$34631	\$7498	\$7496	\$7498	\$7498	\$7497
Total 3 Year Main Contract Amount	\$6383	\$3729	\$774	\$773	\$774	\$773	\$773
TRAFFIC							
Current ADT	4104	4104	4104	4784	5316	5316	5316
Projected 20 Year ADT	6263	6263	6263	7301	8112	8112	8112
Number Of Trucks	94	94	94	113	128	128	128
CRASHES							
Weighted Crash Rate	1.20	0.53	1.06	0.34	0.21	0.31	0.83
Number Of Fatal	0	0	0	0	0	0	0
Number Of Injury	2	1	2	0	0	1	1
Number Of Property Damage	3	1	12	3	2	0	5
MAINLINE IMPROVEMENTS							
Project Programmed	YES	YES	YES	YES	YES	YES	YES
PCN	07K4	06Y9	07K4	07K4	07K4	07K4	07K4
Improvement Type	CHIP SEAL	PAV RESTORE	CHIP SEAL	CHIP SEAL	CHIP SEAL	CHIP SEAL	CHIP SEAL
Estimated Improvement Cost	\$15	\$10	\$69	\$8	\$23	\$6	\$12
Improvement Year	2021	2021	2021	2021	2021	2021	2021
PCN							
Improvement Type	COLD IP RCYL	PCCP RESURF	COLD IP RCYL	MILL AC OVLY	COLD IP RCYL	COLD IP RCYL	COLD IP RCYL
Estimated Improvement Cost	\$15	\$10	\$69	\$8	\$23	\$6	\$12
Improvement Year	2028	2034	2028	2029	2027	2026	2028

APPENDIX A2: FUTURE NO-BUILD TRAFFIC OPERATIONS AND SAFETY ANALYSIS

SD38 Corridor Study



To: Steve Gramm, SDDOT

From: Chase Cutler, PE, PTOE / Ben White, PE

Subject: SD Highway 38 – Future No-Build Traffic Operations and Safety Analysis

Date: January 16, 2024

Introduction

The South Dakota Department of Transportation (SDDOT), City of Hartford, Town of Humboldt, City of Sioux Falls, Sioux Falls Metropolitan Planning Organization (MPO), Minnehaha County, and Federal Highway Administration (FHWA) initiated an assessment of approximately 14.2 miles of the SD Highway 38 (SD 38) corridor from the SD Highway 19 intersection in Humboldt, South Dakota to the Marion Road intersection in Sioux Falls, South Dakota. The study segment of SD 38 is predominantly a rural two-lane highway and located in a rapidly developing area and serves as a viable alternate route to Interstate-90. Development pressure is expected to impact the SD 38 corridor with higher traffic volumes, greater demand for multi-modal (bike and pedestrian) uses, and additional access management concerns.

Segments of the SD 38 corridor are expected to need major rehabilitation or reconstruction within the next 10 to 15 years. Primary concerns of this study are to ensure the roadway is reconstructed to meet future traffic volume demands.

The purpose of this technical memorandum is to document the future no-build traffic assessment in support of the study being completed along SD 38. This technical report will provide a future year conditions assessment of the two-lane highway and at each of the study intersections. **Table 1** depicts the eighteen study intersections reviewed as part of the existing conditions assessment and traffic data review.

TABLE 1: SD 38 STUDY INTERSECTIONS

Main Line	Cross Street(s)
SD Highway 38	SD Highway 19 / 457 th Avenue
SD Highway 38	459 th Avenue
SD Highway 38	I-90 Speedway Entrance
SD Highway 38	Western Avenue / 463 rd Avenue
SD Highway 38	Main Avenue
SD Highway 38	Vandemark Avenue
SD Highway 38	2 nd Street
SD Highway 38	West Central High School Entrance
SD Highway 38	Railroad Street / 464 th Avenue
SD Highway 38	Mickelson Road/260 th Street
SD Highway 38	466 th Avenue (North)
SD Highway 38	WB I-90 Exit 390
SD Highway 38	EB I-90 Exit 390
SD Highway 38	466 th Avenue (South)
SD Highway 38	County Highway 141 / 468 th Avenue
SD Highway 38	County Highway 139 / 469 th Avenue
SD Highway 38	La Mesa Drive / 470 th Avenue
SD Highway 38	Marion Road

Existing Traffic Data

The existing traffic volume data for the SD 38 corridor was developed from 12-hour count data collected on November 2, 2022, for 17 intersections. Event traffic data for the I-90 Speedway intersection was developed from 14-hour count data collected on May 27th, 2023 at the intersection of SD 38 & the I-90 Speedway Entrance. The count data included turning movements by approach in 15-minute intervals with composition of passenger vehicles and trucks. Review of the traffic volume data revealed the peak hour periods occurred between 7:15-8:15 AM and 4:45-5:45 PM. The daily traffic data was provided by SDDOT.

Traffic Forecast Methodology

In order to evaluate the existing infrastructure under future traffic conditions, the 2050 ADT volumes were collected from the Sioux Falls Metropolitan Planning Organization (SFMPO) Travel Demand Model (TDM). These forecasted volumes account for localized traffic growth, changes in traffic patterns, and any planned roadway improvements. To determine the traffic growth within the study area and estimate 2050 peak hour volumes, the 2018 base year ADT was referenced from the TDM. Additionally, the future year ADT was acquired from available SDDOT GIS data to account for portions of SD 38 that were outside the TDM boundaries. Available development site plans were sourced and any planned development trips that had not been included in the TDM were incorporated into the future year forecasted volumes.

The growth calculated from the ADT values were used to develop 2050 design year morning (AM) and afternoon (PM) peak hour volumes at study intersections. The peak hour volumes will be used for the traffic analysis to assess the level of operations for intersections within the study area.

Additional traffic characteristics such as the heavy vehicle percentages were established during the existing year traffic forecast development. The values established under existing year traffic are anticipated to remain relatively consistent through the future year traffic condition and were used during the 2050 design year analysis.

To develop the interim year traffic conditions, straight-line growth rates between the existing year ADT volumes and the estimated 2050 ADT volumes were calculated and the interim year traffic volumes were interpolated. Interim year 2029 and 2040 traffic forecasts were developed.

The estimated interim year 2029 and 2040 morning (AM) and afternoon (PM) peak hour volumes were developed by process of interpolation using straight-line growth assumptions based on the existing year and future year 2050 traffic volumes. The peak hour volumes were used for the traffic analysis to assess the level of operations for intersections and highway segments within the study area.

Traffic Operations Methodology

Intersection level of service (LOS) is primarily a function of peak hour turning movement volumes, intersection lane configuration, and traffic control. For intersection analysis, the Highway Capacity Manual (HCM) defines LOS in terms of the average control delay at the intersection in seconds per vehicle. The results of a HCM analysis are typically presented in the form of a letter grade (A-F) that provides a qualitative estimate of the operational efficiency or effectiveness of the corridor. Much like an academic report card, LOS A represents the best range of operating conditions (i.e., motorists experiencing little delay or congestion) and LOS F represents the worst (i.e., extreme delay or severe congestion).

Table 2 defines the control delay range corresponding to each LOS for unsignalized and signalized intersection locations. At intersections, LOS E is considered to be at capacity and typically represents a scenario in which significant queuing is present or traffic signal cycle failure is evident. For unsignalized intersections, the intersection LOS is given by the worst approach LOS. For instance, an intersection with LOS D on one approach and LOS B on the rest would result in LOS D for the intersection.

TABLE 2: LEVEL OF SERVICE FOR CONTROL DELAY (INTERSECTIONS)

Level Of Service	Unsignalized	Traffic Signal
	Control Delay (sec/veh)	Control Delay (sec/veh)
A	≤ 10	≤ 10
B	> 10 and ≤ 15	> 10 and ≤ 20
C	> 15 and ≤ 25	> 20 and ≤ 35
D	> 25 and ≤ 35	> 35 and ≤ 55
E	> 35 and ≤ 50	> 55 and ≤ 80
F	> 50	> 80

Source: Highway Capacity Manual, 7th Edition.

Following SDDOT guidance, LOS C is the desired minimum traffic operational goal for intersections in rural environments while LOS D is an acceptable operational goal for intersections in dense urban environments. The intersections within the study area have a desired traffic operational goal of LOS C.

Table 3 defines the follower density range corresponding to each LOS for two-lane highway segments. On two-lane highways, LOS E is considered to be at capacity. For two-lane highway segments, a LOS B would represent a scenario where some platooning is present with the potential passing demand and passing opportunities balanced while a LOS D would represent a scenario where significant platooning is present and passing demand far exceeds passing opportunities.

TABLE 3: LEVEL OF SERVICE FOR FOLLOWER DENSITY (TWO-LANE HIGHWAYS)

Level Of Service	Speed ≥ 50 mph	Speed < 50 mph
	Follower Density (followers/mi/ln)	Follower Density (followers/mi/ln)
A	≤ 2.0	≤ 2.5
B	$> 2.0 - 4.0$	$> 2.5 - 5.0$
C	$> 4.0 - 8.0$	$> 5.0 - 10.0$
D	$> 8.0 - 12.0$	$> 10.0 - 15.0$
E	> 12.0	> 15.0
F	Demand exceeds capacity	

Source: Highway Capacity Manual, 7th Edition.

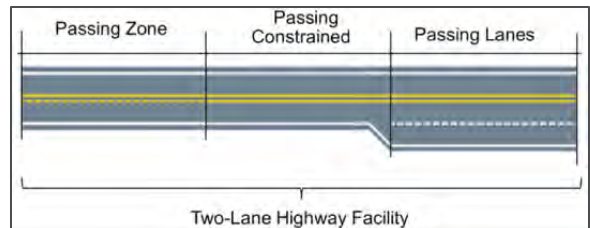
Following SDDOT guidance, LOS C is the desired traffic operational goal for highways in rural environments (functional classification of collector) and LOS D is considered the minimal acceptable operations for highways in urban environments (functional classification of minor arterial). The SD 38 highway segments within the study area are categorized as rural with federal functional classification of collector between Humboldt to Hartford and categorized as urban with federal functional classification of minor arterial between Hartford to Sioux Falls. The two-lane highway segments within the study area have a desired traffic operational goal of LOS C.

The highway was segmented according to the two-lane highway methodology presented in chapter 15 of HCM7, with segment breaks reflecting the passing zones. The segmentation for analysis can be seen in the Appendix.

The following analysis years/scenarios were evaluated for traffic operational analysis:

- Opening year 2029 No-Build.
- Interim year 2040 No-Build.
- Design year 2050 No-Build.

Operational analysis was completed for the AM and PM peak hour periods of each scenario.



Future Traffic Operations

Traffic operations analysis for the study area intersections included capacity evaluation using the Highway Capacity Manual (HCM) 7th Edition techniques thru use of the Highway Capacity Software (HCS) 2022. Output reports from the HCS2022 software are available in the Appendix.

Traffic operations analysis for the study area SD Highway 38 corridor included capacity evaluation using the Highway Capacity Manual (HCM) 7th Edition techniques through use of the Highway Capacity Software (HCS) 2022. The two-lane highway traffic operations analysis used existing highway geometry with planned improvements, future year traffic volumes and posted travel speeds. Planned improvements to the SD 38 corridor include the construction of eastbound and westbound left turn lanes at the SD 38 & 459th Avenue intersection as well as roadway widening of the SD 38 corridor between Railroad Street/ 464th Avenue to 465th Street to a three-lane cross section with center two-way left turn lane.

Output reports from the HCS2022 software are available in the Appendix.

Opening Year 2029

Opening Year 2029 traffic operations analysis used existing intersection geometry with planned improvements, future year traffic volumes and posted travel speeds. The results of the Opening Year 2029 intersection capacity analysis can be seen in **Figure 1** and **Table 4** below.

TABLE 4: HCM TRAFFIC INTERSECTION OPERATIONS – OPENING 2029

ID #	SD Hwy 38 Cross Street(s)	Intersection Control	AM PEAK HOUR		PM PEAK HOUR	
			Delay	LOS	Delay	LOS
1	SD Highway 19 / 457 th Avenue	TWSC	10.4	B	10.5	B
2	459 th Avenue	TWSC	10.4	B	11.8	B
3	I-90 Speedway Entrance	TWSC	0.0	A	0.0	A
4	Western Avenue / 463 rd Avenue	TWSC	13.5	B	16.5	C
5	Main Avenue	TWSC	12.0	B	15.2	C
6	Vandemark Avenue	TWSC	12.6	B	12.7	B
7	2 nd Street	TWSC	16.6	C	18.5	C
8	West Central High School Entrance	TWSC	12.1	B	12.0	B
9	Railroad Street / 464 th Avenue	TWSC	18.2	C	19.8	C
10	Mickelson Road / 260 th Street	TWSC	24.8	C	54.5	F
11	466 th Avenue (North)	TWSC	19.5	C	20.3	C
12	WB I-90 Exit 390	TWSC	11.5	B	17.7	C
13	EB I-90 Exit 390	TWSC	12.3	B	15.4	C
14	466 th Avenue (South)	TWSC	11.9	B	12.3	B
15	County Highway 141 / 468 th Avenue	TWSC	13.5	B	14.5	B
16	County Highway 139 / 469 th Avenue	TWSC	14.2	B	18.5	C
17	La Mesa Drive / 470 th Avenue	TWSC	17.0	C	21.7	C
18	Marion Road	Signal	16.2	B	20.6	C

Notes: Bold/Highlighted indicates a poor LOS

Under the Opening Year 2029 conditions, the traffic operations analysis showed acceptable operations at the majority of intersections within the study area, with intersections achieving LOS C or greater during both the AM and PM peak hours. The SD 38 & Mickelson Road/260th Street intersection which produced a LOS F during the PM peak hour which can be attributed to the additional development traffic demand at this intersection.

The results of the two-lane highway capacity analysis can be seen in **Table 5** and **Table 6**.

TABLE 5: HCM TRAFFIC HIGHWAY OPERATIONS – OPENING 2029, EASTBOUND SD 38

ID #	Segment Type	AM PEAK HOUR		PM PEAK HOUR	
		Density	LOS	Density	LOS
SD Highway 38 Eastbound					
EB 1	Passing Zone	0.6	A	0.2	A
EB 2	Passing Constrained	0.7	A	0.3	A
EB 3	Passing Zone	0.5	A	0.2	A
EB 4	Passing Constrained	0.7	A	0.3	A
EB 5	Passing Zone	0.5	A	0.2	A
EB 6	Passing Constrained	0.7	A	0.3	A
EB 7	Passing Zone	0.6	A	0.2	A
EB 8	Passing Zone	0.5	A	0.2	A
EB 9	Passing Constrained	0.7	A	0.3	A
EB 10	Passing Zone	0.5	A	0.2	A
EB 11	Passing Zone	0.6	A	0.3	A
EB 12	Passing Constrained	0.7	A	0.4	A
EB 13	Passing Zone	0.6	A	0.3	A
EB 14	Passing Constrained	1.3	A	0.7	A
EB 15	Passing Zone	3.7	B	1.8	A
EB 16	Passing Constrained	4.1	C	1.9	A
EB 17	Passing Zone	3.7	B	1.8	A
EB 18	Passing Zone	3.6	B	1.3	A
EB 19	Passing Constrained	3.6	B	1.3	A
EB 20	Passing Constrained	3.8	B	1.4	A
EB 21	Passing Constrained	4.0	C	1.7	A
EB 22	Passing Constrained	1.2	A	1.0	A
EB 23	Passing Constrained	1.3	A	1.0	A
EB 24	Passing Zone	1.1	A	0.9	A
EB 25	Passing Constrained	1.2	A	1.0	A
EB 26	Passing Zone	1.1	A	0.8	A
EB 27	Passing Constrained	1.3	A	1.0	A
EB 28	Passing Zone	1.1	A	0.9	A
EB 29	Passing Zone	1.5	A	1.2	A
EB 30	Passing Constrained	1.6	A	1.3	A
EB 31	Passing Zone	1.4	A	1.2	A
EB 32	Passing Constrained	1.6	A	1.3	A
EB 33	Passing Constrained	4.2	C	1.3	A
EB 34	Passing Zone	3.9	B	1.3	A
EB 35	Passing Constrained	4.0	C	1.2	A

Notes: Bold/Highlighted indicates a poor LOS

TABLE 6: HCM TRAFFIC HIGHWAY OPERATIONS – OPENING 2029, WESTBOUND SD 38

ID #	Segment Type	AM PEAK HOUR		PM PEAK HOUR	
		Density	LOS	Density	LOS
SD Highway 38 Westbound					
WB 1	Passing Constrained	0.7	A	4.4	C
WB 2	Passing Zone	0.7	A	4.2	C
WB 3	Passing Constrained	0.8	A	2.1	B
WB 4	Passing Zone	0.8	A	2.1	B
WB 5	Passing Constrained	0.7	A	2.0	A
WB 6	Passing Zone	0.8	A	2.1	B
WB 7	Passing Constrained	0.6	A	1.5	A
WB 8	Passing Constrained	0.7	A	1.7	A
WB 9	Passing Zone	0.6	A	1.4	A
WB 10	Passing Constrained	0.7	A	1.6	A
WB 11	Passing Zone	0.6	A	1.5	A
WB 12	Passing Constrained	0.7	A	1.7	A
WB 13	Passing Constrained	0.7	A	1.7	A
WB 14	Passing Constrained	0.9	A	2.1	B
WB 15	Passing Constrained	0.8	A	1.7	A
WB 16	Passing Constrained	1.5	A	5.1	C
WB 17	Passing Constrained	1.3	A	4.9	C
WB 18	Passing Constrained	1.4	A	5.1	C
WB 19	Passing Zone	1.3	A	4.8	C
WB 20	Passing Constrained	1.4	A	5.1	C
WB 21	Passing Constrained	1.9	A	5.1	C
WB 22	Passing Zone	1.7	A	4.1	C
WB 23	Passing Zone	0.3	A	0.7	A
WB 24	Passing Zone	0.3	A	0.7	A
WB 25	Passing Zone	0.3	A	0.6	A
WB 26	Passing Constrained	0.3	A	0.8	A
WB 27	Passing Zone	0.3	A	0.6	A
WB 28	Passing Constrained	0.3	A	0.8	A
WB 29	Passing Constrained	0.3	A	0.8	A
WB 30	Passing Zone	0.3	A	0.6	A
WB 31	Passing Constrained	0.3	A	0.8	A
WB 32	Passing Zone	0.3	A	0.7	A
WB 33	Passing Constrained	0.3	A	0.8	A
WB 34	Passing Zone	0.3	A	0.7	A
WB 35	Passing Constrained	0.5	A	1.0	A

Notes: Bold/Highlighted indicates a poor LOS

Under the Opening Year 2029 conditions, the traffic operations analysis showed acceptable operations at all of the highway segments within the study area, with all segments achieving LOS C or greater during both the AM and PM peak hours.

In general, the Opening Year 2029 condition traffic operations demonstrated acceptable performance measures throughout the majority of intersections and highway segments within the study area. The desired LOS was realized for all intersections and highway segments during the AM and PM peak hours with the exception of the Mickelson Road/260th Street intersection.

Interim Year 2040

Interim Year 2040 traffic operations analysis used future year traffic volumes and posted travel speeds. The SD 38 & Mickelson Road/260th Street intersection was analyzed under traffic signal control. The results of the Interim Year 2040 intersection capacity analysis can be seen in **Figure 2** and **Table 7** below.

TABLE 7: HCM TRAFFIC INTERSECTION OPERATIONS – INTERIM YEAR 2040

ID #	SD Hwy 38 Cross Street(s)	Intersection Control	AM PEAK HOUR		PM PEAK HOUR	
			Delay	LOS	Delay	LOS
1	SD Highway 19 / 457 th Avenue	TWSC	11.1	B	11.2	B
2	459 th Avenue	TWSC	10.9	B	12.4	B
3	I-90 Speedway Entrance	TWSC	0.0	A	0.0	A
4	Western Avenue / 463 rd Avenue	TWSC	15.9	C	23.2	C
5	Main Avenue	TWSC	13.1	B	19.0	C
6	Vandemark Avenue	TWSC	13.6	B	14.6	B
7	2 nd Street	TWSC	21.2	C	25.6	D
8	West Central High School Entrance	TWSC	13.5	B	13.2	B
9	Railroad Street / 464 th Avenue	TWSC	25.3	D	26.2	D
10	Mickelson Road / 260 th Street	Signal	30.1	C	29.6	C
11	466 th Avenue (North)	TWSC	24.6	C	25.0	D
12	WB I-90 Exit 390	TWSC	13.1	B	27.0	D
13	EB I-90 Exit 390	TWSC	14.4	B	21.1	C
14	466 th Avenue (South)	TWSC	12.6	B	13.6	B
15	County Highway 141 / 468 th Avenue	TWSC	14.8	B	17.2	C
16	County Highway 139 / 469 th Avenue	TWSC	21.3	C	56.2	F
17	La Mesa Drive / 470 th Avenue	TWSC	23.3	C	33.0	D
18	Marion Road	Signal	17.2	B	26.5	C

Notes: Bold/Highlighted indicates a poor LOS

Under the Interim Year 2040 conditions, the traffic operations analysis showed acceptable operations at the majority of intersections within the study area, with intersections achieving LOS C or greater during both the AM and PM peak hours. The six study intersections of SD 38 & 2nd Street, SD 38 & Railroad Street/464th Avenue, SD 38 & 466th Avenue (North), SD 38 & WB I-90, SD 38 & County Highway 139/469th Avenue, and SD 38 & La Mesa Drive/470th Avenue all produced a LOS D during at least one peak hour which does not meet the LOS goal established by the SDDOT.

The results of the two-lane highway capacity analysis can be seen in **Table 8** and **Table 9**.

TABLE 8: HCM TRAFFIC HIGHWAY OPERATIONS – INTERIM YEAR 2040, EASTBOUND SD 38

ID #	Segment Type	AM PEAK HOUR		PM PEAK HOUR	
		Density	LOS	Density	LOS
SD Highway 38 Eastbound					
EB 1	Passing Zone	0.8	A	0.4	A
EB 2	Passing Constrained	0.9	A	0.4	A
EB 3	Passing Zone	0.8	A	0.4	A
EB 4	Passing Constrained	0.9	A	0.4	A
EB 5	Passing Zone	0.8	A	0.4	A
EB 6	Passing Constrained	0.9	A	0.4	A
EB 7	Passing Zone	0.8	A	0.4	A
EB 8	Passing Zone	0.8	A	0.3	A
EB 9	Passing Constrained	1.0	A	0.5	A
EB 10	Passing Zone	0.8	A	0.4	A
EB 11	Passing Zone	0.8	A	0.4	A
EB 12	Passing Constrained	1.0	A	0.5	A
EB 13	Passing Zone	0.8	A	0.4	A
EB 14	Passing Constrained	1.6	A	0.8	A
EB 15	Passing Zone	4.9	C	2.4	B
EB 16	Passing Constrained	5.3	C	2.6	B
EB 17	Passing Zone	4.9	C	2.4	B
EB 18	Passing Zone	5.2	C	2.1	B
EB 19	Passing Constrained	5.1	C	2.0	A
EB 20	Passing Constrained	5.4	C	2.2	B
EB 21	Passing Constrained	5.8	C	2.6	B
EB 22	Passing Constrained	1.8	A	1.7	A
EB 23	Passing Constrained	1.7	A	1.3	A
EB 24	Passing Zone	1.5	A	1.2	A
EB 25	Passing Constrained	1.7	A	1.3	A
EB 26	Passing Zone	1.5	A	1.2	A
EB 27	Passing Constrained	1.7	A	1.3	A
EB 28	Passing Zone	1.6	A	1.3	A
EB 29	Passing Zone	2.1	B	1.9	A
EB 30	Passing Constrained	2.3	B	1.9	A
EB 31	Passing Zone	2.0	A	1.8	A
EB 32	Passing Constrained	2.3	B	1.9	A
EB 33	Passing Constrained	5.6	C	1.9	A
EB 34	Passing Zone	5.3	C	1.8	A
EB 35	Passing Constrained	5.4	C	1.8	A

Notes: Bold/Highlighted indicates a poor LOS

TABLE 9: HCM TRAFFIC HIGHWAY OPERATIONS – INTERIM YEAR 2040, WESTBOUND SD 38

ID #	Segment Type	AM PEAK HOUR		PM PEAK HOUR	
		Density	LOS	Density	LOS
SD Highway 38 Westbound					
WB 1	Passing Constrained	1.0	A	6.0	C
WB 2	Passing Zone	1.0	A	5.8	C
WB 3	Passing Constrained	1.2	A	2.9	B
WB 4	Passing Zone	1.2	A	3.0	B
WB 5	Passing Constrained	1.1	A	2.8	B
WB 6	Passing Zone	1.2	A	3.0	B
WB 7	Passing Constrained	0.9	A	2.0	A
WB 8	Passing Constrained	1.0	A	2.2	B
WB 9	Passing Zone	0.8	A	1.9	A
WB 10	Passing Constrained	1.0	A	2.2	B
WB 11	Passing Zone	0.9	A	2.0	A
WB 12	Passing Constrained	1.0	A	2.2	B
WB 13	Passing Constrained	1.0	A	2.2	B
WB 14	Passing Constrained	1.4	A	3.2	B
WB 15	Passing Constrained	1.1	A	2.6	B
WB 16	Passing Constrained	2.1	B	7.2	C
WB 17	Passing Constrained	1.9	A	6.8	C
WB 18	Passing Constrained	2.0	A	7.1	C
WB 19	Passing Zone	1.9	A	6.9	C
WB 20	Passing Constrained	2.0	A	7.1	C
WB 21	Passing Constrained	2.4	B	6.5	C
WB 22	Passing Zone	2.2	B	5.4	C
WB 23	Passing Zone	0.4	A	1.0	A
WB 24	Passing Zone	0.4	A	1.0	A
WB 25	Passing Zone	0.4	A	0.9	A
WB 26	Passing Constrained	0.5	A	1.2	A
WB 27	Passing Zone	0.4	A	1.0	A
WB 28	Passing Constrained	0.5	A	1.2	A
WB 29	Passing Constrained	0.5	A	1.1	A
WB 30	Passing Zone	0.4	A	0.9	A
WB 31	Passing Constrained	0.5	A	1.1	A
WB 32	Passing Zone	0.5	A	1.0	A
WB 33	Passing Constrained	0.5	A	1.1	A
WB 34	Passing Zone	0.5	A	1.0	A
WB 35	Passing Constrained	0.7	A	1.5	A

Notes: Bold/Highlighted indicates a poor LOS

Under the Interim Year 2040 conditions, the traffic operations analysis showed acceptable operations at all of the highway segments within the study area, with segments achieving LOS C or greater during both the AM and PM peak hours.

In general, the Interim Year 2040 condition traffic operations demonstrated acceptable performance measures throughout the majority of intersections and highway segments within the study area. The desired LOS was realized for the majority of intersections and highway segments during the AM and PM peak hours with the exception of five study intersections that had LOS D.

Design Year 2050

Design Year 2050 traffic operations analysis used future year traffic volumes and posted travel speeds. The SD 38 & Mickelson Road/260th Street intersection was analyzed under traffic signal control. The results of the Design Year 2050 intersection capacity analysis can be seen in **Figure 3** and **Table 10** below.

TABLE 10: HCM TRAFFIC INTERSECTION OPERATIONS – DESIGN YEAR 2050

ID #	SD Hwy 38 Cross Street(s)	Intersection Control	AM PEAK HOUR		PM PEAK HOUR	
			Delay	LOS	Delay	LOS
1	SD Highway 19 / 457 th Avenue	TWSC	12.2	B	12.3	B
2	459 th Avenue	TWSC	11.6	B	13.5	B
3	I-90 Speedway Entrance	TWSC	0.0	A	0.0	A
4	Western Avenue / 463 rd Avenue	TWSC	21.5	C	56.5	F
5	Main Avenue	TWSC	14.4	B	25.5	D
6	Vandemark Avenue	TWSC	15.4	C	16.8	C
7	2 nd Street	TWSC	31.1	C	38.3	E
8	West Central High School Entrance	TWSC	15.4	C	14.8	B
9	Railroad Street / 464 th Avenue	TWSC	41.4	E	42.7	E
10	Mickelson Road / 260 th Street	Signal	19.2	B	21.3	C
11	466 th Avenue (North)	TWSC	31.6	D	31.4	D
12	WB I-90 Exit 390	TWSC	14.9	B	66.1	F
13	EB I-90 Exit 390	TWSC	18.4	C	30.0	D
14	466 th Avenue (South)	TWSC	13.9	B	15.7	C
15	County Highway 141 / 468 th Avenue	TWSC	16.7	C	21.3	C
16	County Highway 139 / 469 th Avenue	TWSC	42.5	E	259.5	F
17	La Mesa Drive / 470 th Avenue	TWSC	39.2	E	81.5	F
18	Marion Road	Signal	19.1	B	32.1	C

Notes: Bold/Highlighted indicates a poor LOS

Under the Design Year 2050 conditions, the traffic operations analysis showed potential capacity constraints and inefficiencies at many intersections within the study area. The nine study intersections of SD 38 & Western Avenue/463rd Avenue, SD 38 & Main Avenue, SD 38 & 2nd Street, SD 38 & Railroad Street/464th Avenue, SD 38 & 466th Avenue (North), SD 38 & WB I-90, SD 38 & EB I-90, SD 38 & County Highway 139/469th Avenue, and SD 38 & La Mesa Drive/470th Avenue all produced a LOS D or worse during at least one peak hour which does not meet the LOS goal established by the SDDOT.

The results of the two-lane highway capacity analysis can be seen in **Table 11** and **Table 12**.

TABLE 11: HCM TRAFFIC HIGHWAY OPERATIONS – DESIGN YEAR 2050, EASTBOUND SD 38

ID #	Segment Type	AM PEAK HOUR		PM PEAK HOUR	
		Density	LOS	Density	LOS
SD Highway 38 Eastbound					
EB 1	Passing Zone	1.2	A	0.6	A
EB 2	Passing Constrained	1.3	A	0.6	A
EB 3	Passing Zone	1.1	A	0.5	A
EB 4	Passing Constrained	1.3	A	0.6	A
EB 5	Passing Zone	1.1	A	0.5	A
EB 6	Passing Constrained	1.3	A	0.6	A
EB 7	Passing Zone	1.2	A	0.6	A
EB 8	Passing Zone	1.1	A	0.6	A
EB 9	Passing Constrained	1.3	A	0.7	A
EB 10	Passing Zone	1.1	A	0.5	A
EB 11	Passing Zone	1.1	A	0.5	A
EB 12	Passing Constrained	1.3	A	0.7	A
EB 13	Passing Zone	1.1	A	0.5	A
EB 14	Passing Constrained	2.1	B	1.1	A
EB 15	Passing Zone	6.7	C	3.4	B
EB 16	Passing Constrained	7.1	C	3.5	B
EB 17	Passing Zone	6.7	C	3.4	B
EB 18	Passing Zone	8.1	D	3.3	B
EB 19	Passing Constrained	7.9	C	3.1	B
EB 20	Passing Constrained	8.3	D	3.4	B
EB 21	Passing Constrained	9.2	D	4.2	C
EB 22	Passing Constrained	3.2	B	2.9	B
EB 23	Passing Constrained	2.4	B	1.9	A
EB 24	Passing Zone	2.2	B	1.8	A
EB 25	Passing Constrained	2.3	B	1.9	A
EB 26	Passing Zone	2.1	B	1.7	A
EB 27	Passing Constrained	2.4	B	1.9	A
EB 28	Passing Zone	2.2	B	1.8	A
EB 29	Passing Zone	3.3	B	2.8	B
EB 30	Passing Constrained	3.5	B	2.9	B
EB 31	Passing Zone	3.2	B	2.8	B
EB 32	Passing Constrained	3.5	B	2.9	B
EB 33	Passing Constrained	8.2	D	2.9	B
EB 34	Passing Zone	8.0	C	2.8	B
EB 35	Passing Constrained	8.0	C	2.7	B

Notes: Bold/Highlighted indicates a poor LOS

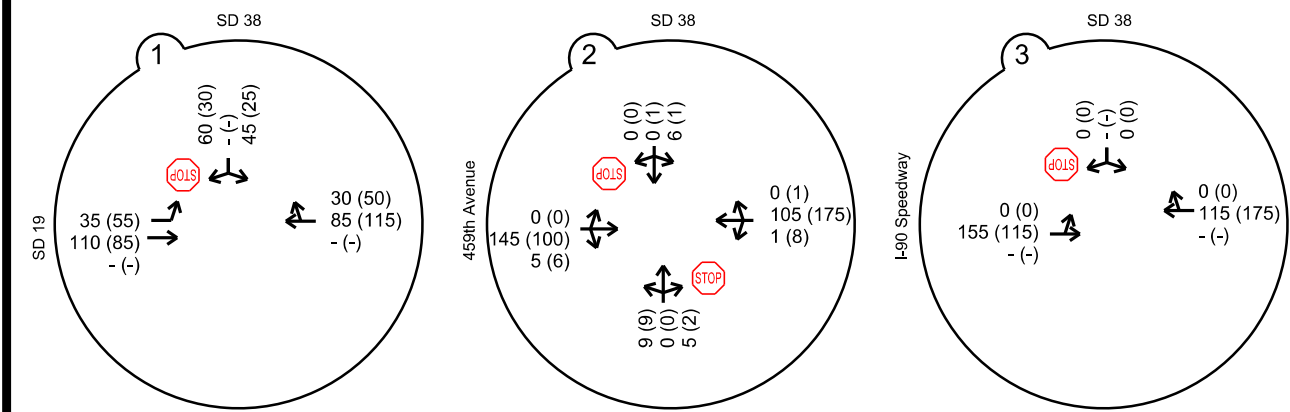
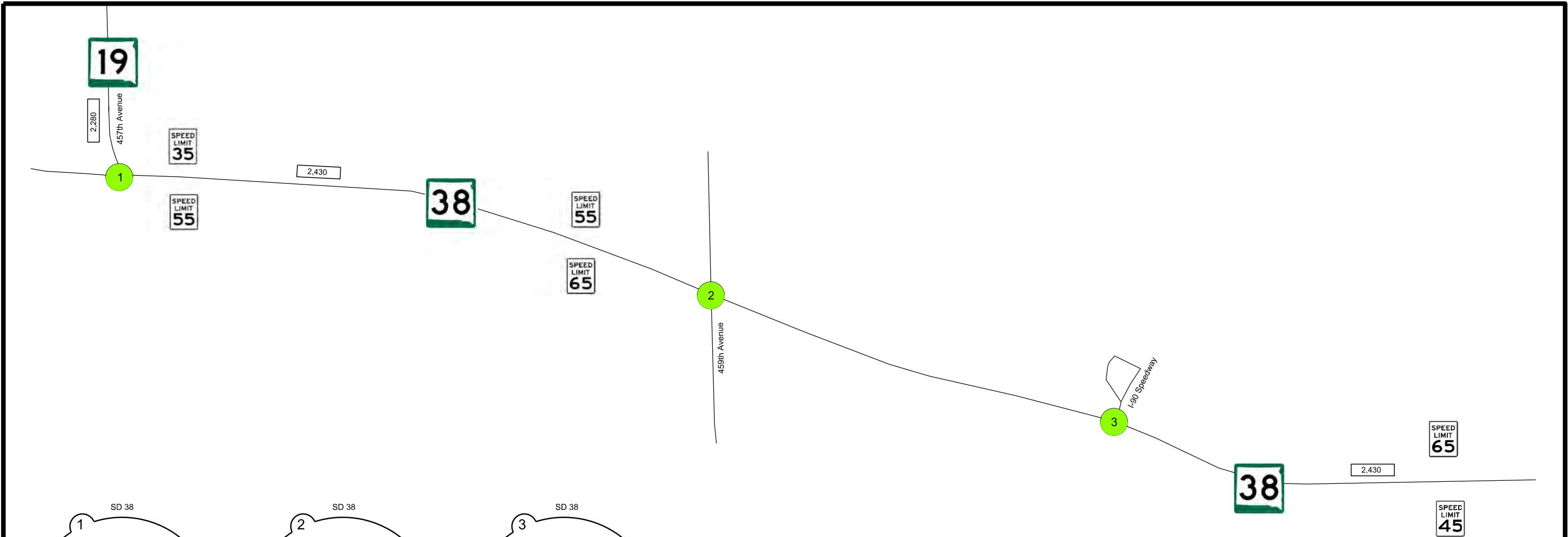
TABLE 12: HCM TRAFFIC HIGHWAY OPERATIONS – DESIGN YEAR 2050, WESTBOUND SD 38

ID #	Segment Type	AM PEAK HOUR		PM PEAK HOUR	
		Density	LOS	Density	LOS
SD Highway 38 Westbound					
WB 1	Passing Constrained	1.6	A	8.7	D
WB 2	Passing Zone	1.5	A	8.5	D
WB 3	Passing Constrained	1.8	A	4.4	C
WB 4	Passing Zone	1.8	A	4.4	C
WB 5	Passing Constrained	1.7	A	4.2	C
WB 6	Passing Zone	1.8	A	4.4	C
WB 7	Passing Constrained	1.3	A	2.9	B
WB 8	Passing Constrained	1.4	A	3.2	B
WB 9	Passing Zone	1.3	A	2.8	B
WB 10	Passing Constrained	1.4	A	3.1	B
WB 11	Passing Zone	1.3	A	2.9	B
WB 12	Passing Constrained	1.4	A	3.2	B
WB 13	Passing Constrained	1.4	A	3.2	B
WB 14	Passing Constrained	2.4	B	5.4	C
WB 15	Passing Constrained	1.9	A	4.3	C
WB 16	Passing Constrained	3.3	B	10.9	D
WB 17	Passing Constrained	3.0	B	10.5	D
WB 18	Passing Constrained	3.2	B	10.8	D
WB 19	Passing Zone	3.1	B	10.7	D
WB 20	Passing Constrained	3.2	B	10.8	D
WB 21	Passing Constrained	3.3	B	8.7	D
WB 22	Passing Zone	3.1	B	7.4	C
WB 23	Passing Zone	0.6	A	1.4	A
WB 24	Passing Zone	0.6	A	1.4	A
WB 25	Passing Zone	0.6	A	1.4	A
WB 26	Passing Constrained	0.7	A	1.7	A
WB 27	Passing Zone	0.6	A	1.4	A
WB 28	Passing Constrained	0.7	A	1.7	A
WB 29	Passing Constrained	0.7	A	1.7	A
WB 30	Passing Zone	0.6	A	1.4	A
WB 31	Passing Constrained	0.7	A	1.7	A
WB 32	Passing Zone	0.6	A	1.5	A
WB 33	Passing Constrained	0.7	A	1.7	A
WB 34	Passing Zone	0.6	A	1.5	A
WB 35	Passing Constrained	0.9	A	2.1	B

Notes: Bold/Highlighted indicates a poor LOS

Under the Design Year 2050 conditions, the traffic operations analysis showed potential capacity constraints at some segments within the study area. There were four eastbound segments and eight westbound segments that resulted in LOS D during at least one of the peak hours. The segments represent areas of focus for potential capacity improvements.

Overall, the Design Year 2050 condition traffic operations demonstrated the areas within the study limits that could benefit most from potential improvements. The desired LOS was realized for the majority of intersections and highway segments during the AM and PM peak hours but there were notable exceptions that did not meet the LOS criteria goals. The recognition of issues at these locations will be used to guide future concepts.



INTERSECTION PEAK HOUR OPERATIONS				HCM 7TH EDITION LEVEL OF SERVICE	
ID	INTERSECTIONS	CONTROL TYPE		AM	PM
		SIGNAL	STOP		
1	SD Highway 38 & SD Highway 19 / 457th Ave		X	B	B
2	SD Highway 38 & 459th Ave		X	B	B
3	SD Highway 38 & I-90 Speedway		X	A	A

NOTES: TWO-WAY STOP CONTROL LOS REPRESENTATIVE OF WORST CASE STOP CONTROLLED APPROACH.
* DENOTES V/C RATIO > 1

LEGEND

xx , xxx

xxx (xxx)

AM

PM

2029 AVERAGE DAILY TRAFFIC VOLUME (ADT)

AM (PM) PEAK HOUR VOLUME

INTERSECTION LEVEL OF SERVICE

A

B

C

D

E

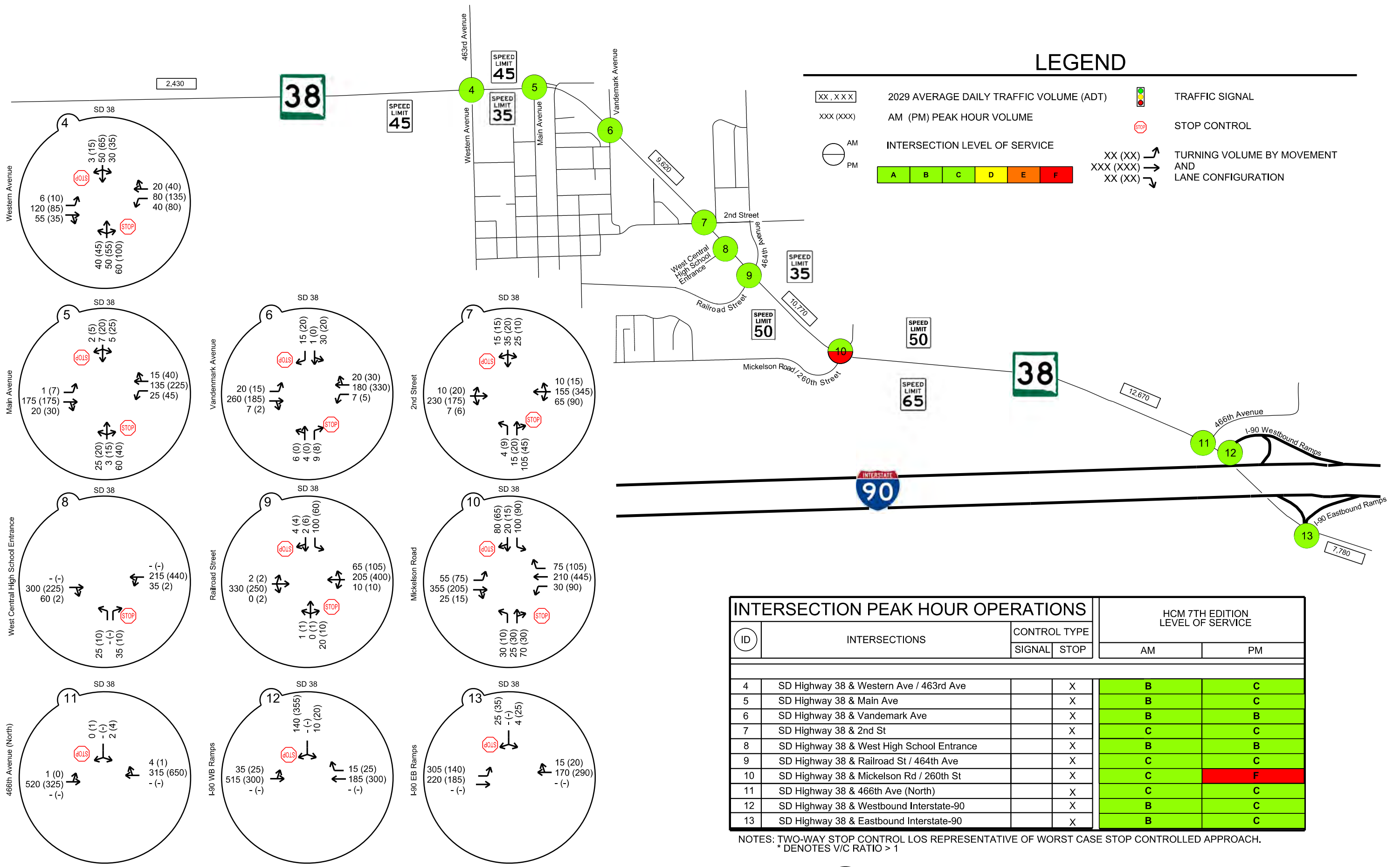
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TRAFFIC SIGNAL

STOP CONTROL

TURNING VOLUME BY MOVEMENT AND LANE CONFIGURATION



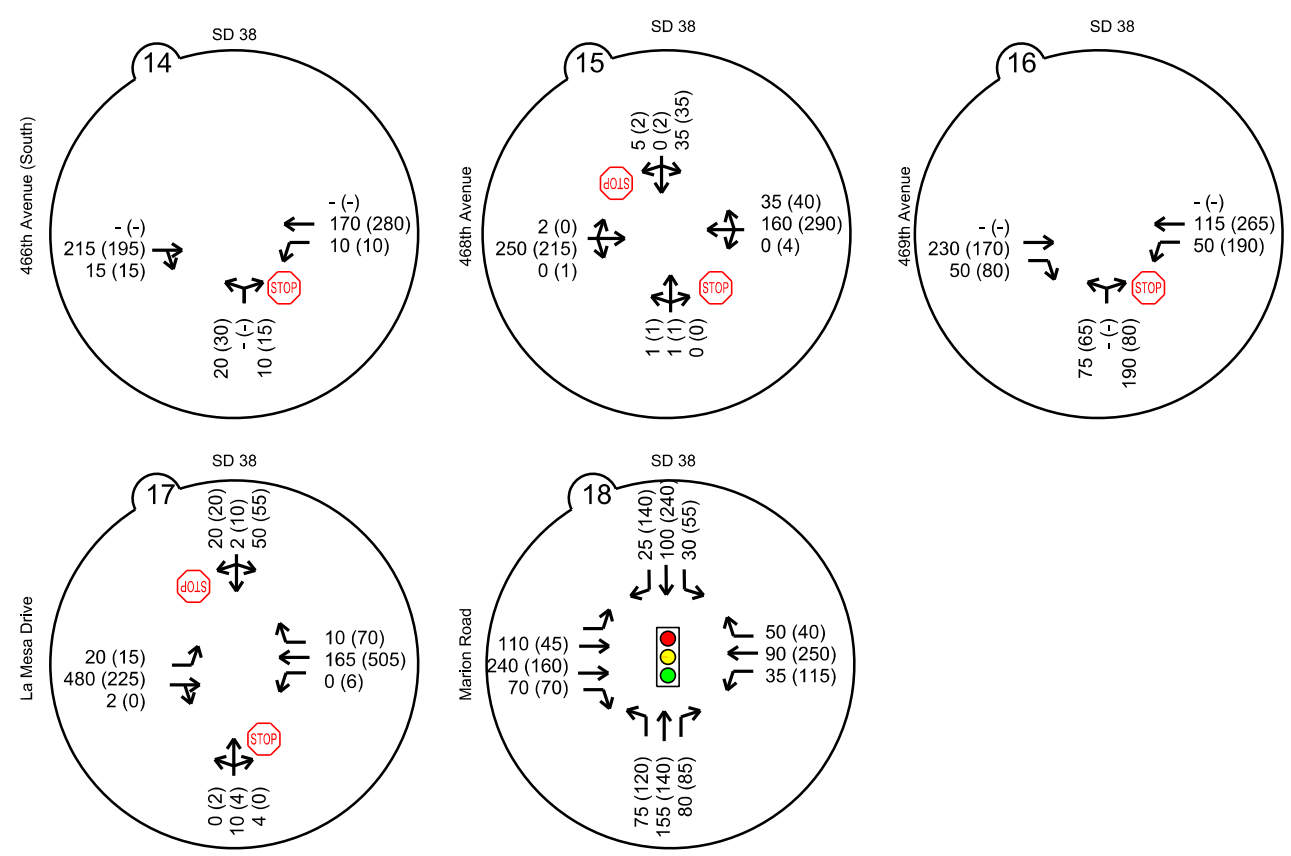
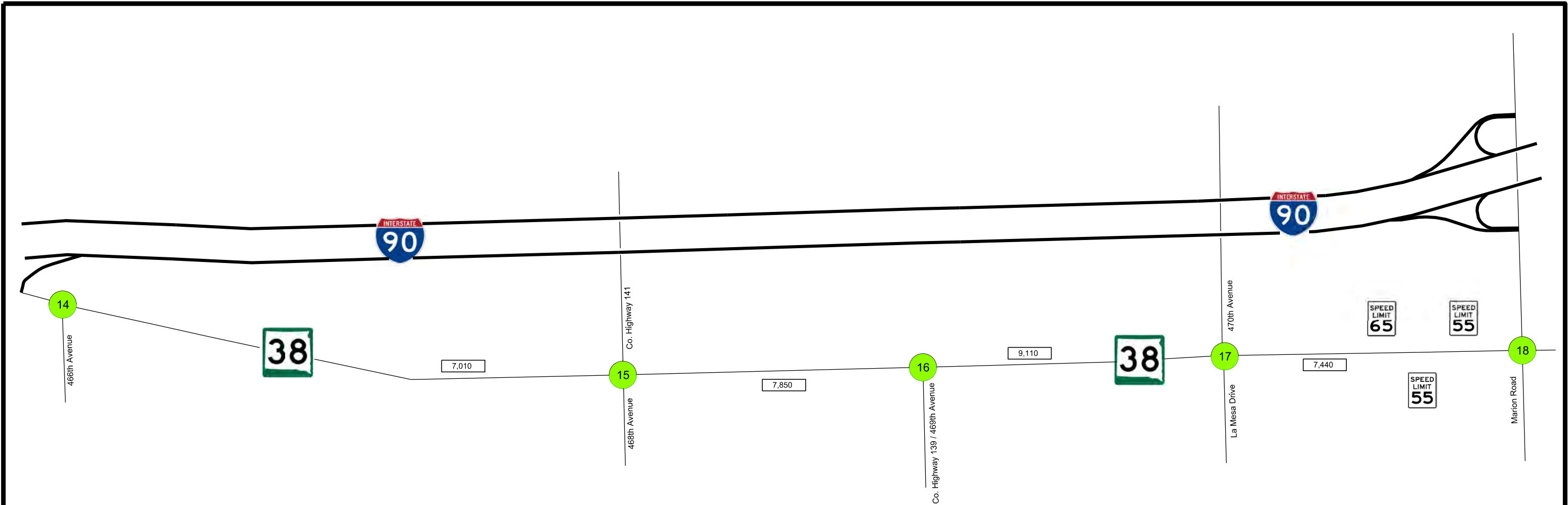


INTERSECTION PEAK HOUR OPERATIONS

ID	INTERSECTIONS	CONTROL TYPE		HCM 7TH EDITION LEVEL OF SERVICE	
		SIGNAL	STOP	AM	PM
4	SD Highway 38 & Western Ave / 463rd Ave		X	B	C
5	SD Highway 38 & Main Ave		X	B	C
6	SD Highway 38 & Vandemark Ave		X	B	B
7	SD Highway 38 & 2nd St		X	C	C
8	SD Highway 38 & West High School Entrance		X	B	B
9	SD Highway 38 & Railroad St / 464th Ave		X	C	C
10	SD Highway 38 & Mickelson Rd / 260th St		X	C	F
11	SD Highway 38 & 466th Ave (North)		X	C	C
12	SD Highway 38 & Westbound Interstate-90		X	B	C
13	SD Highway 38 & Eastbound Interstate-90		X	B	C

NOTES: TWO-WAY STOP CONTROL LOS REPRESENTATIVE OF WORST CASE STOP CONTROLLED APPROACH.
* DENOTES V/C RATIO > 1





INTERSECTION PEAK HOUR OPERATIONS				HCM 7TH EDITION LEVEL OF SERVICE	
ID	INTERSECTIONS	CONTROL TYPE		AM	PM
		SIGNAL	STOP		
14	SD Highway 38 & 466th Ave (South)		X	B	B
15	SD Highway 38 & Co. Hwy 141 / 468th Ave		X	B	B
16	SD Highway 38 & Co. Hwy 139 / 469th Ave		X	B	C
17	SD Highway 38 & La Mesa Drive / 470th Ave		X	C	C
18	SD Highway 38 & Marion Drive	X		B	C

NOTES: TWO-WAY STOP CONTROL LOS REPRESENTATIVE OF WORST CASE STOP CONTROLLED APPROACH.
* DENOTES V/C RATIO > 1

LEGEND

XX, XXX

2029 AVERAGE DAILY TRAFFIC VOLUME (ADT)

xxx (xxx)

AM (PM) PEAK HOUR VOLUME

AM

PM

INTERSECTION LEVEL OF SERVICE

A

B

C

D

E

F

TRAFFIC SIGNAL

STOP CONTROL

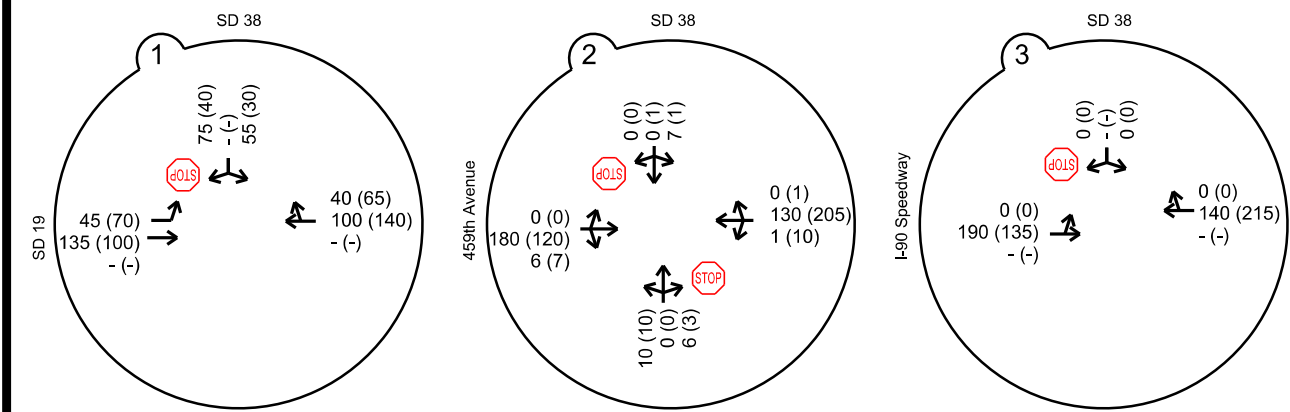
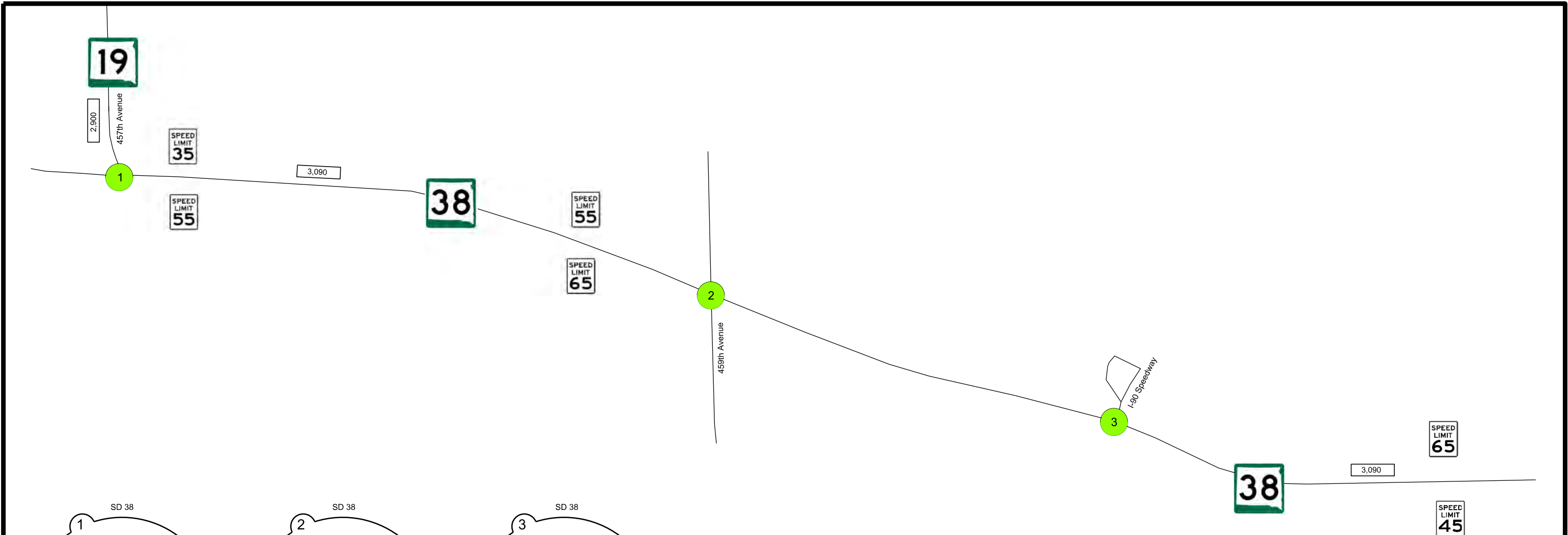
XX (XX)

XXX (XXX)

XX (XX)

TURNING VOLUME BY MOVEMENT AND LANE CONFIGURATION





INTERSECTION PEAK HOUR OPERATIONS				HCM 7TH EDITION LEVEL OF SERVICE	
ID	INTERSECTIONS	CONTROL TYPE		AM	PM
		SIGNAL	STOP		
1	SD Highway 38 & SD Highway 19 / 457th Ave		X	B	B
2	SD Highway 38 & 459th Ave		X	B	B
3	SD Highway 38 & I-90 Speedway		X	A	A

NOTES: TWO-WAY STOP CONTROL LOS REPRESENTATIVE OF WORST CASE STOP CONTROLLED APPROACH.
* DENOTES V/C RATIO > 1

LEGEND

xx,xxx

2040 AVERAGE DAILY TRAFFIC VOLUME (ADT)

xxx (xxx)

AM (PM) PEAK HOUR VOLUME

AM

PM

INTERSECTION LEVEL OF SERVICE

A

B

C

D

E

F

TRAFFIC SIGNAL

STOP

STOP CONTROL

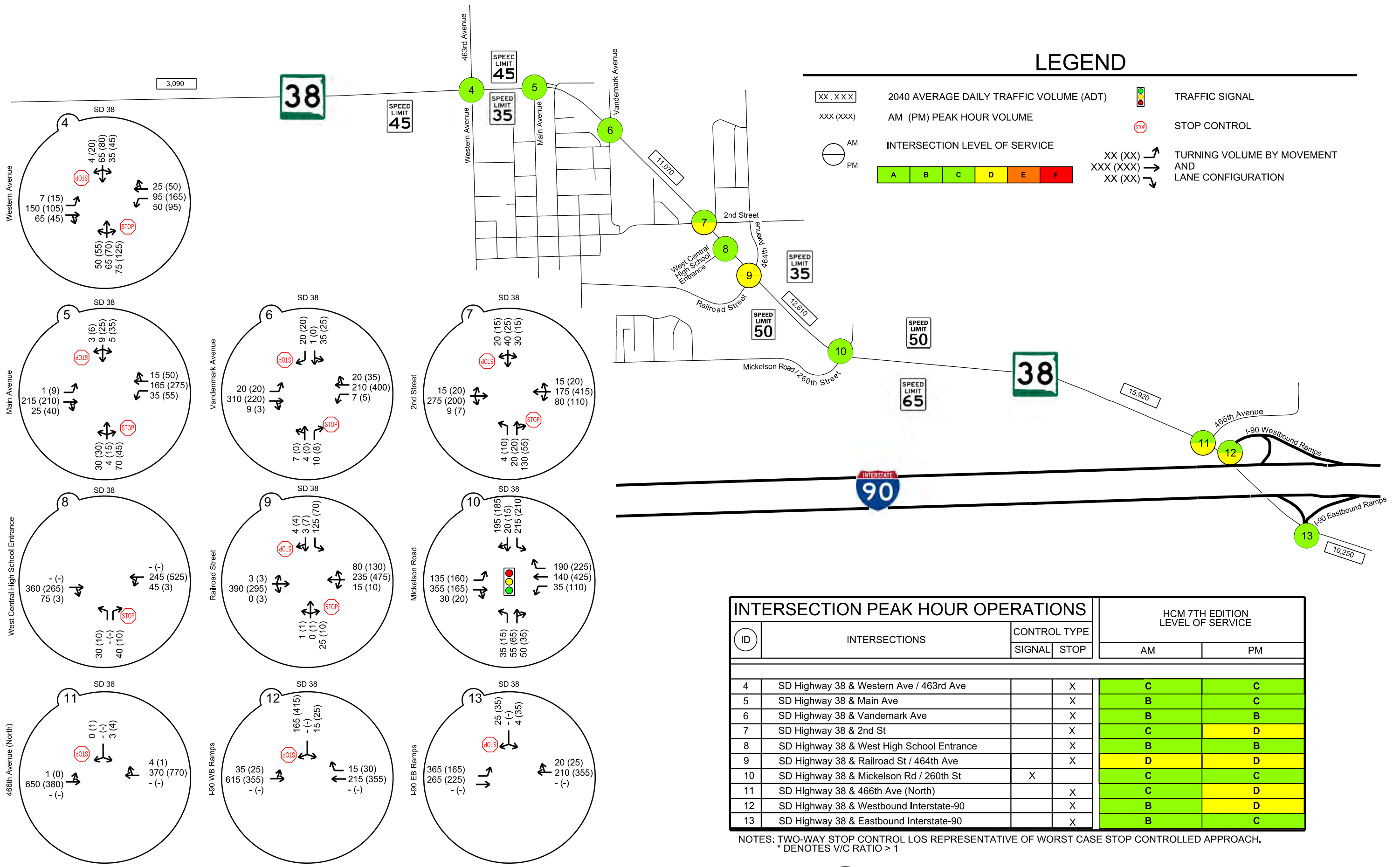
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TURNING VOLUME BY MOVEMENT
AND
LANE CONFIGURATION



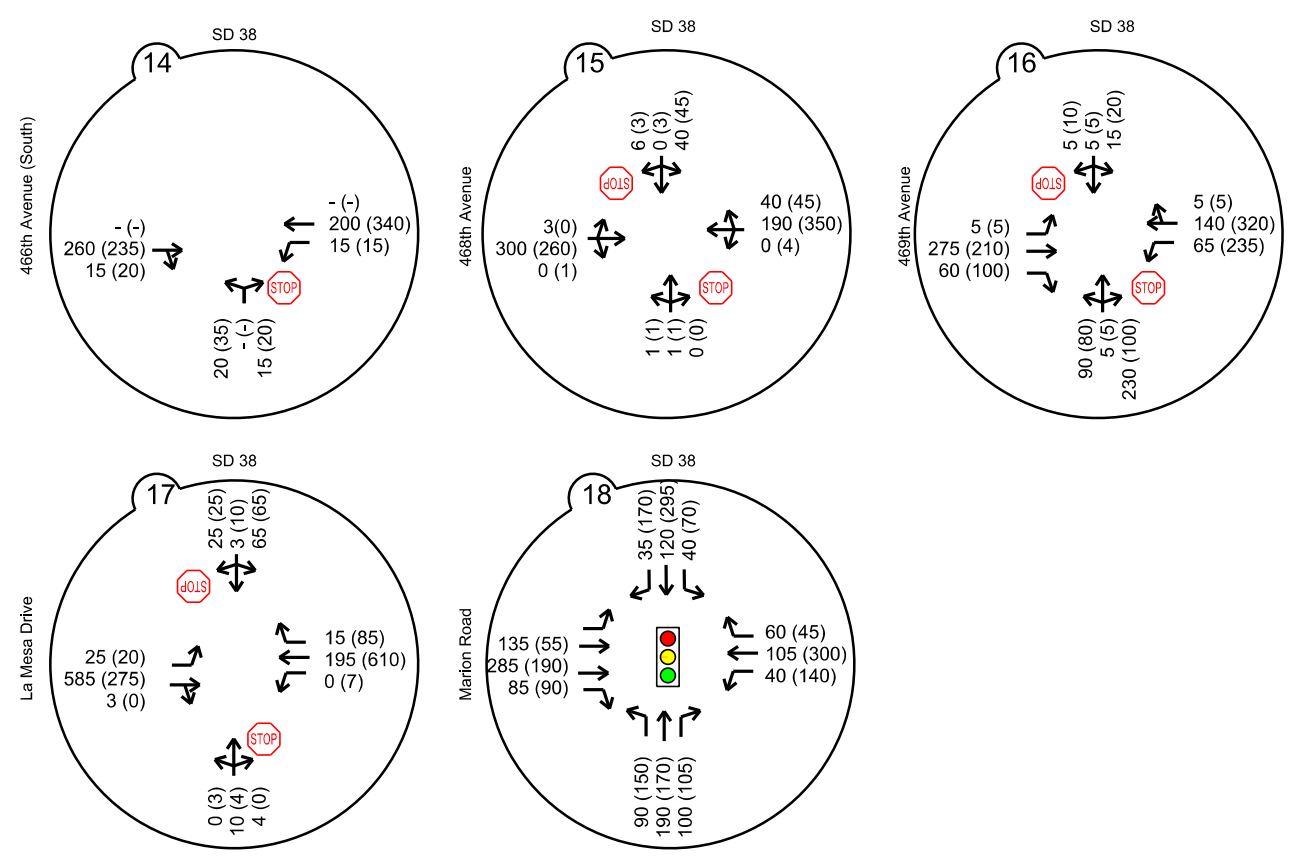
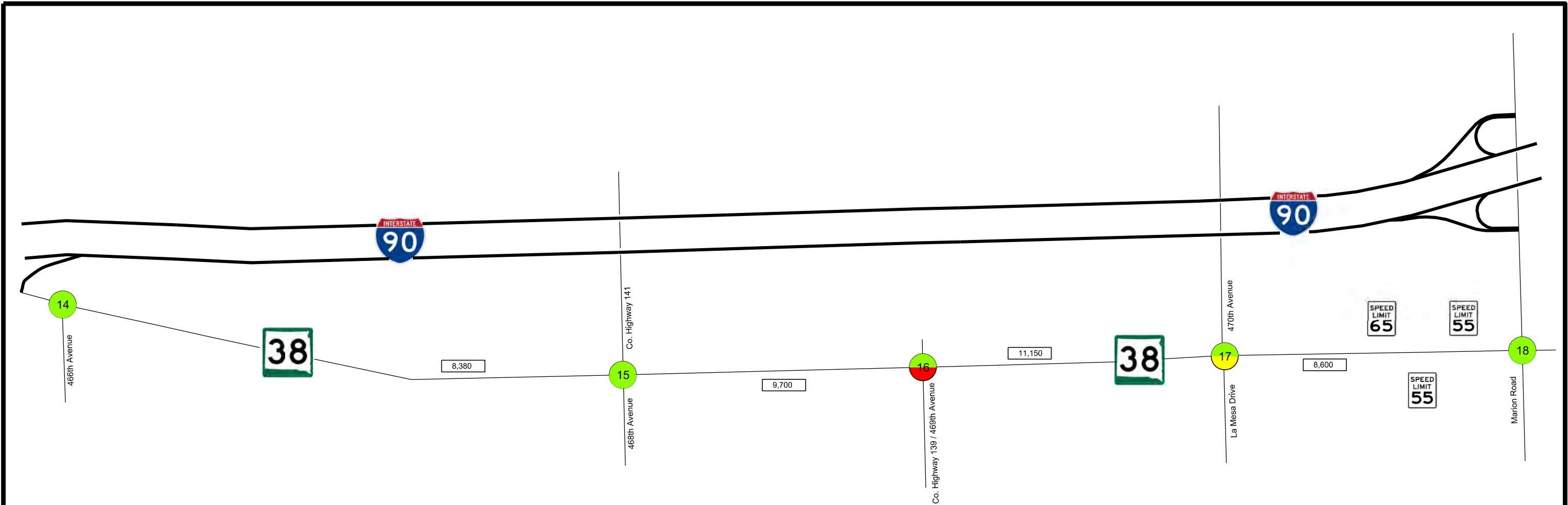


INTERSECTION PEAK HOUR OPERATIONS

ID	INTERSECTIONS	CONTROL TYPE		HCM 7TH EDITION LEVEL OF SERVICE	
		SIGNAL	STOP	AM	PM
4	SD Highway 38 & Western Ave / 463rd Ave		X	C	C
5	SD Highway 38 & Main Ave		X	B	C
6	SD Highway 38 & Vandemark Ave		X	B	B
7	SD Highway 38 & 2nd St		X	C	D
8	SD Highway 38 & West High School Entrance		X	B	B
9	SD Highway 38 & Railroad St / 464th Ave		X	D	D
10	SD Highway 38 & Mickelson Rd / 260th St	X		C	C
11	SD Highway 38 & 466th Ave (North)		X	C	D
12	SD Highway 38 & Westbound Interstate-90		X	B	D
13	SD Highway 38 & Eastbound Interstate-90		X	B	C

NOTES: TWO-WAY STOP CONTROL LOS REPRESENTATIVE OF WORST CASE STOP CONTROLLED APPROACH.
* DENOTES V/C RATIO > 1





INTERSECTION PEAK HOUR OPERATIONS				HCM 7TH EDITION LEVEL OF SERVICE	
ID	INTERSECTIONS	CONTROL TYPE		AM	PM
		SIGNAL	STOP		
14	SD Highway 38 & 466th Ave (South)		X	B	B
15	SD Highway 38 & Co. Hwy 141 / 468th Ave		X	B	C
16	SD Highway 38 & Co. Hwy 139 / 469th Ave		X	C	F
17	SD Highway 38 & La Mesa Drive / 470th Ave		X	C	D
18	SD Highway 38 & Marion Drive	X		B	C

NOTES: TWO-WAY STOP CONTROL LOS REPRESENTATIVE OF WORST CASE STOP CONTROLLED APPROACH.
* DENOTES V/C RATIO > 1

LEGEND

XX,XXX

2040 AVERAGE DAILY TRAFFIC VOLUME (ADT)

xxx (xxx)

AM (PM) PEAK HOUR VOLUME

AM

PM

INTERSECTION LEVEL OF SERVICE

A

B

C

D

E

F

TRAFFIC SIGNAL

STOP

STOP CONTROL

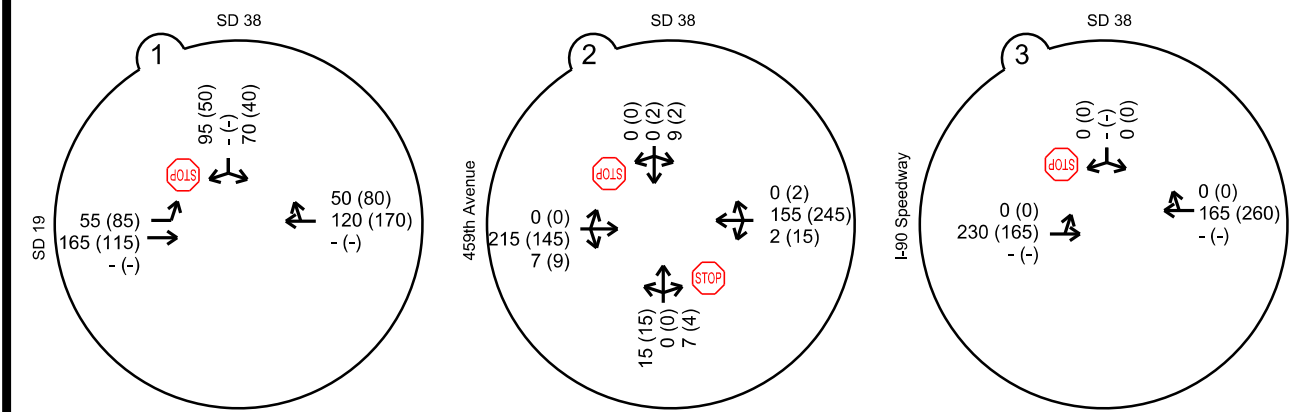
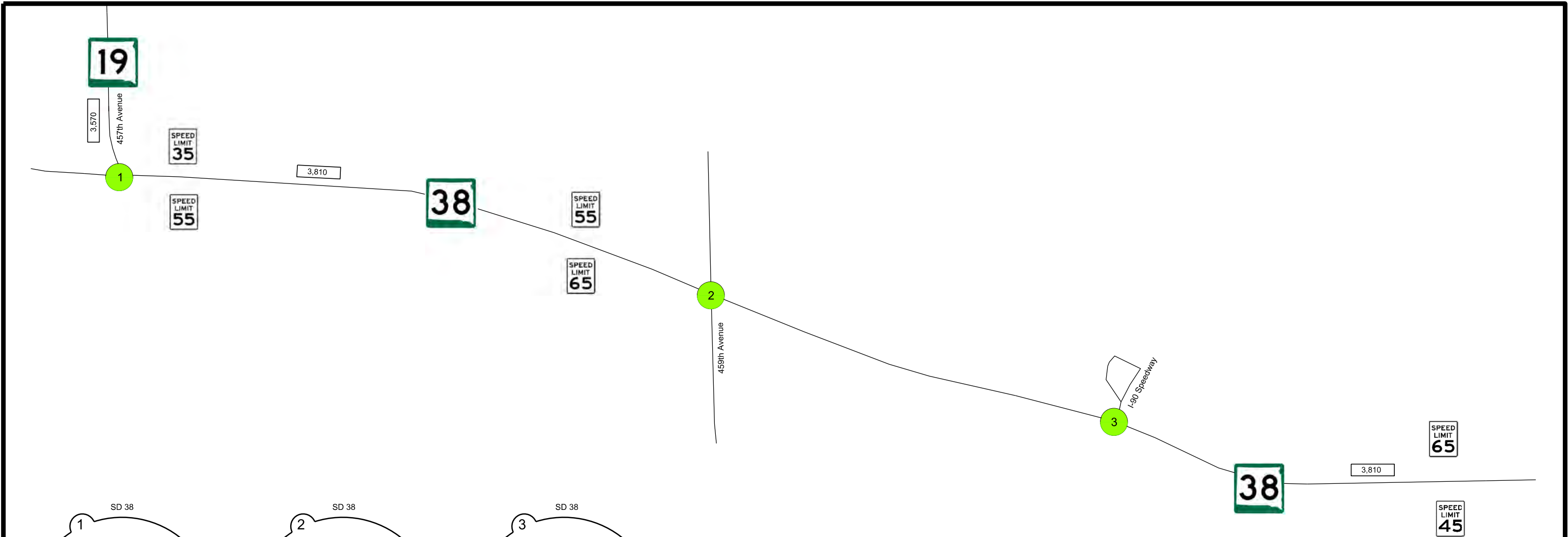
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TURNING VOLUME BY MOVEMENT
AND
LANE CONFIGURATION





INTERSECTION PEAK HOUR OPERATIONS				HCM 7TH EDITION LEVEL OF SERVICE	
ID	INTERSECTIONS	CONTROL TYPE		AM	PM
		SIGNAL	STOP		
1	SD Highway 38 & SD Highway 19 / 457th Ave		X	B	B
2	SD Highway 38 & 459th Ave		X	B	B
3	SD Highway 38 & I-90 Speedway		X	A	A

NOTES: TWO-WAY STOP CONTROL LOS REPRESENTATIVE OF WORST CASE STOP CONTROLLED APPROACH.
* DENOTES V/C RATIO > 1

LEGEND

xx,xxx

2050 AVERAGE DAILY TRAFFIC VOLUME (ADT)

xxx (xxx)

AM (PM) PEAK HOUR VOLUME

AM

PM

INTERSECTION LEVEL OF SERVICE

A

B

C

D

E

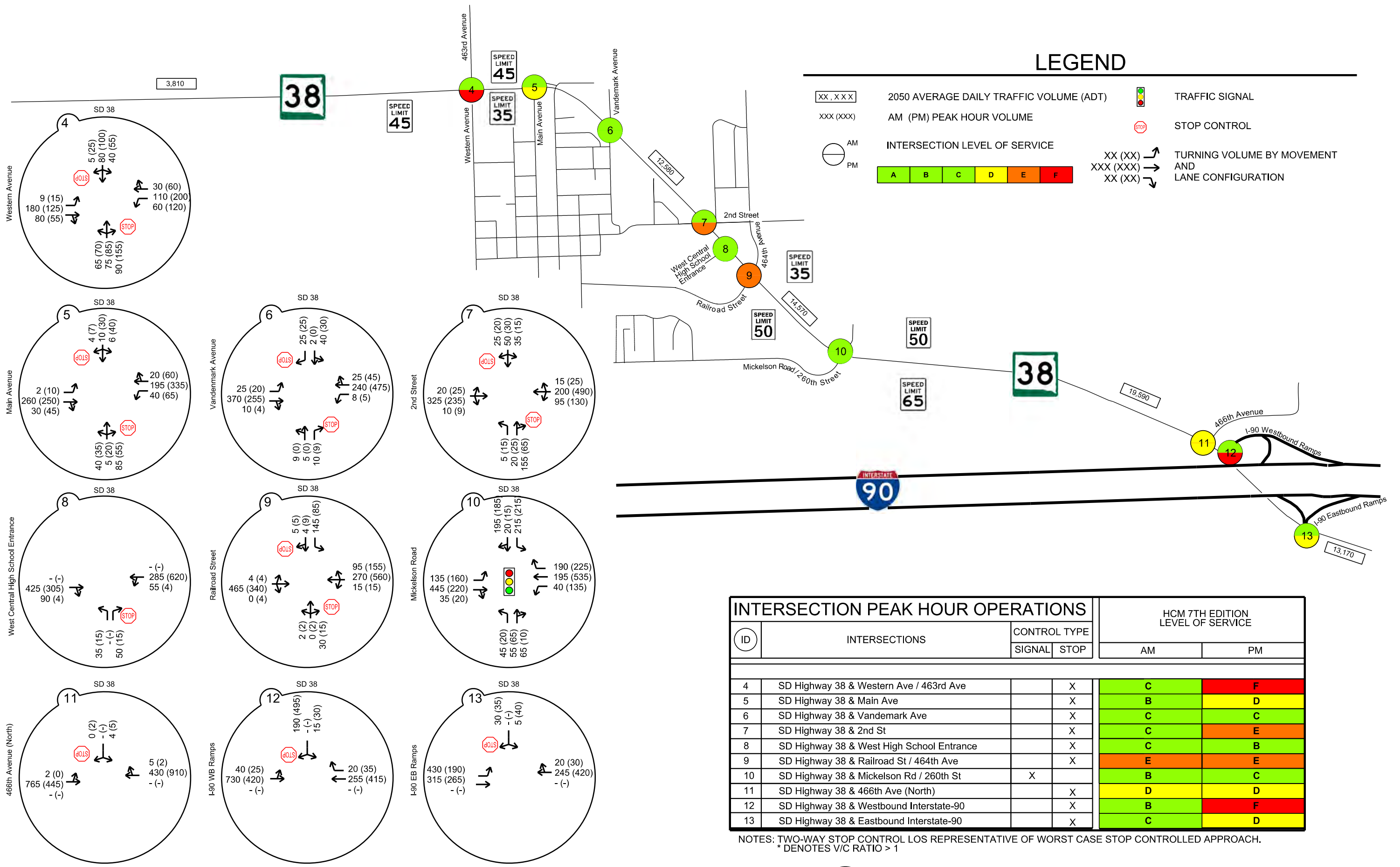
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TRAFFIC SIGNAL

STOP CONTROL

TURNING VOLUME BY MOVEMENT AND LANE CONFIGURATION



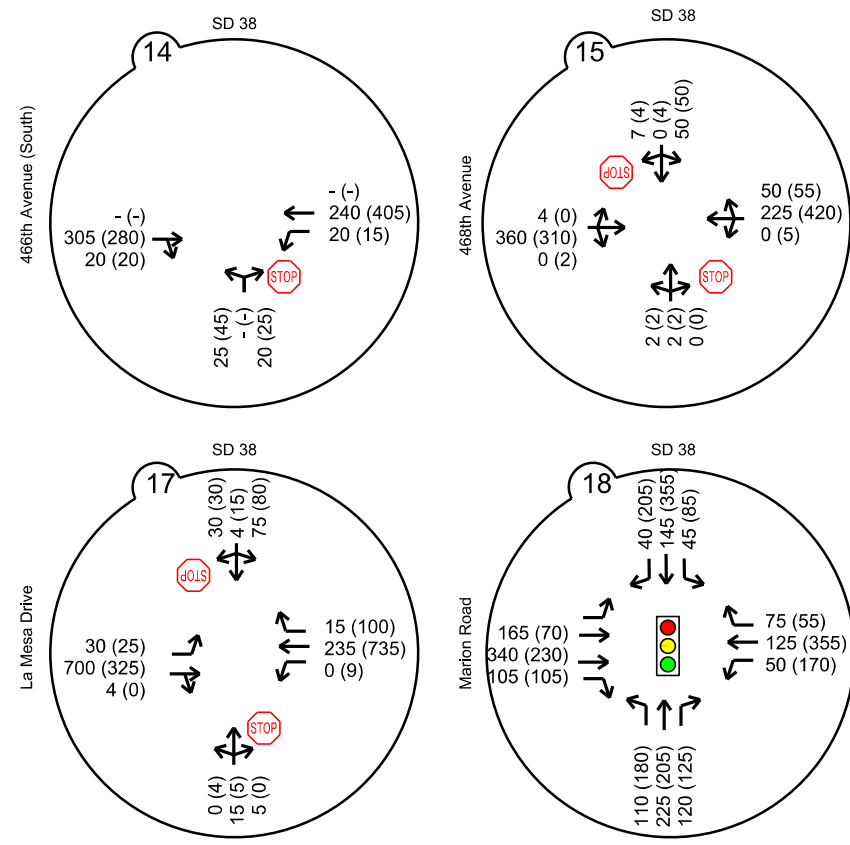
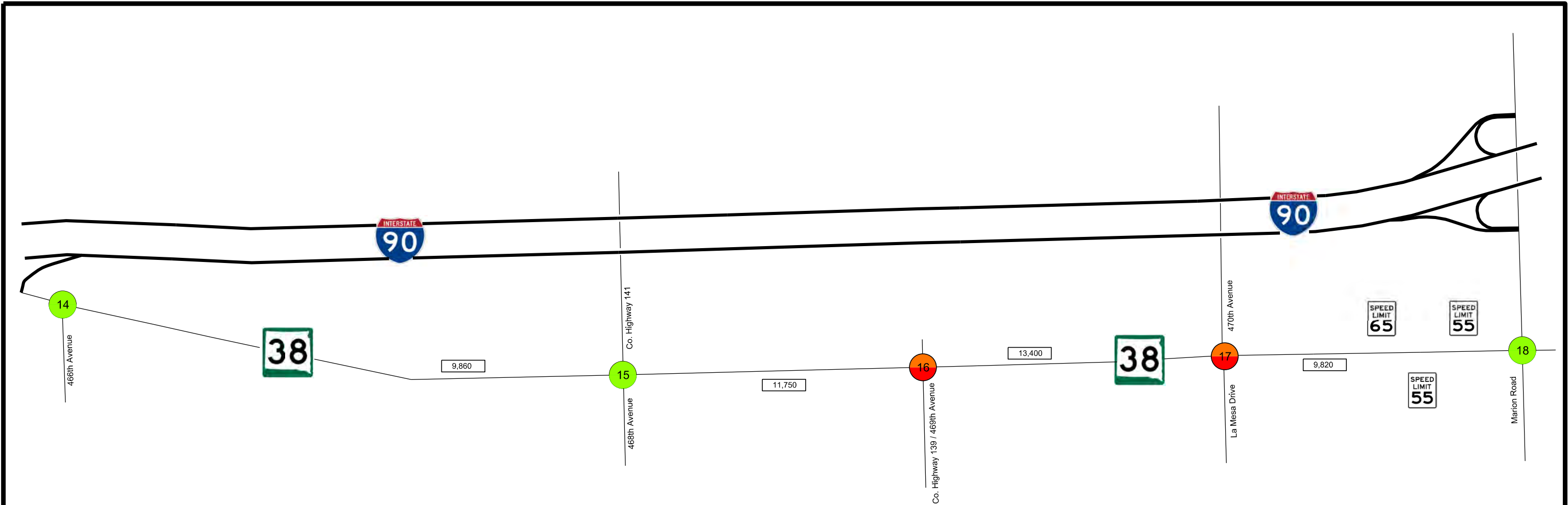


INTERSECTION PEAK HOUR OPERATIONS

ID	INTERSECTIONS	CONTROL TYPE		HCM 7TH EDITION LEVEL OF SERVICE	
		SIGNAL	STOP	AM	PM
4	SD Highway 38 & Western Ave / 463rd Ave		X	C	F
5	SD Highway 38 & Main Ave		X	B	D
6	SD Highway 38 & Vandemark Ave		X	C	C
7	SD Highway 38 & 2nd St		X	C	E
8	SD Highway 38 & West High School Entrance		X	C	B
9	SD Highway 38 & Railroad St / 464th Ave		X	E	E
10	SD Highway 38 & Mickelson Rd / 260th St	X		B	C
11	SD Highway 38 & 466th Ave (North)		X	D	D
12	SD Highway 38 & Westbound Interstate-90		X	B	F
13	SD Highway 38 & Eastbound Interstate-90		X	C	D

NOTES: TWO-WAY STOP CONTROL LOS REPRESENTATIVE OF WORST CASE STOP CONTROLLED APPROACH.
* DENOTES V/C RATIO > 1





INTERSECTION PEAK HOUR OPERATIONS				HCM 7TH EDITION LEVEL OF SERVICE	
ID	INTERSECTIONS	CONTROL TYPE		AM	PM
		SIGNAL	STOP		
14	SD Highway 38 & 466th Ave (South)		X	B	C
15	SD Highway 38 & Co. Hwy 141 / 468th Ave		X	C	C
16	SD Highway 38 & Co. Hwy 139 / 469th Ave		X	E	F
17	SD Highway 38 & La Mesa Drive / 470th Ave		X	E	F
18	SD Highway 38 & Marion Drive	X		B	C

NOTES: TWO-WAY STOP CONTROL LOS REPRESENTATIVE OF WORST CASE STOP CONTROLLED APPROACH.
* DENOTES V/C RATIO > 1

LEGEND

XX,XXX

2050 AVERAGE DAILY TRAFFIC VOLUME (ADT)

xxx (xxx)

AM (PM) PEAK HOUR VOLUME

AM

PM

INTERSECTION LEVEL OF SERVICE

XX (XX)

XXX (XXX)

XX (XX)

TURNING VOLUME BY MOVEMENT AND LANE CONFIGURATION

TRAFFIC SIGNAL

STOP

STOP CONTROL



Event Traffic Analysis

Traffic data was collected at the I-90 Speedway during a race event which occurred on May 27th, 2023. The traffic data was collected for a 14-hour period between 1PM – 3AM to ensure the entirety of the event traffic was recorded. Review of the traffic data revealed that the peak hours associated with the arrival of vehicles to the event and departure of vehicles from the event were 5:45 – 6:45PM and 12:15 – 1:15AM, respectively. The peak hour traffic volumes can be seen below in **Figure 4**.

FIGURE 4: EVENT TRAFFIC EXHIBIT



Existing Year 2022 traffic operations analysis used existing intersection geometry, event traffic volumes, and posted travel speeds. The results of the intersection capacity analysis can be seen in **Table 13** below.

TABLE 13: HCM TRAFFIC INTERSECTION OPERATIONS – EVENT TRAFFIC

SD Hwy 38 Cross Street(s)	Control Type	Intersection LOS / Delay (sec/veh)				EB	WB	SB
		Arrival		Departure		95% Queue Length (veh)	95% Queue Length (veh)	95% Queue Length (veh)
I-90 Speedway Entrance	TWSC	12.7	B	16.5	C	0.2	0	5.9

Notes: Bold/Highlighted indicates a poor LOS

Under the Existing Year 2022 conditions, the traffic operations analysis showed acceptable operations at the study intersection under the event traffic, with the intersection achieving LOS C or greater during the peak hours. There were no significant delays or vehicle queues produced during the HCM analysis. Observations from review of the video collected at this intersection, indicated that there was a maximum queue of 5 vehicles on the eastbound SD 38 approach. Additionally, there were several observed occurrences of westbound through vehicles utilizing the oncoming traffic lanes to pass slowing or turning vehicles that were entering the speedway.

Predictive Safety Analysis

Safety analysis of locations within the SD Highway 38 study corridor area of influence was completed for the design year 2050 No-Build scenario. Existing crash analysis was completed by summarizing recent historical crashes and reviewing crash trends and can be seen in the previously submitted Existing Traffic and Operations Analysis technical memo. Predictive crash analysis was completed using the Interactive Highway Safety Design Model (IHSDM) Crash Prediction analysis tool to evaluate the safety effects and predict the expected change in crashes between design year scenarios.

Results of the IHSDM evaluation—which supports the Federal Highway Administration's (FHWA's) Data-Driven Safety Analysis (DDSA) initiative—will assist with identifying design features or segments along the roadway with the greatest potential for improvement and quantify its expected safety performance. This approach combined crash, roadway inventory, and traffic volume data to provide more reliable estimates of the proposed roadway's expected safety performance. Ultimately, these results could support agencies decision making in the highway design process and inform the public as to what safety benefits can be expected from the investment.

Design year 2050 crash analysis determined the expected crash frequency and predicted crash frequency within the SD Highway 38 area of influence resulting from the No-Build roadway conditions. Predicted crash frequency is a measure of safety performance based on segments or intersections of a common facility type. Predictive crash frequency accounts for changes in traffic volume, roadway characteristics, and general time trends, but does not consider the historical crash data. The expected crash frequency is the combination of observed and predicted crash frequencies using the Empirical Bayes (EB) method to compute a weighted average. Expected crash frequency accounts for changes in traffic volume, roadway characteristics, and general time trends, and considers the historical crash data. However, the expected crash frequency is not applicable when facility type changes. To account for the potential future roadway changes we have included both the predicted and expected crash results.

In addition to crash frequency, the expected crash severity was determined by IHSDM. Crash severity represents the highest level of injury of all vehicle occupants.

A summary of the expected and predicted crashes for the SD Highway 38 segments between SD Highway 19 and Marion Road are provided in **Table 14** and **Table 15**. Along the SD 38 segments, there were a several segments that produced a high number of crash incidents. The segments from 459th Ave to Western Avenue, Mickelson Road to 466th Avenue (North), and the three segments between 466th Avenue (South) to La Mesa Drive all indicated the potential for safety performance improvements. The expected crash type distribution for segments indicated that run-off road and rear-end crashes were the most frequent crash types.

A summary of the expected and predicted crashes for the SD Highway 38 intersections are provided in **Table 16** and **Table 17**. There were several intersections that demonstrated a high number of crash instances. The SD 38 intersections with Western Avenue/463rd Street, Main Avenue, 2nd Street, Railroad Street/464th Avenue, and Marion Road all indicated the potential for safety performance improvements. The expected crash type distribution for intersections indicated that angle crashes and rear-end crashes were the most frequent crash types.

TABLE 14: SD 38 SEGMENT CRASH FREQUENCY

Location		Segment Length (Miles)	Expected Crashes				Predicted Crashes			
			Total Crashes	Total Crashes/Year	Fatal / Injury Crashes/Year	PDO Crashes/Year	Total Crashes	Total Crashes/Year	Fatal / Injury Crashes/Year	PDO Crashes/Year
Segment 1:	SD Highway 19 to 459 th Avenue	2.05	43.44	1.67	0.50	1.16	47.76	1.83	0.58	1.24
Segment 2:	459 th Avenue to Western Avenue	4.08	104.94	4.03	1.51	2.52	94.87	3.64	1.17	2.47
Segment 3:	Western Avenue to Main Avenue	0.24	7.61	0.29	0.11	0.17	18.36	0.70	0.22	0.47
Segment 4:	Main Avenue to Vandemark Avenue	0.31	17.45	0.67	0.17	0.49	24.91	0.95	0.30	0.65
Segment 5:	Vandemark Avenue to 2 nd Street	0.47	23.07	0.88	0.46	0.41	39.24	1.50	0.48	1.02
Segment 7:	2 nd Street to West Central High School	0.06	20.20	0.77	0.38	0.38	20.20	0.22	0.07	0.15
Segment 8:	West Central High School Entrance to Railroad Street	0.20	7.57	0.29	0.11	0.18	19.83	0.76	0.24	0.51
Segment 9:	Railroad Street to Mickelson Road	0.45	39.15	1.50	0.55	0.94	50.88	1.95	0.62	1.32
Segment 10:	Mickelson Road to 466 th Avenue (North)	1.40	220.30	8.47	3.63	4.83	179.01	6.88	2.21	4.67
Segment 11:	466 th Avenue (North) to WB I-90 Ramps	0.07	2.68	0.10	0.04	0.06	7.75	0.29	0.09	0.20
Segment 12:	WB I-90 Ramps to EB I-90 Ramps	0.28	8.86	0.34	0.12	0.20	23.11	0.88	0.28	0.60
Segment 13:	EB I-90 Ramps to 466 th Avenue (South)	0.07	2.51	0.09	0.03	0.05	7.02	0.27	0.08	0.18
Segment 14:	466 th Avenue (South) to County Highway 141	2.02	85.22	3.27	1.28	1.99	132.89	5.11	1.64	3.47
Segment 15:	County Highway 141 to County Highway 139	1.00	63.35	2.43	0.99	1.44	71.03	2.73	0.87	1.85
Segment 16:	County Highway 139 to La Mesa Drive	1.00	50.98	1.96	0.92	1.03	79.29	3.04	0.97	2.07
Segment 17:	La Mesa Drive to Marion Road	0.97	36.81	1.41	0.57	0.82	58.75	2.25	0.71	1.53
Total	All SD 38 Segments	14.67	734.14	28.17	11.37	16.67	874.90	33.00	10.53	22.40

Source: Interactive Highway Safety Design Model (IHSDM) 2021 Release, v17.0.0, HR Green, 2023.

TABLE 15: EXPECTED SEGMENT MANNER OF CRASH

Manner of Crash	Total Crashes
Collision with Animal	87.57
Sideswipe - same direction	28.80
Run Off Road	376.14
Angle	62.28
Rear-end	110.11
Others	78.34
Total Crashes	743.24

TABLE 16: SD 38 INTERSECTION CRASH FREQUENCY

Location		Expected Crashes				Predicted Crashes			
		Total Crashes	Total Crashes/Year	Fatal / Injury Crashes/Year	PDO Crashes/Year	Total Crashes	Total Crashes/Year	Fatal / Injury Crashes/Year	PDO Crashes/Year
Intersection 1:	SD Highway 19 / 457 th Avenue	18.39	0.70	0.19	0.50	21.11	0.81	0.33	0.47
Intersection 2:	459 th Avenue	18.94	0.72	0.29	0.43	27.93	1.07	0.46	0.61
Intersection 3:	I-90 Speedway Entrance	NA	NA	NA	NA	NA	NA	NA	NA
Intersection 4:	Western Avenue / 463 rd Avenue	87.65	3.37	1.60	1.76	169.48	6.51	2.80	3.70
Intersection 5:	Main Avenue	42.11	1.61	0.67	0.94	132.77	5.10	2.20	2.90
Intersection 6:	Vandemark Avenue	28.33	1.08	0.50	0.58	74.90	2.88	1.24	1.63
Intersection 7:	2 nd Street	56.15	2.15	0.81	1.34	166.63	6.40	2.76	3.64
Intersection 8:	West Central High School Entrance	18.93	0.72	0.33	0.38	73.62	2.83	1.17	1.65
Intersection 9:	Railroad Street / 464 th Avenue	53.57	2.06	1.17	0.88	137.23	5.27	2.27	3.00
Intersection 10:	Mickelson Road/260 th Street	38.24	1.47	0.68	0.78	160.99	6.19	2.56	3.62
Intersection 11:	466 th Avenue North	24.85	0.95	0.32	0.62	33.89	1.30	0.54	0.76
Intersection 12:	WB I-90 Exit 390	20.00	0.76	0.41	0.35	15.08	0.58	0.19	0.38
Intersection 13:	EB I-90 Exit 390	9.41	0.36	0.15	0.20	10.35	0.39	0.13	0.26
Intersection 14:	466 th Avenue South	29.18	1.12	0.40	0.71	75.53	2.90	1.20	1.69
Intersection 15:	County Highway 141 / 468 th Avenue	44.28	1.70	0.95	0.74	87.10	3.35	1.44	1.90
Intersection 16:	County Highway 139 / 469 th Avenue	32.02	1.23	0.57	0.66	57.44	2.20	0.91	1.29
Intersection 17:	La Mesa Drive / 470 th Avenue	46.40	1.78	0.73	1.04	61.03	2.34	1.01	1.33
Intersection 18:	Marion Road	114.94	4.42	1.53	2.88	50.33	1.93	0.63	1.30
Total	All SD 38 Intersections	683.39	26.20	11.30	14.79	1,355.41	52.05	21.84	30.13

Source: Interactive Highway Safety Design Model (IHSDM) 2021 Release, v17.0.0, HR Green, 2023.

TABLE 17: EXPECTED INTERSECTION MANNER OF CRASH

Manner of Crash	Total Crashes
Run Off Road	85.49
Angle	245.00
Sideswipe	59.86
Head-on	27.53
Rear-end	196.55
Others	67.73
Total Crashes	682.16

Summary

The purpose of this technical memorandum is to document the future no-build traffic assessment at the eighteen study intersections and associated highway corridor segments along the SD Highway 38 corridor, from the SD Highway 19 intersection in Humboldt, South Dakota to the Marion Road intersection in Sioux Falls, South Dakota.

Future year 2050 traffic forecasts were constructed using traffic data supplied by the SFMPO and the SDDOT. This data was used to develop 2050 design year morning (AM) and afternoon (PM) peak hour volumes at study intersections. To develop the interim year traffic conditions, straight-line growth rates between the existing year ADT volumes and the estimated 2050 ADT volumes were calculated and the interim year traffic volumes were interpolated to develop interim year 2029 and 2040 traffic forecasts.

Using the established traffic volumes, the traffic operations at study intersections and along the two-lane highway were evaluated. The no-build conditions traffic assessment revealed that there are intersections and highway segments that will need capacity improvements within the design year timeframe.

The traffic operations analysis indicated that the following intersections and highway segments should be investigated for future capacity or operational improvements:

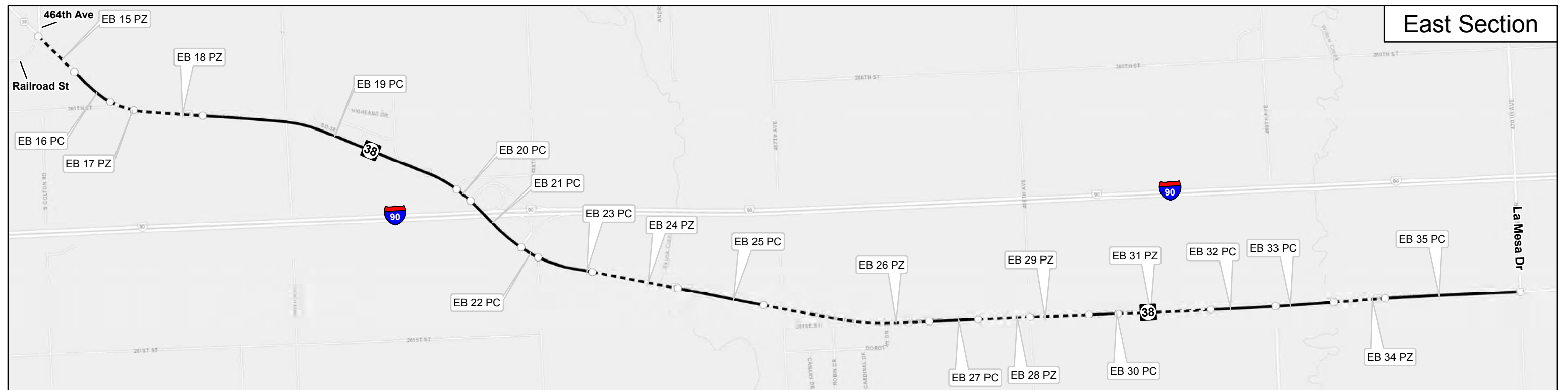
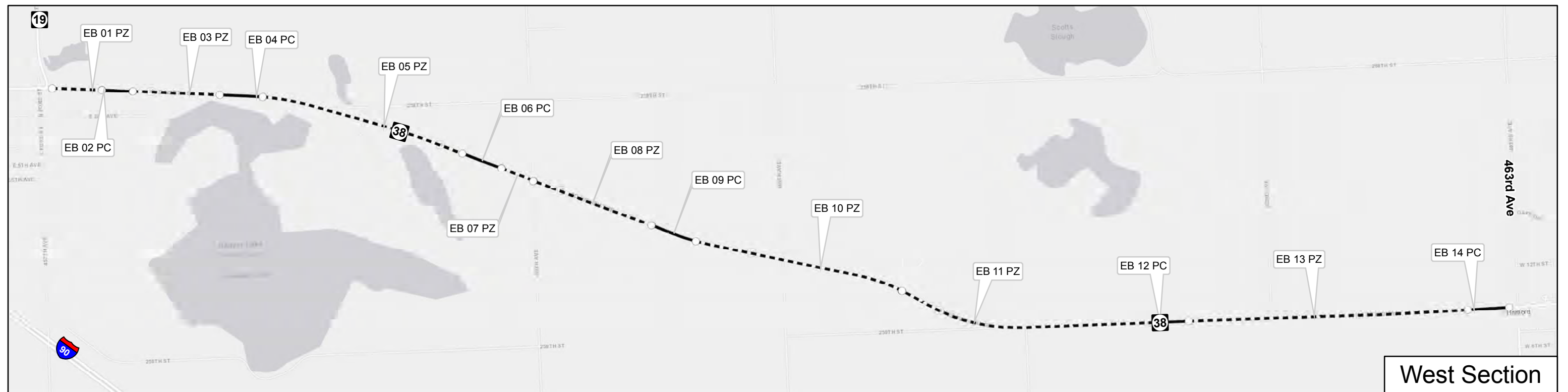
- ◆ SD Highway 38 & Western Avenue/463rd Avenue,
- ◆ SD Highway 38 & Main Avenue,
- ◆ SD Highway 38 & 2nd Street,
- ◆ SD Highway 38 & Railroad Street/464th Avenue,
- ◆ SD Highway 38 & 466th Avenue (North),
- ◆ SD Highway 38 & WB I-90 ramps,
- ◆ SD Highway 38 & EB I-90 ramps,
- ◆ SD Highway 38 & County Highway 139/469th Avenue, and
- ◆ SD Highway 38 & La Mesa Drive/470th Avenue,
- ◆ SD Highway 38 segment between Railroad Street/464th Street and EB I-90 ramps,
- ◆ SD Highway 38 segment between County Highway 139/469th Avenue and La Mesa Drive/470th Avenue.

A predictive safety analysis of the SD Highway 38 study corridor was completed for the design year 2050 No-Build scenario. Along the SD 38 segments, there were a several intersections and highway segments that produced a high number of crash incidents that indicated a need for potential safety improvements.

The traffic safety analysis indicated that the following intersections and highway segments should be investigated for future safety improvements:

- ◆ SD Highway 38 & Western Avenue/463rd Avenue,
- ◆ SD Highway 38 & Main Avenue,
- ◆ SD Highway 38 & 2nd Street,
- ◆ SD Highway 38 & Railroad Street/464th Avenue,
- ◆ SD Highway 38 & Mickelson Road/260th Street, and
- ◆ SD Highway 38 & Marion Road,
- ◆ SD Highway 38 segment between 459th Street and Western Avenue/463rd Avenue,
- ◆ SD Highway 38 segment between Mickelson Road/260th Street and 466th Avenue (North),
- ◆ SD Highway 38 segment between 466th Avenue (South) and La Mesa Drive/470th Avenue.

Appendix A – Two-lane Highway Segmentation



Highway 38 Analysis Segments

Eastbound Lanes

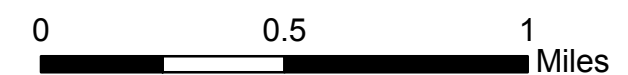
FIGURE 6

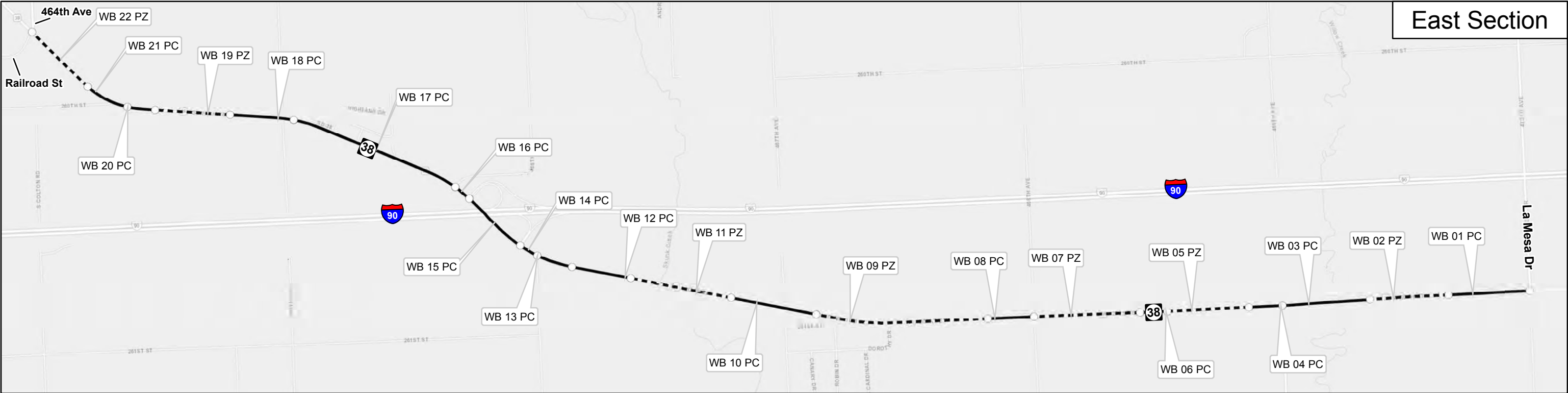
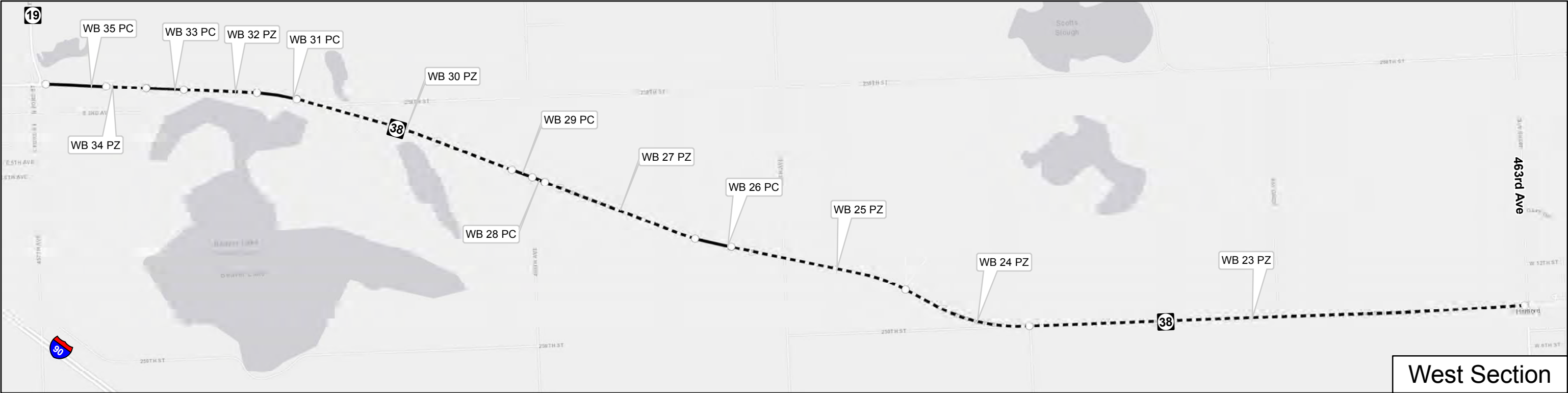
Legend

Analysis Segments

— Passing Constrained

----- Passing Zones





Highway 38 Analysis Segments

Westbound Lanes

FIGURE 6

Legend

- Analysis Segments**
- Passing Constrained
 - - - - - Passing Zones



0 0.5 1 Miles

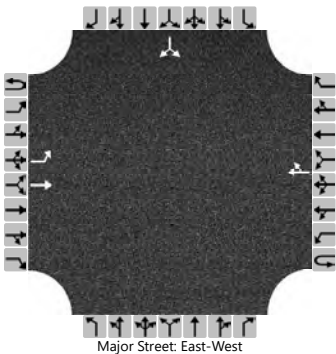


Appendix B – HCS Output

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD 38 & SD 19
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/4/2023	East/West Street	SD 38
Analysis Year	2029	North/South Street	SD 19
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	0	1	0		0	0	0		0	1	0
Configuration		L	T					TR							LR	
Volume (veh/h)		35	110				85	30						45		60
Percent Heavy Vehicles (%)		30												9		11
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)		4.40												6.49		6.31
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.47												3.58		3.40

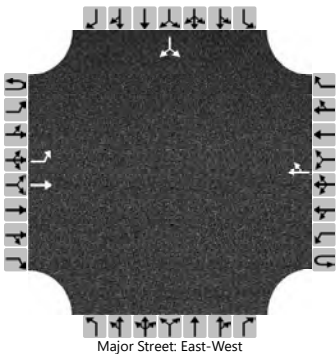
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		38													114	
Capacity, c (veh/h)		1305													784	
v/c Ratio		0.03													0.15	
95% Queue Length, Q ₉₅ (veh)		0.1													0.5	
Control Delay (s/veh)		7.8													10.4	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	1.9												10.4			
Approach LOS	A												B			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD 38 & SD 19
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/4/2023	East/West Street	SD 38
Analysis Year	2029	North/South Street	SD 19
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	0	1	0		0	0	0		0	1	0
Configuration		L	T					TR							LR	
Volume (veh/h)		55	85				115	50						25		30
Percent Heavy Vehicles (%)		2												10		14
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)		4.12												6.50		6.34
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.59		3.43

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		60													60	
Capacity, c (veh/h)		1396													715	
v/c Ratio		0.04													0.08	
95% Queue Length, Q ₉₅ (veh)		0.1													0.3	
Control Delay (s/veh)		7.7													10.5	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	3.0												10.5			
Approach LOS	A												B			

HCS Two-Way Stop-Control Report

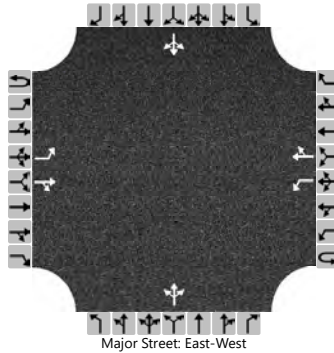
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/4/2023
Analysis Year	2029
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & 459th
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	459th Ave
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	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		0	145	5		1	105	0		9	0	5		6	0	0
Percent Heavy Vehicles (%)		3				3				13	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.13				4.13				7.23	6.50	6.20		7.10	6.50	6.20
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)		2.23				2.23				3.62	4.00	3.30		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

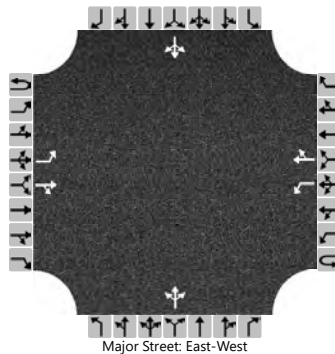
Flow Rate, v (veh/h)		0				1					15				7	
Capacity, c (veh/h)		1469				1410					722				678	
v/c Ratio		0.00				0.00					0.02				0.01	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.1				0.0	
Control Delay (s/veh)		7.5				7.6					10.1				10.4	
Level of Service (LOS)		A				A					B				B	
Approach Delay (s/veh)	0.0				0.1				10.1				10.4			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & 459th
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/4/2023	East/West Street	SD 38
Analysis Year	2029	North/South Street	459th Ave
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		0	100	6		8	175	1		9	0	2		1	1	0
Percent Heavy Vehicles (%)		0				0				13	0	0		0	100	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.10				7.23	6.50	6.20		7.10	7.50	6.20
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)		2.20				2.20				3.62	4.00	3.30		3.50	4.90	3.30

Delay, Queue Length, and Level of Service

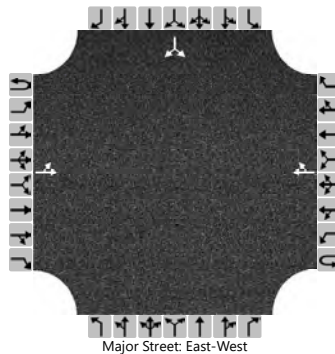
Flow Rate, v (veh/h)		0				9					12				2	
Capacity, c (veh/h)		1394				1486					649				534	
v/c Ratio		0.00				0.01					0.02				0.00	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.1				0.0	
Control Delay (s/veh)		7.6				7.4					10.6				11.8	
Level of Service (LOS)		A				A					B				B	
Approach Delay (s/veh)	0.0				0.3				10.6				11.8			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & I-90 Expressway
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/4/2023	East/West Street	SD 38
Analysis Year	2029	North/South Street	I-90 Expressway
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		0	155				115	0						0		0
Percent Heavy Vehicles (%)		3												3		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

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

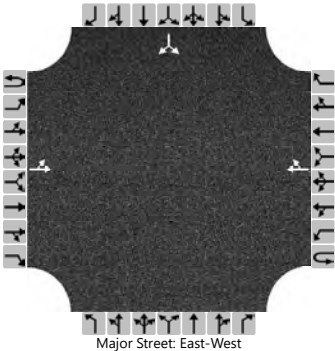
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0													0	
Capacity, c (veh/h)		1455													0	
v/c Ratio		0.00														
95% Queue Length, Q ₉₅ (veh)		0.0														
Control Delay (s/veh)		7.5	0.0													
Level of Service (LOS)		A	A													
Approach Delay (s/veh)	0.0															
Approach LOS	A															

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD 38 & I-90 Expressway
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/4/2023	East/West Street	SD 38
Analysis Year	2029	North/South Street	I-90 Expressway
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		0	115				175	0						0		0
Percent Heavy Vehicles (%)		3												3		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

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

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0													0	
Capacity, c (veh/h)		1378													0	
v/c Ratio		0.00														
95% Queue Length, Q ₉₅ (veh)		0.0														
Control Delay (s/veh)		7.6	0.0													
Level of Service (LOS)		A	A													
Approach Delay (s/veh)	0.0															
Approach LOS	A															

HCS Two-Way Stop-Control Report

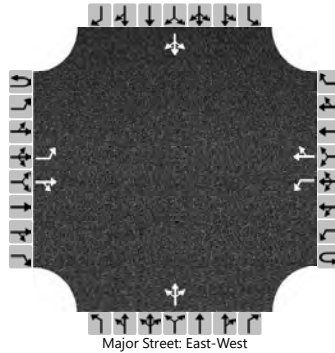
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/4/2023
Analysis Year	2029
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & 463rd Ave / Western Ave
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	463rd Ave / Western Ave
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	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		6	120	55		40	80	20		40	50	60		30	50	3
Percent Heavy Vehicles (%)		3				3				14	2	6		0	7	33
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.13				4.13				7.24	6.52	6.26		7.10	6.57	6.53
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)		2.23				2.23				3.63	4.02	3.35		3.50	4.06	3.60

Delay, Queue Length, and Level of Service

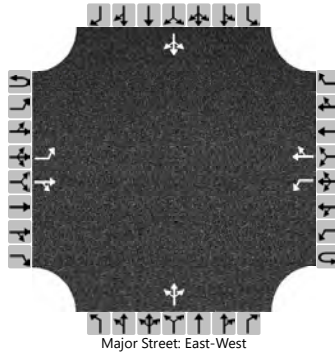
Flow Rate, v (veh/h)		7				43					163				90	
Capacity, c (veh/h)		1476				1378					615				514	
v/c Ratio		0.00				0.03					0.26				0.18	
95% Queue Length, Q ₉₅ (veh)		0.0				0.1					1.1				0.6	
Control Delay (s/veh)		7.5				7.7					12.9				13.5	
Level of Service (LOS)		A				A					B				B	
Approach Delay (s/veh)	0.2				2.2				12.9				13.5			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & 463rd Ave / Western Ave
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/4/2023	East/West Street	SD 38
Analysis Year	2029	North/South Street	463rd Ave / Western Ave
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		10	85	35		80	135	40		45	55	100		35	65	15
Percent Heavy Vehicles (%)		22				3				0	11	4		0	4	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.32				4.13				7.10	6.61	6.24		7.10	6.54	6.20
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)		2.40				2.23				3.50	4.10	3.34		3.50	4.04	3.30

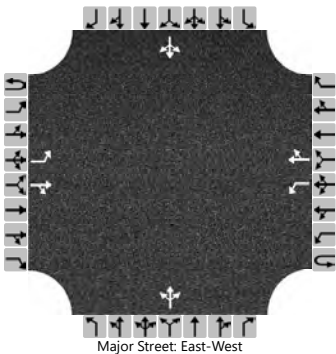
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11				87					217				125	
Capacity, c (veh/h)		1272				1449					568				437	
v/c Ratio		0.01				0.06					0.38				0.29	
95% Queue Length, Q ₉₅ (veh)		0.0				0.2					1.8				1.2	
Control Delay (s/veh)		7.9				7.6					15.2				16.5	
Level of Service (LOS)		A				A					C				C	
Approach Delay (s/veh)	0.6				2.4				15.2				16.5			
Approach LOS	A				A				C				C			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD 38 & Main Ave
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/4/2023	East/West Street	SD 38
Analysis Year	2029	North/South Street	Main Ave (9th St)
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		1	175	20		25	135	15		25	3	60		5	7	2
Percent Heavy Vehicles (%)		0				11				5	0	2		0	17	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.21				7.15	6.50	6.22		7.10	6.67	6.20
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)		2.20				2.30				3.55	4.00	3.32		3.50	4.15	3.30

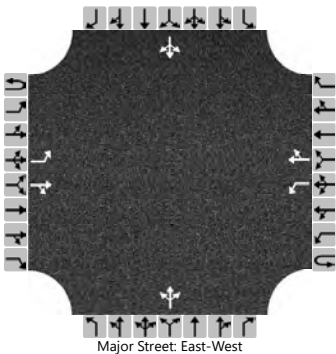
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		1				27					96				15	
Capacity, c (veh/h)		1428				1307					706				529	
v/c Ratio		0.00				0.02					0.14				0.03	
95% Queue Length, Q ₉₅ (veh)		0.0				0.1					0.5				0.1	
Control Delay (s/veh)		7.5				7.8					10.9				12.0	
Level of Service (LOS)		A				A					B				B	
Approach Delay (s/veh)	0.0				1.1				10.9				12.0			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD 38 & Main Ave
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/4/2023	East/West Street	SD 38
Analysis Year	2029	North/South Street	Main Ave (9th St)
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		7	175	30		45	225	40		20	15	40		25	20	5
Percent Heavy Vehicles (%)		0				0				5	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.10				7.15	6.50	6.20		7.10	6.50	6.20
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)		2.20				2.20				3.55	4.00	3.30		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

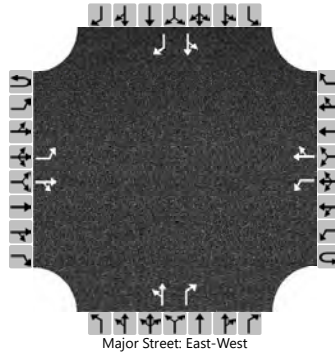
Flow Rate, v (veh/h)		8				49					82				54	
Capacity, c (veh/h)		1286				1358					544				406	
v/c Ratio		0.01				0.04					0.15				0.13	
95% Queue Length, Q ₉₅ (veh)		0.0				0.1					0.5				0.5	
Control Delay (s/veh)		7.8				7.7					12.8				15.2	
Level of Service (LOS)		A				A					B				C	
Approach Delay (s/veh)	0.3				1.1				12.8				15.2			
Approach LOS	A				A				B				C			

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & Vandemark Ave
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/4/2023	East/West Street	SD 38
Analysis Year	2029	North/South Street	Vandemark Avenue
Time Analyzed	AM	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	0		0	1	1		0	1	1
Configuration		L		TR		L		TR		LT		R		LT		R
Volume (veh/h)		20	260	7		7	180	20		6	4	9		30	1	15
Percent Heavy Vehicles (%)		0				0				40	0	0		0	0	7
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized									No				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)		4.10				4.10				7.50	6.50	6.20		7.10	6.50	6.27
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)		2.20				2.20				3.86	4.00	3.30		3.50	4.00	3.36

Delay, Queue Length, and Level of Service

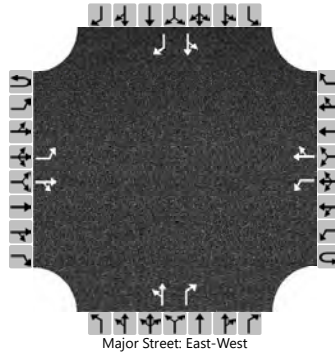
Flow Rate, v (veh/h)		22				8				11		10		34		16
Capacity, c (veh/h)		1364				1283				399		757		429		821
v/c Ratio		0.02				0.01				0.03		0.01		0.08		0.02
95% Queue Length, Q ₉₅ (veh)		0.0				0.0				0.1		0.0		0.3		0.1
Control Delay (s/veh)		7.7				7.8				14.3		9.8		14.1		9.5
Level of Service (LOS)		A				A				B		A		B		A
Approach Delay (s/veh)	0.5				0.3				12.2				12.6			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & Vandemark Ave
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/4/2023	East/West Street	SD 38
Analysis Year	2029	North/South Street	Vandemark Avenue
Time Analyzed	PM	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	0		0	1	1		0	1	1
Configuration		L		TR		L		TR		LT		R		LT		R
Volume (veh/h)		15	185	2		5	330	30		0	0	8		20	0	20
Percent Heavy Vehicles (%)		0				0				0	0	100		0	0	7
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized									No				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)		4.10				4.10				7.10	6.50	7.20		7.10	6.50	6.27
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)		2.20				2.20				3.50	4.00	4.20		3.50	4.00	3.36

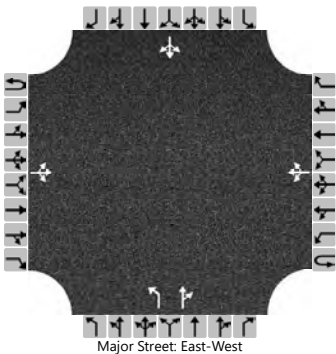
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		16				5				0		9		22		22
Capacity, c (veh/h)		1178				1381				0		642		391		660
v/c Ratio		0.01				0.00						0.01		0.06		0.03
95% Queue Length, Q ₉₅ (veh)		0.0				0.0						0.0		0.2		0.1
Control Delay (s/veh)		8.1				7.6						10.7		14.7		10.6
Level of Service (LOS)		A				A						B		B		B
Approach Delay (s/veh)	0.6				0.1								12.7			
Approach LOS	A				A								B			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD 38 & 2nd St
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/4/2023	East/West Street	SD 38
Analysis Year	2029	North/South Street	2nd St
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		1	1	0		0	1	0
Configuration			LTR				LTR			L		TR			LTR	
Volume (veh/h)		10	230	7		65	155	10		4	15	105		25	35	15
Percent Heavy Vehicles (%)		10				16				33	8	5		0	4	8
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.20				4.26				7.43	6.58	6.25		7.10	6.54	6.28
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)		2.29				2.34				3.80	4.07	3.35		3.50	4.04	3.37

Delay, Queue Length, and Level of Service

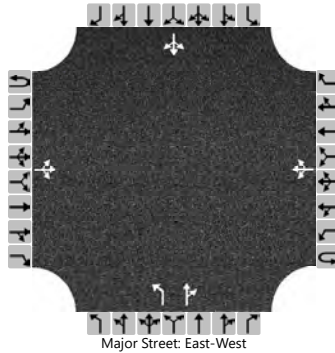
Flow Rate, v (veh/h)		11				71				4		130			82	
Capacity, c (veh/h)		1323				1230				303		683			392	
v/c Ratio		0.01				0.06				0.01		0.19			0.21	
95% Queue Length, Q ₉₅ (veh)		0.0				0.2				0.0		0.7			0.8	
Control Delay (s/veh)		7.7	0.1	0.1		8.1	0.5	0.5		17.0		11.5			16.6	
Level of Service (LOS)		A	A	A		A	A	A		C		B			C	
Approach Delay (s/veh)	0.4				2.7				11.7				16.6			
Approach LOS	A				A				B				C			

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & 2nd St
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/4/2023	East/West Street	SD 38
Analysis Year	2029	North/South Street	2nd St
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		1	1	0		0	1	0
Configuration			LTR				LTR			L		TR			LTR	
Volume (veh/h)		20	175	6		90	345	15		9	20	45		10	20	15
Percent Heavy Vehicles (%)		0				0				0	0	6		0	6	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.10				7.10	6.50	6.26		7.10	6.56	6.20
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)		2.20				2.20				3.50	4.00	3.35		3.50	4.05	3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		22				98				10		71			49	
Capacity, c (veh/h)		1155				1388				238		508			315	
v/c Ratio		0.02				0.07				0.04		0.14			0.16	
95% Queue Length, Q ₉₅ (veh)		0.1				0.2				0.1		0.5			0.5	
Control Delay (s/veh)		8.2	0.2	0.2		7.8	0.7	0.7		20.7		13.2			18.5	
Level of Service (LOS)		A	A	A		A	A	A		C		B			C	
Approach Delay (s/veh)	1.0				2.1				14.1				18.5			
Approach LOS	A				A				B				C			

HCS Two-Way Stop-Control Report

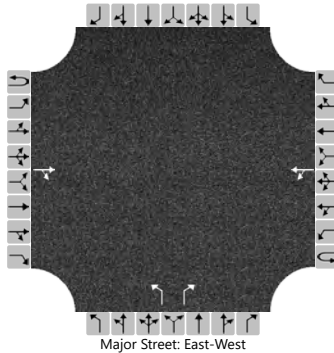
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/5/2023
Analysis Year	2029
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & West Central HS Entrance
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	West Central HS Entrance
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	0	1	0	0	0	1	0		1	0	1		0	0	0
Configuration				TR		LT				L		R				
Volume (veh/h)			300	60		35	215			25		35				
Percent Heavy Vehicles (%)						0				0		0				
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)						4.10				6.40		6.20				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.20				3.50		3.30				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						38				27		38				
Capacity, c (veh/h)						1178				410		690				
v/c Ratio						0.03				0.07		0.06				
95% Queue Length, Q ₉₅ (veh)						0.1				0.2		0.2				
Control Delay (s/veh)						8.2	0.3			14.4		10.5				
Level of Service (LOS)						A	A			B		B				
Approach Delay (s/veh)					1.4				12.1							
Approach LOS					A				B							

HCS Two-Way Stop-Control Report

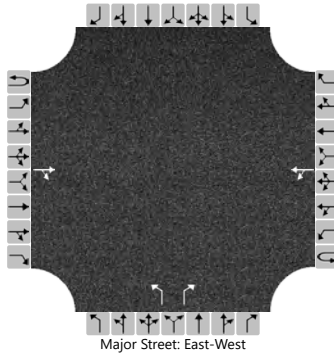
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/5/2023
Analysis Year	2029
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & West Central HS Entrance
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	West Central HS Entrance
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	0	1	0	0	0	1	0		1	0	1		0	0	0
Configuration				TR		LT				L		R				
Volume (veh/h)			225	2		2	440			10		10				
Percent Heavy Vehicles (%)						0				0		0				
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)						4.10				6.40		6.20				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.20				3.50		3.30				

Delay, Queue Length, and Level of Service

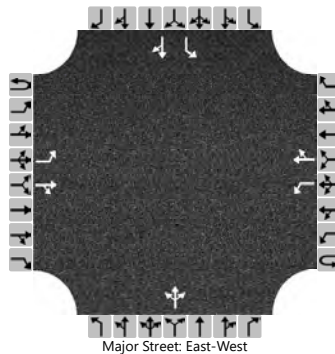
Flow Rate, v (veh/h)						2				11		11				
Capacity, c (veh/h)						1331				392		798				
v/c Ratio						0.00				0.03		0.01				
95% Queue Length, Q ₉₅ (veh)						0.0				0.1		0.0				
Control Delay (s/veh)						7.7	0.0			14.4		9.6				
Level of Service (LOS)						A	A			B		A				
Approach Delay (s/veh)					0.1				12.0							
Approach LOS					A				B							

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & Railroad Street
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/4/2023	East/West Street	SD 38
Analysis Year	2029	North/South Street	Railroad St
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	0		0	1	0		1	1	0
Configuration		L		TR		L		TR			LTR			L		TR
Volume (veh/h)		2	330	0		10	205	65		1	0	20		100	2	4
Percent Heavy Vehicles (%)		0				0				0	0	15		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.10				7.10	6.50	6.35		7.10	6.50	6.20
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)		2.20				2.20				3.50	4.00	3.44		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		2				11					23			109		7
Capacity, c (veh/h)		1280				1211					638			372		587
v/c Ratio		0.00				0.01					0.04			0.29		0.01
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.1			1.2		0.0
Control Delay (s/veh)		7.8				8.0					10.9			18.6		11.2
Level of Service (LOS)		A				A					B			C		B
Approach Delay (s/veh)	0.0				0.3				10.9				18.2			
Approach LOS	A				A				B				C			

HCS Two-Way Stop-Control Report

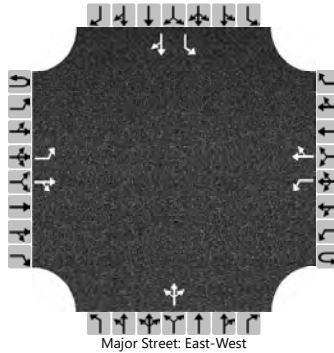
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/4/2023
Analysis Year	2029
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & Railroad Street
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	Railroad St
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	0	0	1	1	0		0	1	0		1	1	0
Configuration		L		TR		L		TR			LTR			L		TR
Volume (veh/h)		2	250	2		10	400	105		1	1	10		60	6	4
Percent Heavy Vehicles (%)		0				40				0	0	15		5	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.50				7.10	6.50	6.35		7.15	6.50	6.20
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)		2.20				2.56				3.50	4.00	3.44		3.55	4.00	3.30

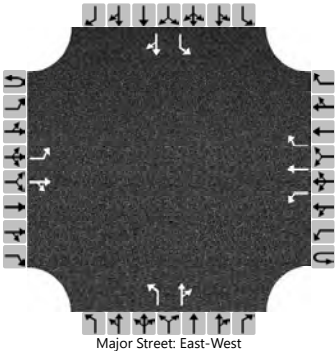
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		2				11					13			65		11
Capacity, c (veh/h)		1031				1099					599			295		390
v/c Ratio		0.00				0.01					0.02			0.22		0.03
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.1			0.8		0.1
Control Delay (s/veh)		8.5				8.3					11.1			20.6		14.5
Level of Service (LOS)		A				A					B			C		B
Approach Delay (s/veh)	0.1				0.2				11.1				19.8			
Approach LOS	A				A				B				C			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD 38 & 260th St (Mickelson Rd)
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/4/2023	East/West Street	SD 38
Analysis Year	2029	North/South Street	260th St (Mikelson Rd)
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	1		1	1	0		1	1	0
Configuration		L		TR		L	T	R		L		TR		L		TR
Volume (veh/h)		55	355	25		30	210	75		30	25	70		100	20	80
Percent Heavy Vehicles (%)		3				26				4	3	3		3	3	3
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)		4.13				4.36				7.14	6.53	6.23		7.13	6.53	6.23
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)		2.23				2.43				3.54	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

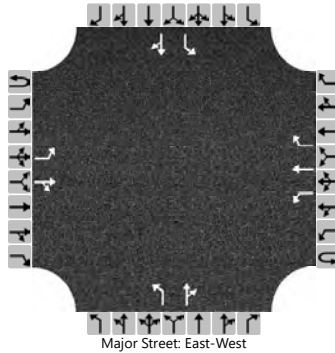
Flow Rate, v (veh/h)		60				33				33		103		109		109
Capacity, c (veh/h)		1245				1028				222		463		217		589
v/c Ratio		0.05				0.03				0.15		0.22		0.50		0.18
95% Queue Length, Q ₉₅ (veh)		0.2				0.1				0.5		0.8		2.5		0.7
Control Delay (s/veh)		8.0				8.6				24.0		15.0		37.1		12.5
Level of Service (LOS)		A				A				C		B		E		B
Approach Delay (s/veh)	1.0				0.8				17.2				24.8			
Approach LOS	A				A				C				C			

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & 260th St (Mickelson Rd)
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/4/2023	East/West Street	SD 38
Analysis Year	2029	North/South Street	260th St (Mickelson Rd)
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	1		1	1	0		1	1	0
Configuration		L		TR		L	T	R		L		TR		L		TR
Volume (veh/h)		75	205	15		90	445	105		10	30	30		90	15	65
Percent Heavy Vehicles (%)		3				1				0	3	0		3	3	3
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)		4.13				4.11				7.10	6.53	6.20		7.13	6.53	6.23
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)		2.23				2.21				3.50	4.03	3.30		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		82				98				11		65		98		87
Capacity, c (veh/h)		974				1334				136		266		130		414
v/c Ratio		0.08				0.07				0.08		0.25		0.75		0.21
95% Queue Length, Q ₉₅ (veh)		0.3				0.2				0.3		0.9		4.4		0.8
Control Delay (s/veh)		9.0				7.9				33.8		22.9		88.8		16.0
Level of Service (LOS)		A				A				D		C		F		C
Approach Delay (s/veh)	2.3				1.1				24.4				54.5			
Approach LOS	A				A				C				F			

HCS Two-Way Stop-Control Report

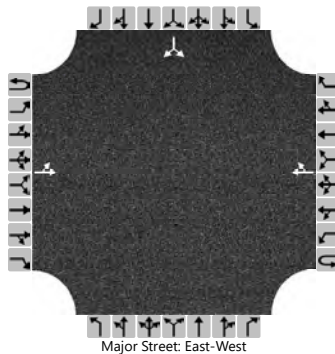
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/4/2023
Analysis Year	2029
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD38 & 466th Ave
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	466th Ave
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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		1	520				315	4						2		0
Percent Heavy Vehicles (%)		0												50		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.90		6.23
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.95		3.33

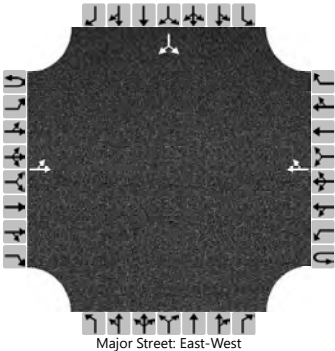
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		1													2	
Capacity, c (veh/h)		1223													251	
v/c Ratio		0.00													0.01	
95% Queue Length, Q ₉₅ (veh)		0.0													0.0	
Control Delay (s/veh)		7.9	0.0												19.5	
Level of Service (LOS)		A	A												C	
Approach Delay (s/veh)	0.0												19.5			
Approach LOS	A												C			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD38 & 466th Ave
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/4/2023	East/West Street	SD 38
Analysis Year	2029	North/South Street	466th Ave
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		0	325				650	1						4		1
Percent Heavy Vehicles (%)		0												33		0
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)		4.10												6.73		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.80		3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0													5	
Capacity, c (veh/h)		900													241	
v/c Ratio		0.00													0.02	
95% Queue Length, Q ₉₅ (veh)		0.0													0.1	
Control Delay (s/veh)		9.0	0.0												20.3	
Level of Service (LOS)		A	A												C	
Approach Delay (s/veh)	0.0												20.3			
Approach LOS	A												C			

HCS Two-Way Stop-Control Report

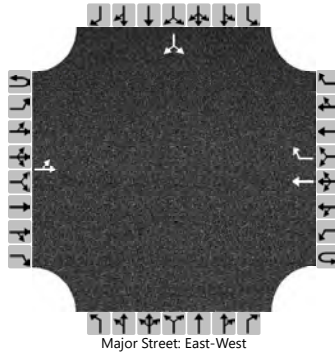
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/4/2023
Analysis Year	2029
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & I-90 WB Terminal
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	I-90 WB Terminal
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	0	1	0	0	0	1	1		0	0	0		0	1	0
Configuration		LT					T	R							LR	
Volume (veh/h)		35	515				185	15						10		140
Percent Heavy Vehicles (%)		0												56		12
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)		4.10												6.96		6.32
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												4.00		3.41

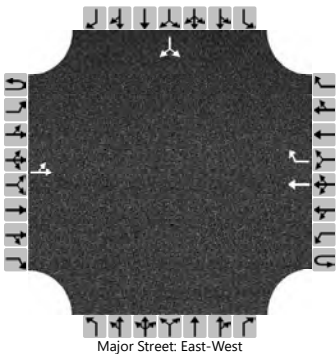
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		38													163	
Capacity, c (veh/h)		1364													715	
v/c Ratio		0.03													0.23	
95% Queue Length, Q ₉₅ (veh)		0.1													0.9	
Control Delay (s/veh)		7.7	0.3												11.5	
Level of Service (LOS)		A	A												B	
Approach Delay (s/veh)	0.8												11.5			
Approach LOS	A												B			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD 38 & I-90 WB Terminal
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/4/2023	East/West Street	SD 38
Analysis Year	2029	North/South Street	I-90 WB Terminal
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	1		0	0	0		0	1	0
Configuration		LT					T	R							LR	
Volume (veh/h)		25	300				300	25						20		355
Percent Heavy Vehicles (%)		0												6		2
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)		4.10												6.46		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.55		3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		27													408	
Capacity, c (veh/h)		1217													684	
v/c Ratio		0.02													0.60	
95% Queue Length, Q ₉₅ (veh)		0.1													4.0	
Control Delay (s/veh)		8.0	0.2												17.7	
Level of Service (LOS)		A	A												C	
Approach Delay (s/veh)	0.8												17.7			
Approach LOS	A												C			

HCS Two-Way Stop-Control Report

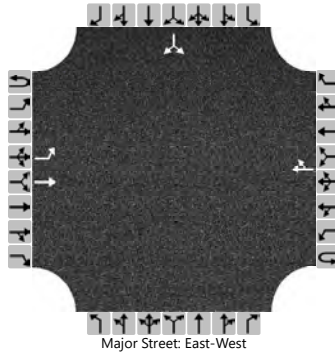
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/4/2023
Analysis Year	2029
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & I-90 EB Ramp Terminal
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	I-90 EB Ramp Terminal
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	0	0	0	1	0		0	0	0		0	1	0
Configuration		L	T					TR							LR	
Volume (veh/h)		305	220				170	15						4		25
Percent Heavy Vehicles (%)		1												33		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.11												6.73		6.23
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.21												3.80		3.33

Delay, Queue Length, and Level of Service

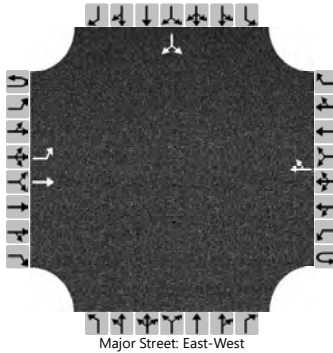
Flow Rate, v (veh/h)		332													32	
Capacity, c (veh/h)		1377													527	
v/c Ratio		0.24													0.06	
95% Queue Length, Q ₉₅ (veh)		0.9													0.2	
Control Delay (s/veh)		8.4													12.3	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	4.9												12.3			
Approach LOS	A												B			

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & I-90 EB Ramp Terminal
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/4/2023	East/West Street	SD 38
Analysis Year	2029	North/South Street	I-90 EB Ramp Terminal
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	0	1	0		0	0	0		0	1	0
Configuration		L	T					TR							LR	
Volume (veh/h)		140	185				290	20						25		35
Percent Heavy Vehicles (%)		12												36		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.22												6.76		6.23
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.31												3.82		3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		152													65	
Capacity, c (veh/h)		1168													412	
v/c Ratio		0.13													0.16	
95% Queue Length, Q ₉₅ (veh)		0.4													0.6	
Control Delay (s/veh)		8.5													15.4	
Level of Service (LOS)		A													C	
Approach Delay (s/veh)	3.7												15.4			
Approach LOS	A												C			

HCS Two-Way Stop-Control Report

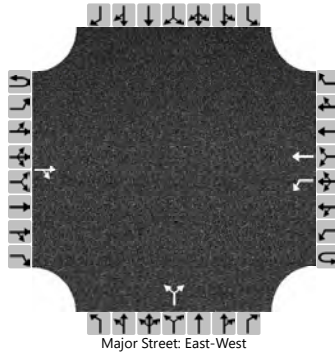
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/5/2023
Analysis Year	2029
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & 466th Ave (South)
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	466th Ave (South)
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	0	1	0	0	1	1	0		0	1	0		0	0	0
Configuration				TR		L	T				LR					
Volume (veh/h)			215	15		10	170			20		10				
Percent Heavy Vehicles (%)						20				33		60				
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)						4.30					6.73		6.80			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.38					3.80		3.84			

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						11						33				
Capacity, c (veh/h)						1217						555				
v/c Ratio						0.01						0.06				
95% Queue Length, Q ₉₅ (veh)						0.0						0.2				
Control Delay (s/veh)						8.0						11.9				
Level of Service (LOS)						A						B				
Approach Delay (s/veh)					0.4				11.9							
Approach LOS					A				B							

HCS Two-Way Stop-Control Report

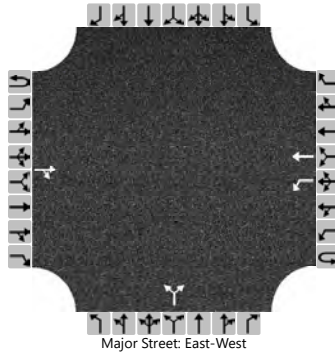
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/5/2023
Analysis Year	2029
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & 466th Ave (South)
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	466th Ave (South)
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	0	1	0	0	1	1	0		0	1	0		0	0	0
Configuration				TR		L	T				LR					
Volume (veh/h)			195	15		10	280			30		15				
Percent Heavy Vehicles (%)						11				20		0				
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)						4.21					6.60		6.20			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.30					3.68		3.30			

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						11						49				
Capacity, c (veh/h)						1289						544				
v/c Ratio						0.01						0.09				
95% Queue Length, Q ₉₅ (veh)						0.0						0.3				
Control Delay (s/veh)						7.8						12.3				
Level of Service (LOS)						A						B				
Approach Delay (s/veh)					0.3				12.3							
Approach LOS					A				B							

HCS Two-Way Stop-Control Report

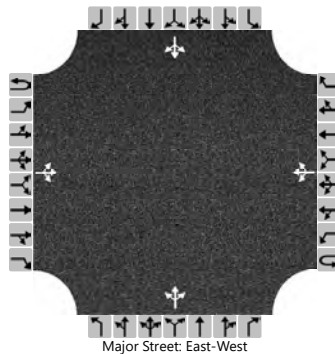
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/5/2023
Analysis Year	2029
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & 468th Avenue
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	468th Ave / County Highway 141
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	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		2	250	0		0	160	35		1	1	0		35	0	5
Percent Heavy Vehicles (%)		0				0				0	100	0		4	0	50
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.10				7.10	7.50	6.20		7.14	6.50	6.70
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)		2.20				2.20				3.50	4.90	3.30		3.54	4.00	3.75

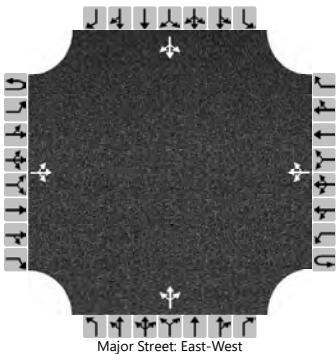
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		2				0					2				43	
Capacity, c (veh/h)		1370				1303					427				520	
v/c Ratio		0.00				0.00					0.01				0.08	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.0				0.3	
Control Delay (s/veh)		7.6	0.0	0.0		7.8	0.0	0.0			13.5				12.6	
Level of Service (LOS)		A	A	A		A	A	A			B				B	
Approach Delay (s/veh)	0.1				0.0				13.5				12.6			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD 38 & 468th Avenue
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/5/2023	East/West Street	SD 38
Analysis Year	2029	North/South Street	468th Ave / County Highway 141
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		0	215	1		4	290	40		1	1	0		35	2	2
Percent Heavy Vehicles (%)		0				0				0	0	0		4	100	50
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.10				7.10	6.50	6.20		7.14	7.50	6.70
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)		2.20				2.20				3.50	4.00	3.30		3.54	4.90	3.75

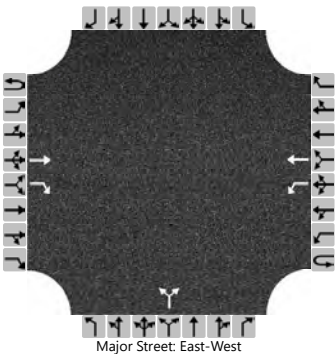
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				4					2				42	
Capacity, c (veh/h)		1211				1344					425				420	
v/c Ratio		0.00				0.00					0.01				0.10	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.0				0.3	
Control Delay (s/veh)		8.0	0.0	0.0		7.7	0.0	0.0			13.5				14.5	
Level of Service (LOS)		A	A	A		A	A	A			B				B	
Approach Delay (s/veh)	0.0				0.1				13.5				14.5			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD 38 & 469th Ave
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/5/2023	East/West Street	SD 38
Analysis Year	2029	North/South Street	469th Ave / Co Hwy 139
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	1	1	0		0	1	0		0	0	0
Configuration			T	R		L	T				LR					
Volume (veh/h)			230	50		50	115			75		190				
Percent Heavy Vehicles (%)						5				13		3				
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)						4.15				6.53		6.23				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.25				3.62		3.33				

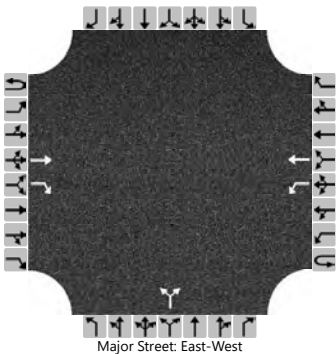
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					54					288						
Capacity, c (veh/h)					1240					676						
v/c Ratio					0.04					0.43						
95% Queue Length, Q ₉₅ (veh)					0.1					2.1						
Control Delay (s/veh)					8.0					14.2						
Level of Service (LOS)					A					B						
Approach Delay (s/veh)					2.4				14.2							
Approach LOS					A				B							

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD 38 & 469th Ave
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/5/2023	East/West Street	SD 38
Analysis Year	2029	North/South Street	469th Ave / Co Hwy 139
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	1	1	0		0	1	0		0	0	0
Configuration			T	R		L	T				LR					
Volume (veh/h)			170	80		190	265			65		80				
Percent Heavy Vehicles (%)						5				2		15				
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)						4.15					6.42		6.35			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.25					3.52		3.44			

Delay, Queue Length, and Level of Service

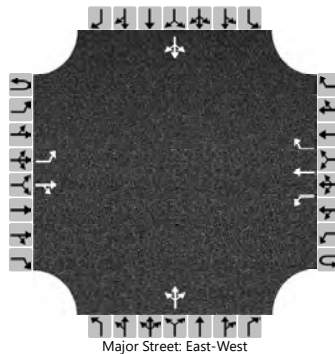
Flow Rate, v (veh/h)						207						158				
Capacity, c (veh/h)						1274						423				
v/c Ratio						0.16						0.37				
95% Queue Length, Q ₉₅ (veh)						0.6						1.7				
Control Delay (s/veh)						8.4						18.5				
Level of Service (LOS)						A						C				
Approach Delay (s/veh)					3.5				18.5							
Approach LOS					A				C							

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & La Mesa
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/5/2023	East/West Street	SD 38
Analysis Year	2029	North/South Street	La Mesa
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	1		0	1	0		0	1	0
Configuration		L		TR		L	T	R			LTR				LTR	
Volume (veh/h)		20	480	2		0	165	10		0	10	4		50	2	20
Percent Heavy Vehicles (%)		0				0				0	13	0		0	50	0
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)		4.10				4.10				7.10	6.63	6.20		7.10	7.00	6.20
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)		2.20				2.20				3.50	4.12	3.30		3.50	4.45	3.30

Delay, Queue Length, and Level of Service

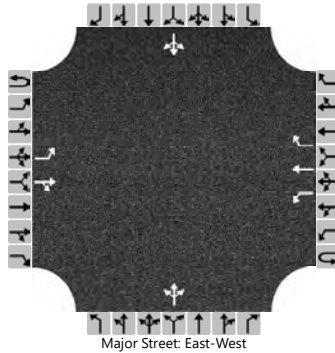
Flow Rate, v (veh/h)		22				0					15				78	
Capacity, c (veh/h)		1396				1053					364				378	
v/c Ratio		0.02				0.00					0.04				0.21	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.1				0.8	
Control Delay (s/veh)		7.6				8.4					15.3				17.0	
Level of Service (LOS)		A				A					C				C	
Approach Delay (s/veh)	0.3				0.0				15.3				17.0			
Approach LOS	A				A				C				C			

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & La Mesa
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/5/2023	East/West Street	SD 38
Analysis Year	2029	North/South Street	La Mesa
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	1		0	1	0		0	1	0
Configuration		L		TR		L	T	R			LTR				LTR	
Volume (veh/h)		15	225	0		6	505	70		2	4	0		55	10	20
Percent Heavy Vehicles (%)		0				0				0	0	0		9	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized					No											
Median Type Storage	Undivided															

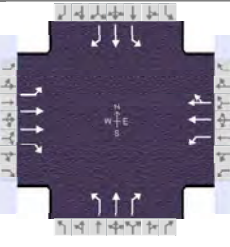
Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.10				4.10				7.10	6.50	6.20		7.19	6.50	6.20
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)		2.20				2.20				3.50	4.00	3.30		3.58	4.00	3.30

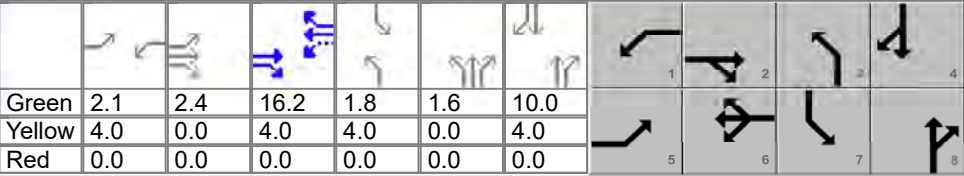
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		16				7					7				92	
Capacity, c (veh/h)		966				1333					265				307	
v/c Ratio		0.02				0.00					0.02				0.30	
95% Queue Length, Q ₉₅ (veh)		0.1				0.0					0.1				1.2	
Control Delay (s/veh)		8.8				7.7					18.9				21.7	
Level of Service (LOS)		A				A					C				C	
Approach Delay (s/veh)	0.5				0.1				18.9				21.7			
Approach LOS	A				A				C				C			

HCS Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	HRG			Duration, h	0.250	
Analyst	NM	Analysis Date	May 5, 2023	Area Type	Other	
Jurisdiction	SDDOT	Time Period	AM Peak	PHF	0.92	
Urban Street	SD 38	Analysis Year	2029	Analysis Period	1> 7:15	
Intersection	SD 38 & Marion Street	File Name	(18) SD38&Marion_AM.xus			
Project Description						

Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	110	240	70	35	90	50	75	155	80	30	100	25

Signal Information											
Cycle, s	50.0	Reference Phase	2								
Offset, s	0	Reference Point	End								
Uncoordinated	No	Simult. Gap E/W	On								
Force Mode	Fixed	Simult. Gap N/S	On	Green	2.1	2.4	16.2	1.8	1.6	10.0	
				Yellow	4.0	0.0	4.0	4.0	0.0	4.0	
				Red	0.0	0.0	0.0	0.0	0.0	0.0	

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	2.0	3.0	1.1	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	8.4	22.6	6.1	20.2	7.4	15.5	5.8	14.0
Change Period, ($Y+R_c$), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Allow Headway (MAH), s	2.9	0.0	2.9	0.0	2.9	2.9	2.9	2.9
Queue Clearance Time (g_s), s	5.4		2.7		4.4	6.3	3.0	4.6
Green Extension Time (g_e), s	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.4
Phase Call Probability	0.81		0.41		0.68	1.00	0.36	1.00
Max Out Probability	0.71		0.00		1.00	0.02	1.00	0.02

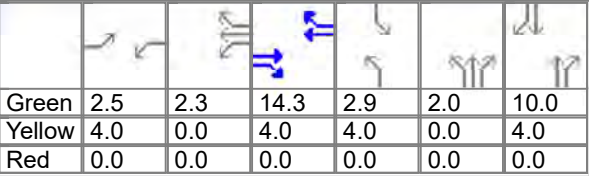
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	120	261	76	38	77	75	82	168	87	33	109	27
Adjusted Saturation Flow Rate (s), veh/h/ln	1701	1674	1525	1714	1772	1567	1647	1674	1502	1554	1758	1466
Queue Service Time (g_s), s	3.4	2.7	1.6	0.7	1.5	1.7	2.4	4.3	2.4	1.0	2.6	0.8
Cycle Queue Clearance Time (g_c), s	3.4	2.7	1.6	0.7	1.5	1.7	2.4	4.3	2.4	1.0	2.6	0.8
Green Ratio (g/C)	0.09	0.37	0.37	0.36	0.32	0.32	0.07	0.23	0.23	0.04	0.20	0.20
Capacity (c), veh/h	151	1244	567	531	574	507	112	386	347	57	351	292
Volume-to-Capacity Ratio (X)	0.791	0.210	0.134	0.072	0.135	0.147	0.730	0.436	0.251	0.576	0.310	0.093
Back of Queue (Q), ft/ln (95 th percentile)	56.9	33.9	20.4	8.5	23.5	26	40.9	61.8	28.7	18.1	38.7	9.4
Back of Queue (Q), veh/ln (95 th percentile)	2.3	1.3	0.8	0.3	0.9	0.9	1.6	2.3	1.1	0.7	1.5	0.4
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	22.3	10.7	10.4	10.4	12.0	12.0	22.9	16.4	15.7	23.7	17.1	16.3
Incremental Delay (d_2), s/veh	3.5	0.4	0.5	0.0	0.5	0.6	3.4	0.3	0.1	3.4	0.2	0.1
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	25.8	11.1	10.9	10.4	12.4	12.6	26.3	16.7	15.8	27.1	17.3	16.4
Level of Service (LOS)	C	B	B	B	B	B	C	B	B	C	B	B
Approach Delay, s/veh / LOS	14.9	B		12.1	B		18.8	B		19.0	B	
Intersection Delay, s/veh / LOS	16.2						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.08	B	2.09	B	2.27	B	2.42	B
Bicycle LOS Score / LOS	0.86	A	0.64	A	1.04	A	0.77	A

HCS Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	HRG			Duration, h	0.250	
Analyst	NM	Analysis Date	May 5, 2023	Area Type	Other	
Jurisdiction	SDDOT	Time Period	PM Peak	PHF	0.90	
Urban Street	SD 38	Analysis Year	2029	Analysis Period	1> 16:45	
Intersection	SD 38 & Marion Street	File Name	(18) SD38&Marion_PM.xus			
Project Description						

Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	45	160	70	115	250	40	120	140	85	55	240	140

Signal Information											
Cycle, s	50.0	Reference Phase	2		Green	2.5	2.3	14.3	2.9	2.0	10.0
Offset, s	0	Reference Point	End								
Uncoordinated	No	Simult. Gap E/W	On								
Force Mode	Fixed	Simult. Gap N/S	On								
				Yellow	4.0	0.0	4.0	4.0	0.0	4.0	
				Red	0.0	0.0	0.0	0.0	0.0	0.0	

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0
Phase Duration, s	6.5	18.3	8.8	20.6	8.9	16.0	6.9	14.0
Change Period, ($Y+R_c$), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Allow Headway (MAH), s	2.9	0.0	2.9	0.0	2.9	3.0	2.9	3.0
Queue Clearance Time (g_s), s	3.7		5.7		5.8	5.7	3.8	9.1
Green Extension Time (g_e), s	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.4
Phase Call Probability	0.50		0.83		0.84	1.00	0.57	1.00
Max Out Probability	0.41		1.00		1.00	0.07	1.00	1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	50	178	78	128	278	44	133	156	94	61	267	156
Adjusted Saturation Flow Rate (s), veh/h/ln	1474	1660	1490	1688	1772	1406	1714	1772	1478	1688	1772	1478
Queue Service Time (g_s), s	1.7	2.0	2.0	3.7	6.2	1.1	3.8	3.7	2.6	1.8	7.1	4.7
Cycle Queue Clearance Time (g_c), s	1.7	2.0	2.0	3.7	6.2	1.1	3.8	3.7	2.6	1.8	7.1	4.7
Green Ratio (g/C)	0.05	0.29	0.29	0.10	0.33	0.33	0.10	0.24	0.24	0.06	0.20	0.20
Capacity (c), veh/h	74	953	428	161	588	467	168	426	356	97	354	296
Volume-to-Capacity Ratio (X)	0.678	0.187	0.182	0.796	0.472	0.095	0.795	0.365	0.266	0.633	0.753	0.526
Back of Queue (Q), ft/ln (95 th percentile)	28.6	28.3	27.3	65.8	99.2	14.3	89.7	52	31.3	29.5	125.7	59.5
Back of Queue (Q), veh/ln (95 th percentile)	1.0	1.1	1.1	2.6	3.9	0.5	3.6	2.0	1.2	1.2	4.9	2.3
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	23.4	13.4	13.4	22.1	13.2	11.5	22.1	15.8	15.4	23.1	18.8	17.9
Incremental Delay (d_2), s/veh	4.0	0.4	0.9	5.8	2.7	0.4	16.3	0.2	0.1	2.5	5.2	0.5
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	27.4	13.9	14.3	27.9	15.9	11.9	38.3	16.0	15.5	25.6	24.0	18.4
Level of Service (LOS)	C	B	B	C	B	B	D	B	B	C	C	B
Approach Delay, s/veh / LOS	16.2	B		18.9	B		23.7	C		22.4	C	
Intersection Delay, s/veh / LOS	20.6						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.09	B	2.09	B	2.26	B	2.27	B
Bicycle LOS Score / LOS	0.74	A	1.23	A	1.12	A	1.29	A

HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	3/15/2023
Agency	HRG	Analysis Year	2050 NB
Jurisdiction	SDDOT	Time Analyzed	AM PEAK
Project Description	EB SD38 Corridor Study	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1084
Measured FFS	Measured	Free-Flow Speed, mi/h	55.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	405	Opposing Demand Flow Rate, veh/h	245
Peak Hour Factor	0.88	Total Trucks, %	2.16
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.24

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.0
Speed Slope Coefficient (m)	4.33465	Speed Power Coefficient (p)	0.52741
PF Slope Coefficient (m)	-1.33665	PF Power Coefficient (p)	0.76555
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.7
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1084	-	-	52.7

Vehicle Results

Average Speed, mi/h	52.7	Percent Followers, %	48.8
Segment Travel Time, minutes	0.23	Follower Density (FD), followers/mi/ln	3.7
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	405	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.75	Bicycle Effective Speed Factor	4.62
Bicycle LOS	C		

Segment 2

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	507
Measured FFS	Measured	Free-Flow Speed, mi/h	55.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		405	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.16
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.24
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		55.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.43973	PF Power Coefficient (p)		0.72475
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		4.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	507	-	-	52.2
Vehicle Results					
Average Speed, mi/h		52.2	Percent Followers, %		52.6
Segment Travel Time, minutes		0.11	Follower Density (FD), followers/mi/ln		4.1
Vehicle LOS		C			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		405	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.75	Bicycle Effective Speed Factor		4.62
Bicycle LOS		C			
Segment 3					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		535
Measured FFS		Measured	Free-Flow Speed, mi/h		55.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		405	Opposing Demand Flow Rate, veh/h		245
Peak Hour Factor		0.88	Total Trucks, %		2.16
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.24
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		55.0
Speed Slope Coefficient (m)		4.33465	Speed Power Coefficient (p)		0.52741
PF Slope Coefficient (m)		-1.33665	PF Power Coefficient (p)		0.76555
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		3.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	535	-	-	52.7

Vehicle Results

Average Speed, mi/h	52.7	Percent Followers, %	48.8
Segment Travel Time, minutes	0.12	Follower Density (FD), followers/mi/ln	3.7
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	405	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.75	Bicycle Effective Speed Factor	4.62
Bicycle LOS	C		

Segment 4

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1494
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	483	Opposing Demand Flow Rate, veh/h	256
Peak Hour Factor	0.88	Total Trucks, %	1.63
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.28

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.34129	Speed Power Coefficient (p)	0.52497
PF Slope Coefficient (m)	-1.24091	PF Power Coefficient (p)	0.80645
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.6
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1494	-	-	67.4

Vehicle Results

Average Speed, mi/h	67.4	Percent Followers, %	49.8
Segment Travel Time, minutes	0.25	Follower Density (FD), followers/mi/ln	3.6
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	483	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.84	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		5762
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		483	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		1.63
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.28
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.62977	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.20069	PF Power Coefficient (p)		0.78591
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		3.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5762	-	-	66.9
Vehicle Results					
Average Speed, mi/h		66.9	Percent Followers, %		49.2
Segment Travel Time, minutes		0.98	Follower Density (FD), followers/mi/ln		3.6
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		483	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.84	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		383
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		488	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		1.89
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.29
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29361	PF Power Coefficient (p)	0.75772
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.8
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	383	-	-	66.9

Vehicle Results			
Average Speed, mi/h	66.9	Percent Followers, %	52.8
Segment Travel Time, minutes	0.07	Follower Density (FD), followers/mi/ln	3.8
Vehicle LOS	B		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	488	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.91	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 7

Vehicle Inputs			
Segment Type	Passing Constrained	Length, ft	1485
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	505	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	3.19
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.30

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57684	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.28453	PF Power Coefficient (p)	0.76145
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1485	-	-	66.9

Vehicle Results			
Average Speed, mi/h	66.9	Percent Followers, %	53.4
Segment Travel Time, minutes	0.25	Follower Density (FD), followers/mi/ln	4.0
Vehicle LOS	C		

Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		505	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.27	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 8					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		426
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		231	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		6.47
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.14
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29307	PF Power Coefficient (p)		0.75839
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	426	-	-	68.0
Vehicle Results					
Average Speed, mi/h		68.0	Percent Followers, %		34.6
Segment Travel Time, minutes		0.07	Follower Density (FD), followers/mi/ln		1.2
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		231	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.91	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 9					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1212
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					

Directional Demand Flow Rate, veh/h		242	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.14
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29321	PF Power Coefficient (p)		0.75821
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1212	-	-	68.0
Vehicle Results					
Average Speed, mi/h		68.0	Percent Followers, %		35.7
Segment Travel Time, minutes		0.20	Follower Density (FD), followers/mi/ln		1.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		242	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.53	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1877
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		242	Opposing Demand Flow Rate, veh/h		172
Peak Hour Factor		0.88	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.14
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.31794	Speed Power Coefficient (p)		0.54766
PF Slope Coefficient (m)		-1.20625	PF Power Coefficient (p)		0.82046
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	1877	-	-	68.5
Vehicle Results					
Average Speed, mi/h		68.5	Percent Followers, %		31.4
Segment Travel Time, minutes		0.31	Follower Density (FD), followers/mi/ln		1.1
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		242	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.53	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1872
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		242	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.14
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.58354	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.26676	PF Power Coefficient (p)		0.76864
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1872	-	-	68.0
Vehicle Results					
Average Speed, mi/h		68.0	Percent Followers, %		34.7
Segment Travel Time, minutes		0.31	Follower Density (FD), followers/mi/ln		1.2
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		242	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.53	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 12					

Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		3603
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		242	Opposing Demand Flow Rate, veh/h		172
Peak Hour Factor		0.88	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.14
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.34159	Speed Power Coefficient (p)		0.54766
PF Slope Coefficient (m)		-1.16323	PF Power Coefficient (p)		0.83771
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3603	-	-	68.5
Vehicle Results					
Average Speed, mi/h		68.5	Percent Followers, %		29.8
Segment Travel Time, minutes		0.60	Follower Density (FD), followers/mi/ln		1.1
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		242	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.53	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1053
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		242	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.14
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29321	PF Power Coefficient (p)		0.75821

In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1053	-	-	68.0
Vehicle Results					
Average Speed, mi/h		68.0	Percent Followers, %		35.7
Segment Travel Time, minutes		0.18	Follower Density (FD), followers/mi/ln		1.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		242	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.53	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 14					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1120
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		242	Opposing Demand Flow Rate, veh/h		172
Peak Hour Factor		0.88	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.14
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.30804	Speed Power Coefficient (p)		0.54766
PF Slope Coefficient (m)		-1.23154	PF Power Coefficient (p)		0.80916
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1120	-	-	68.5
Vehicle Results					
Average Speed, mi/h		68.5	Percent Followers, %		32.3
Segment Travel Time, minutes		0.19	Follower Density (FD), followers/mi/ln		1.1
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4

Flow Rate Outside Lane, veh/h	242	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.53	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 15

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1272
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	278	Opposing Demand Flow Rate, veh/h	188
Peak Hour Factor	0.88	Total Trucks, %	5.09
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.16

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.31419	Speed Power Coefficient (p)	0.54284
PF Slope Coefficient (m)	-1.23547	PF Power Coefficient (p)	0.80786
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.5
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1272	-	-	68.3

Vehicle Results

Average Speed, mi/h	68.3	Percent Followers, %	35.6
Segment Travel Time, minutes	0.21	Follower Density (FD), followers/mi/ln	1.5
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	278	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.54	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 16

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	625
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	278	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	5.09
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.16

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29323	PF Power Coefficient (p)	0.75819
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.6
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	625	-	-	67.8

Vehicle Results			
Average Speed, mi/h	67.8	Percent Followers, %	38.8
Segment Travel Time, minutes	0.10	Follower Density (FD), followers/mi/ln	1.6
Vehicle LOS	A		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	278	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.54	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 17

Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	1995
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	278	Opposing Demand Flow Rate, veh/h	188
Peak Hour Factor	0.88	Total Trucks, %	5.09
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.16

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.32599	Speed Power Coefficient (p)	0.54284
PF Slope Coefficient (m)	-1.20573	PF Power Coefficient (p)	0.82101
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.4
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1995	-	-	68.3

Vehicle Results			
Average Speed, mi/h	68.3	Percent Followers, %	34.4

Segment Travel Time, minutes		0.33	Follower Density (FD), followers/mi/ln		1.4
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		278	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.54	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 18					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1399
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		278	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		5.09
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.16
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57524	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.28884	PF Power Coefficient (p)		0.75993
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1399	-	-	67.8
Vehicle Results					
Average Speed, mi/h		67.8	Percent Followers, %		38.6
Segment Travel Time, minutes		0.23	Follower Density (FD), followers/mi/ln		1.6
Vehicle LOS		A			

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	278	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.54	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		
Segment 19			
Vehicle Inputs			
Segment Type	Passing Constrained	Length, ft	1254
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		516	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		1.51
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.30
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29366	PF Power Coefficient (p)		0.75766
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		4.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1254	-	-	66.8
Vehicle Results					
Average Speed, mi/h		66.8	Percent Followers, %		54.3
Segment Travel Time, minutes		0.21	Follower Density (FD), followers/mi/ln		4.2
Vehicle LOS		C			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		516	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.84	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 20					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1108
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		516	Opposing Demand Flow Rate, veh/h		177
Peak Hour Factor		0.88	Total Trucks, %		1.51
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.30
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.31027	Speed Power Coefficient (p)		0.54591
PF Slope Coefficient (m)		-1.23339	PF Power Coefficient (p)		0.80813
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		3.9
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1108	-	-	67.3

Vehicle Results

Average Speed, mi/h	67.3	Percent Followers, %	51.4
Segment Travel Time, minutes	0.19	Follower Density (FD), followers/mi/ln	3.9
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	516	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.84	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 21

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	2901
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	516	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	1.51
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.30

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.59854	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.23554	PF Power Coefficient (p)	0.77974
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2901	-	-	66.8

Vehicle Results

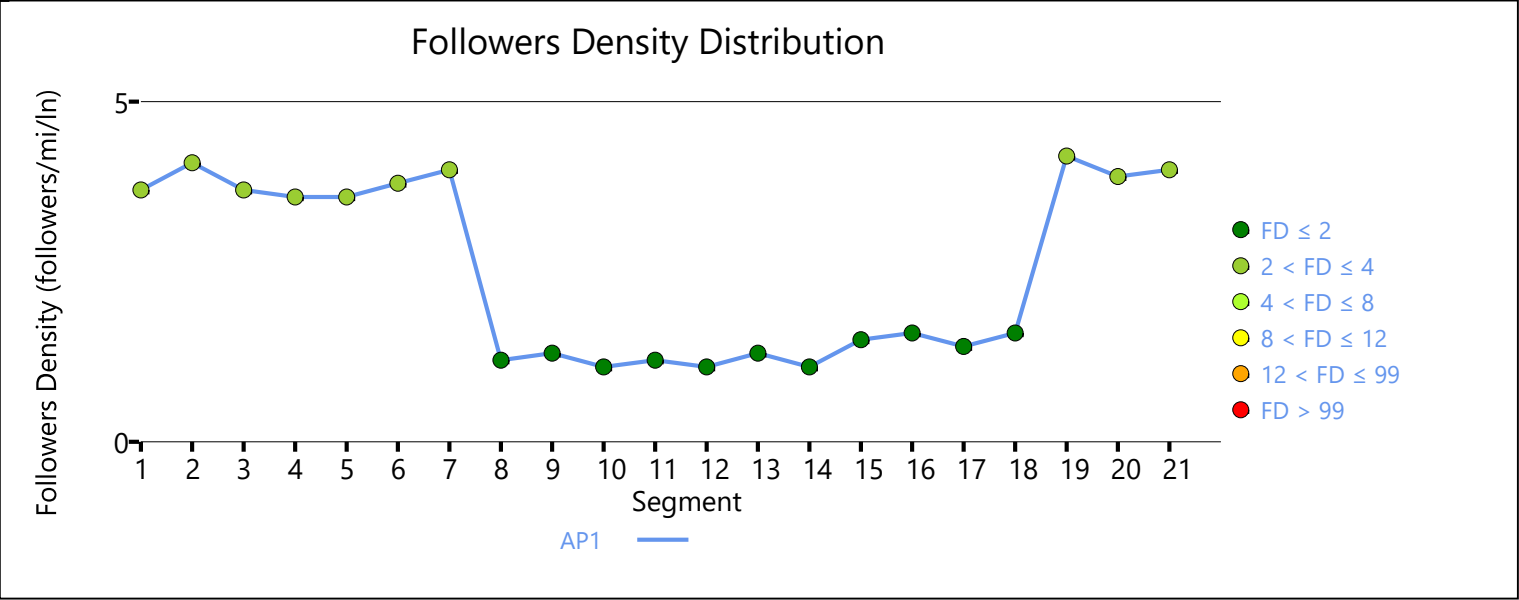
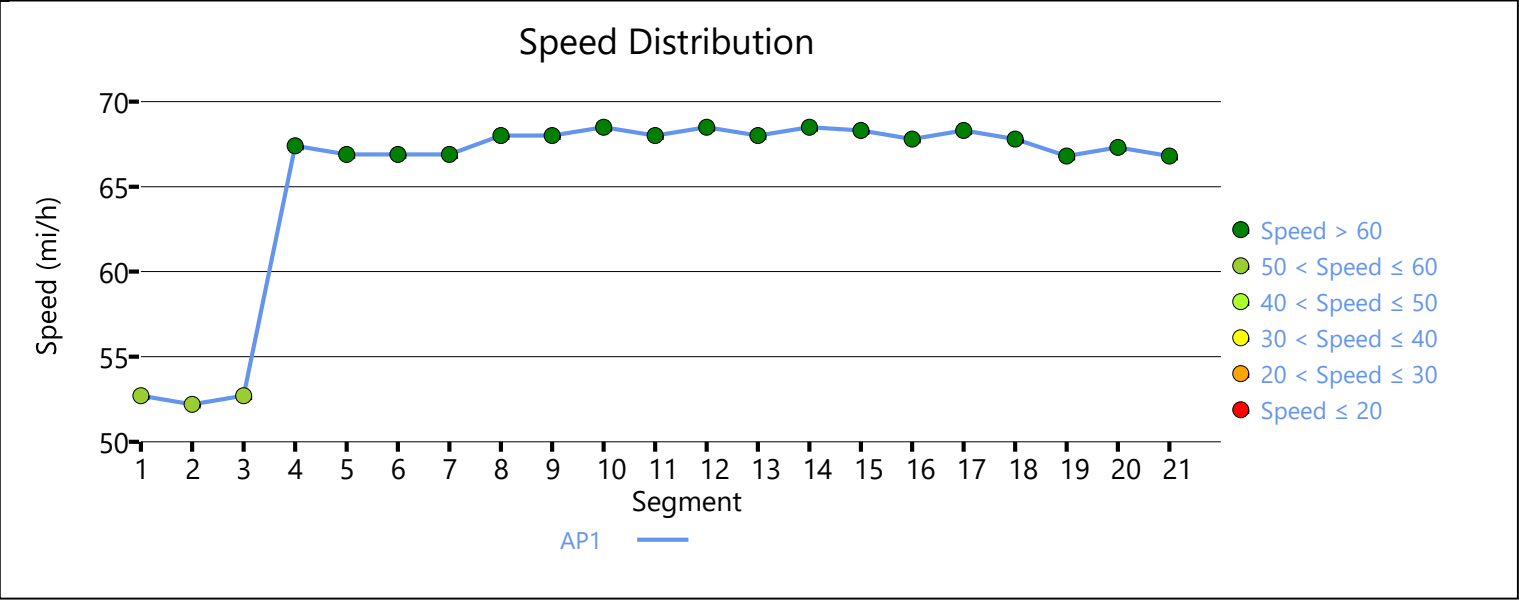
Average Speed, mi/h	66.8	Percent Followers, %	52.2
Segment Travel Time, minutes	0.49	Follower Density (FD), followers/mi/ln	4.0
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	516	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.84	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Facility Results

T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	508	0.29	2.5	B



HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	5/11/2023
Agency	HRG	Analysis Year	2029 NB
Jurisdiction	SDDOT	Time Analyzed	PM PEAK
Project Description	EB SD38 Corridor Study	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1084
Measured FFS	Measured	Free-Flow Speed, mi/h	55.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	249	Opposing Demand Flow Rate, veh/h	457
Peak Hour Factor	0.90	Total Trucks, %	2.16
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.15

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.0
Speed Slope Coefficient (m)	4.39377	Speed Power Coefficient (p)	0.48810
PF Slope Coefficient (m)	-1.37630	PF Power Coefficient (p)	0.75567
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.8
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1084	-	-	53.3

Vehicle Results

Average Speed, mi/h	53.3	Percent Followers, %	38.2
Segment Travel Time, minutes	0.23	Follower Density (FD), followers/mi/ln	1.8
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	249	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.50	Bicycle Effective Speed Factor	4.62
Bicycle LOS	B		

Segment 2

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1014
Measured FFS	Measured	Free-Flow Speed, mi/h	55.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		249	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		2.16
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		55.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.43973	PF Power Coefficient (p)		0.72475
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.9
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	507	-	-	52.9
2	Horizontal Curve	507	3000	0.0	52.9
Vehicle Results					
Average Speed, mi/h		52.9	Percent Followers, %		40.9
Segment Travel Time, minutes		0.22	Follower Density (FD), followers/mi/ln		1.9
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		249	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.50	Bicycle Effective Speed Factor		4.62
Bicycle LOS		B			
Segment 3					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		535
Measured FFS		Measured	Free-Flow Speed, mi/h		55.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		249	Opposing Demand Flow Rate, veh/h		457
Peak Hour Factor		0.90	Total Trucks, %		2.16
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		55.0
Speed Slope Coefficient (m)		4.39377	Speed Power Coefficient (p)		0.48810
PF Slope Coefficient (m)		-1.37630	PF Power Coefficient (p)		0.75567
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.8
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	535	-	-	53.3

Vehicle Results			
Average Speed, mi/h	53.3	Percent Followers, %	38.2
Segment Travel Time, minutes	0.11	Follower Density (FD), followers/mi/ln	1.8
Vehicle LOS	A		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	249	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.50	Bicycle Effective Speed Factor	4.62
Bicycle LOS	B		

Segment 4			
Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	1494
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	259	Opposing Demand Flow Rate, veh/h	574
Peak Hour Factor	0.90	Total Trucks, %	1.63
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.15

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.42398	Speed Power Coefficient (p)	0.47280
PF Slope Coefficient (m)	-1.27644	PF Power Coefficient (p)	0.79034
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1494	-	-	68.1

Vehicle Results			
Average Speed, mi/h	68.1	Percent Followers, %	35.5
Segment Travel Time, minutes	0.25	Follower Density (FD), followers/mi/ln	1.3
Vehicle LOS	A		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	259	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.52	Bicycle Effective Speed Factor	5.07

Bicycle LOS		C			
Segment 5					
Vehicle Inputs					
Segment Type		Passing Constrained		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				5762	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		259		Opposing Demand Flow Rate, veh/h	
				-	
Peak Hour Factor		0.90		Total Trucks, %	
				1.63	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.15	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
				70.0	
Speed Slope Coefficient (m)		4.62977		Speed Power Coefficient (p)	
				0.41674	
PF Slope Coefficient (m)		-1.20069		PF Power Coefficient (p)	
				0.78591	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln	
				1.3	
%Improvement to Percent Followers		0.0		%Improvement to Speed	
				0.0	
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5762	-	-	67.8
Vehicle Results					
Average Speed, mi/h		67.8		Percent Followers, %	
				34.0	
Segment Travel Time, minutes		0.97		Follower Density (FD), followers/mi/ln	
				1.3	
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0		Pavement Condition Rating	
				4	
Flow Rate Outside Lane, veh/h		259		Bicycle Effective Width, ft	
				24	
Bicycle LOS Score		2.52		Bicycle Effective Speed Factor	
				5.07	
Bicycle LOS		C			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained		Length, ft	
				383	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		262		Opposing Demand Flow Rate, veh/h	
				-	
Peak Hour Factor		0.90		Total Trucks, %	
				1.89	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.15	
Intermediate Results					

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29361	PF Power Coefficient (p)	0.75772
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.4
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	383	-	-	67.9

Vehicle Results

Average Speed, mi/h	67.9	Percent Followers, %	37.4
Segment Travel Time, minutes	0.06	Follower Density (FD), followers/mi/ln	1.4
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	262	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.59	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 7

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1485
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	288	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	3.19
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.17

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57684	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.28453	PF Power Coefficient (p)	0.76145
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.7
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1485	-	-	67.7

Vehicle Results

Average Speed, mi/h	67.7	Percent Followers, %	39.2
Segment Travel Time, minutes	0.25	Follower Density (FD), followers/mi/ln	1.7

Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0		Pavement Condition Rating	
Flow Rate Outside Lane, veh/h		288		Bicycle Effective Width, ft	
Bicycle LOS Score		2.99		Bicycle Effective Speed Factor	
Bicycle LOS		C			
Segment 8					
Vehicle Inputs					
Segment Type		Passing Constrained		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		214		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.90		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
Speed Slope Coefficient (m)		4.57372		Speed Power Coefficient (p)	
PF Slope Coefficient (m)		-1.29307		PF Power Coefficient (p)	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln	
%Improvement to Percent Followers		0.0		%Improvement to Speed	
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	426	-	-	68.1
Vehicle Results					
Average Speed, mi/h		68.1		Percent Followers, %	
Segment Travel Time, minutes		0.07		Follower Density (FD), followers/mi/ln	
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0		Pavement Condition Rating	
Flow Rate Outside Lane, veh/h		214		Bicycle Effective Width, ft	
Bicycle LOS Score		3.87		Bicycle Effective Speed Factor	
Bicycle LOS		D			
Segment 9					
Vehicle Inputs					
Segment Type		Passing Constrained		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	

Demand and Capacity					
Directional Demand Flow Rate, veh/h		208	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.12
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29321	PF Power Coefficient (p)		0.75821
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.0
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1212	-	-	68.2
Vehicle Results					
Average Speed, mi/h		68.2	Percent Followers, %		32.5
Segment Travel Time, minutes		0.20	Follower Density (FD), followers/mi/ln		1.0
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		208	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.45	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1877
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		208	Opposing Demand Flow Rate, veh/h		281
Peak Hour Factor		0.90	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.12
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.35595	Speed Power Coefficient (p)		0.51922
PF Slope Coefficient (m)		-1.22813	PF Power Coefficient (p)		0.81248
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.9
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1877	-	-	68.6

Vehicle Results

Average Speed, mi/h	68.6	Percent Followers, %	29.0
Segment Travel Time, minutes	0.31	Follower Density (FD), followers/mi/ln	0.9
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	208	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.45	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 11

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1872
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	208	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.90	Total Trucks, %	5.26
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.12

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.58354	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.26676	PF Power Coefficient (p)	0.76864
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1872	-	-	68.2

Vehicle Results

Average Speed, mi/h	68.2	Percent Followers, %	31.5
Segment Travel Time, minutes	0.31	Follower Density (FD), followers/mi/ln	1.0
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	208	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.45	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 12					
Vehicle Inputs					
Segment Type		Passing Zone		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				3603	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		208		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.90		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.12	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
Speed Slope Coefficient (m)		4.37960		Speed Power Coefficient (p)	
PF Slope Coefficient (m)		-1.18421		PF Power Coefficient (p)	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln	
%Improvement to Percent Followers		0.0		%Improvement to Speed	
				0.0	
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3603	-	-	68.6
Vehicle Results					
Average Speed, mi/h		68.6		Percent Followers, %	
Segment Travel Time, minutes		0.60		Follower Density (FD), followers/mi/ln	
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0		Pavement Condition Rating	
Flow Rate Outside Lane, veh/h		208		Bicycle Effective Width, ft	
Bicycle LOS Score		3.45		Bicycle Effective Speed Factor	
Bicycle LOS		C			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Constrained		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				1053	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		208		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.90		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.12	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
				70.0	

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29321	PF Power Coefficient (p)	0.75821
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1053	-	-	68.2

Vehicle Results			
Average Speed, mi/h	68.2	Percent Followers, %	32.5
Segment Travel Time, minutes	0.18	Follower Density (FD), followers/mi/ln	1.0
Vehicle LOS	A		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	208	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.45	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 14

Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	1120
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	208	Opposing Demand Flow Rate, veh/h	281
Peak Hour Factor	0.90	Total Trucks, %	5.26
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.12

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.34605	Speed Power Coefficient (p)	0.51922
PF Slope Coefficient (m)	-1.25395	PF Power Coefficient (p)	0.80148
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.9
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1120	-	-	68.6

Vehicle Results			
Average Speed, mi/h	68.6	Percent Followers, %	29.9
Segment Travel Time, minutes	0.19	Follower Density (FD), followers/mi/ln	0.9
Vehicle LOS	A		

Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		208	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.45	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 15					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1272
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		250	Opposing Demand Flow Rate, veh/h		328
Peak Hour Factor		0.90	Total Trucks, %		5.09
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.35992	Speed Power Coefficient (p)		0.50965
PF Slope Coefficient (m)		-1.26111	PF Power Coefficient (p)		0.79874
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1272	-	-	68.3
Vehicle Results					
Average Speed, mi/h		68.3	Percent Followers, %		34.1
Segment Travel Time, minutes		0.21	Follower Density (FD), followers/mi/ln		1.2
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		250	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.49	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 16					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		625
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					

Directional Demand Flow Rate, veh/h		250	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		5.09
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29323	PF Power Coefficient (p)		0.75819
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	625	-	-	67.9
Vehicle Results					
Average Speed, mi/h		67.9	Percent Followers, %		36.4
Segment Travel Time, minutes		0.10	Follower Density (FD), followers/mi/ln		1.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		250	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.49	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 17					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1995
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		250	Opposing Demand Flow Rate, veh/h		328
Peak Hour Factor		0.90	Total Trucks, %		5.09
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.37172	Speed Power Coefficient (p)		0.50965
PF Slope Coefficient (m)		-1.23065	PF Power Coefficient (p)		0.81147
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	1995	-	-	68.3
Vehicle Results					
Average Speed, mi/h		68.3	Percent Followers, %		32.9
Segment Travel Time, minutes		0.33	Follower Density (FD), followers/mi/ln		1.2
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		250	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.49	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 18					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1399
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		250	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		5.09
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57524	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.28884	PF Power Coefficient (p)		0.75993
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1399	-	-	67.9
Vehicle Results					
Average Speed, mi/h		67.9	Percent Followers, %		36.2
Segment Travel Time, minutes		0.23	Follower Density (FD), followers/mi/ln		1.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		250	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.49	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 19					

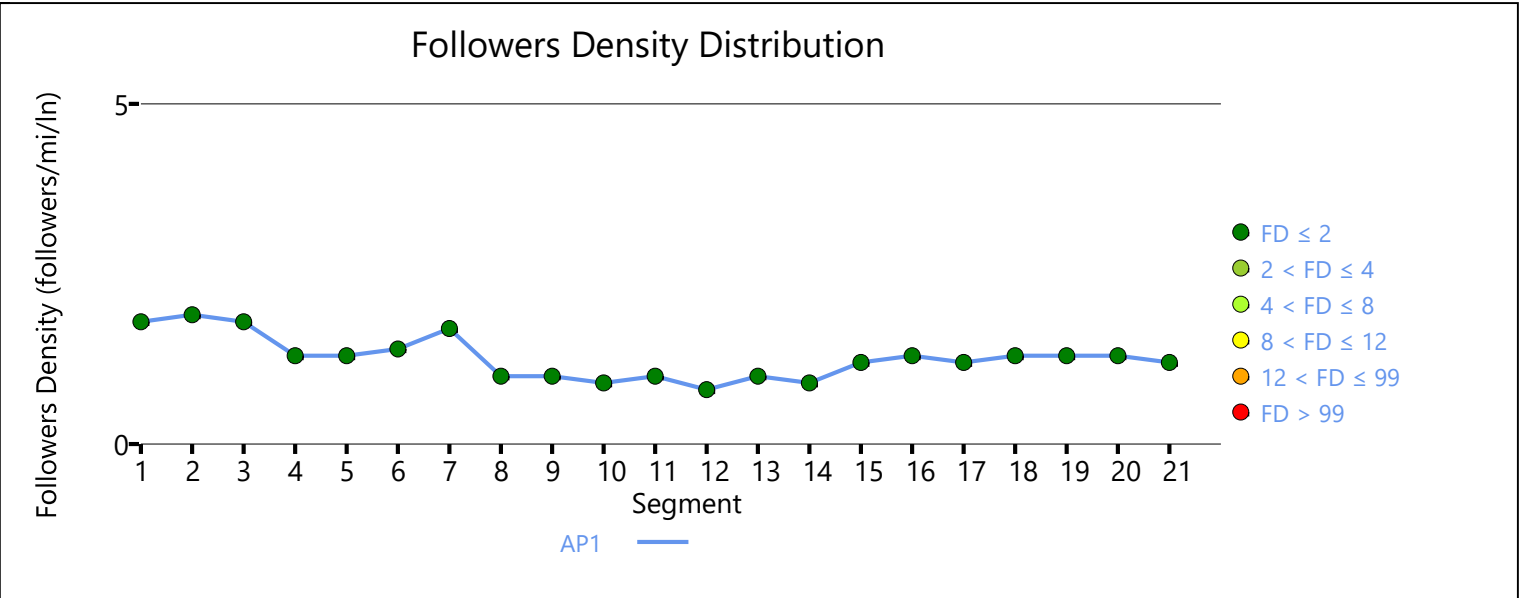
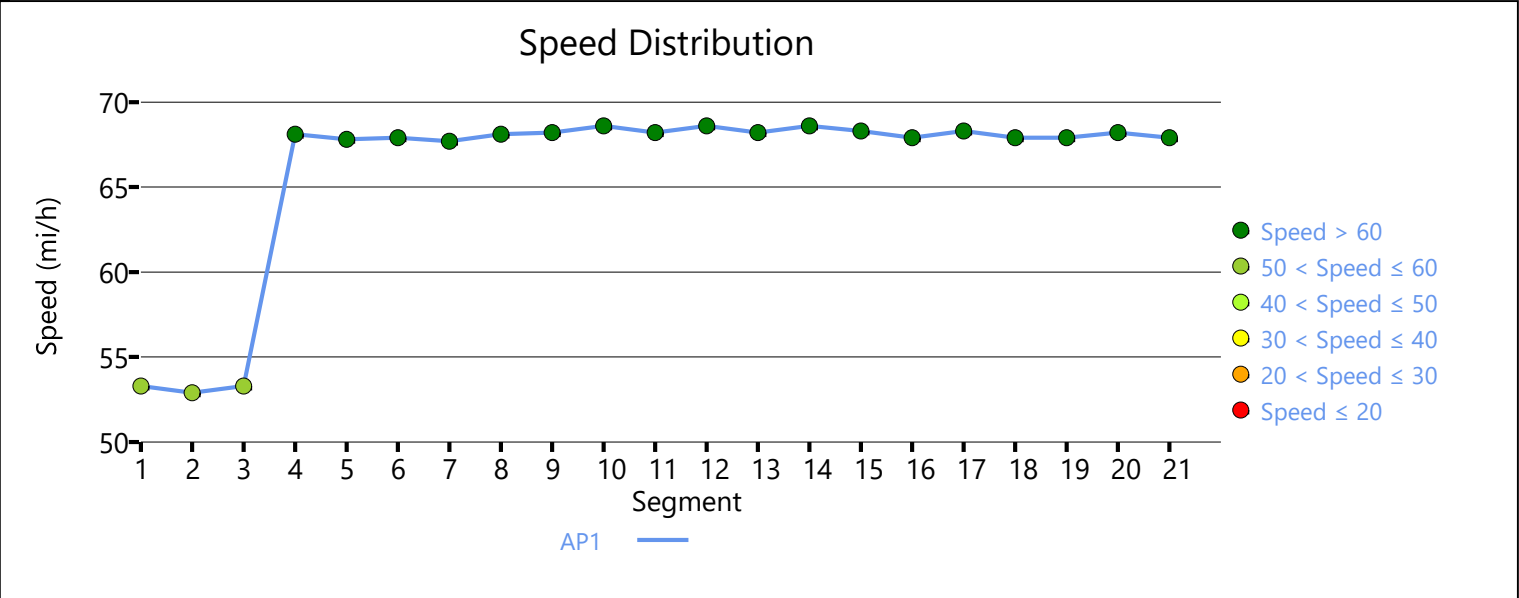
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1254
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		248	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		1.51
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29366	PF Power Coefficient (p)		0.75766
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1254	-	-	67.9
Vehicle Results					
Average Speed, mi/h		67.9	Percent Followers, %		36.2
Segment Travel Time, minutes		0.21	Follower Density (FD), followers/mi/ln		1.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		248	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.47	Bicycle Effective Speed Factor		5.07
Bicycle LOS		B			
Segment 20					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1108
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		248	Opposing Demand Flow Rate, veh/h		522
Peak Hour Factor		0.90	Total Trucks, %		1.51
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.40913	Speed Power Coefficient (p)		0.47917
PF Slope Coefficient (m)		-1.28208	PF Power Coefficient (p)		0.78876

In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1108	-	-	68.2
Vehicle Results					
Average Speed, mi/h		68.2	Percent Followers, %		34.7
Segment Travel Time, minutes		0.18	Follower Density (FD), followers/mi/ln		1.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		248	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.47	Bicycle Effective Speed Factor		5.07
Bicycle LOS		B			
Segment 21					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		2901
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		248	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.90	Total Trucks, %		1.51
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.59854	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.23554	PF Power Coefficient (p)		0.77974
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2901	-	-	67.9
Vehicle Results					
Average Speed, mi/h	67.9	Percent Followers, %	34.1		
Segment Travel Time, minutes	0.49	Follower Density (FD), followers/mi/ln	1.2		
Vehicle LOS	A				
Bicycle Results					
Percent Occupied Parking	0	Pavement Condition Rating	4		

Flow Rate Outside Lane, veh/h	248	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.47	Bicycle Effective Speed Factor	5.07
Bicycle LOS	B		

Facility Results				
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	341	0.14	1.2	A



HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	5/11/2023
Agency	HRG	Analysis Year	2029 NB
Jurisdiction	SDDOT	Time Analyzed	AM Peak
Project Description	SD 38 WB East of Hartford	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1727
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	177	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	8.97
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.10

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.58112	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.27241	PF Power Coefficient (p)	0.76681
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.7
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1727	-	-	68.4

Vehicle Results

Average Speed, mi/h	68.4	Percent Followers, %	28.7
Segment Travel Time, minutes	0.29	Follower Density (FD), followers/mi/ln	0.7
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	177	Bicycle Effective Width, ft	28
Bicycle LOS Score	3.69	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 2

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1676
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		177	Opposing Demand Flow Rate, veh/h		516
Peak Hour Factor		0.88	Total Trucks, %		8.97
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.41422	Speed Power Coefficient (p)		0.47998
PF Slope Coefficient (m)		-1.26276	PF Power Coefficient (p)		0.79739
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1676	-	-	68.7
Vehicle Results					
Average Speed, mi/h		68.7	Percent Followers, %		27.2
Segment Travel Time, minutes		0.28	Follower Density (FD), followers/mi/ln		0.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		177	Bicycle Effective Width, ft		28
Bicycle LOS Score		3.69	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 3					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1864
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		188	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		17.04
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.11
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.58341	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.26572	PF Power Coefficient (p)		0.77025
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.8
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1864	-	-	68.3

Vehicle Results

Average Speed, mi/h	68.3	Percent Followers, %	29.4
Segment Travel Time, minutes	0.31	Follower Density (FD), followers/mi/ln	0.8
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	188	Bicycle Effective Width, ft	24
Bicycle LOS Score	8.75	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 4

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	718
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	188	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	17.04
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.11

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29182	PF Power Coefficient (p)	0.75993
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.8
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	718	-	-	68.3

Vehicle Results

Average Speed, mi/h	68.3	Percent Followers, %	30.4
Segment Travel Time, minutes	0.12	Follower Density (FD), followers/mi/ln	0.8
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	188	Bicycle Effective Width, ft	24
Bicycle LOS Score	8.75	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1738
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		188	Opposing Demand Flow Rate, veh/h		278
Peak Hour Factor		0.88	Total Trucks, %		17.04
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.11
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.35280	Speed Power Coefficient (p)		0.51981
PF Slope Coefficient (m)		-1.23200	PF Power Coefficient (p)		0.81205
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1738	-	-	68.8
Vehicle Results					
Average Speed, mi/h		68.8	Percent Followers, %		27.1
Segment Travel Time, minutes		0.29	Follower Density (FD), followers/mi/ln		0.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		188	Bicycle Effective Width, ft		24
Bicycle LOS Score		8.75	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		579
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		188	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		17.04
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.11
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29182	PF Power Coefficient (p)	0.75993
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.8
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	579	-	-	68.3

Vehicle Results			
Average Speed, mi/h	68.3	Percent Followers, %	30.4
Segment Travel Time, minutes	0.10	Follower Density (FD), followers/mi/ln	0.8
Vehicle LOS	A		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	188	Bicycle Effective Width, ft	24
Bicycle LOS Score	8.75	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 7

Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	2262
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	172	Opposing Demand Flow Rate, veh/h	242
Peak Hour Factor	0.88	Total Trucks, %	18.44
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.10

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.34942	Speed Power Coefficient (p)	0.52824
PF Slope Coefficient (m)	-1.20658	PF Power Coefficient (p)	0.82267
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.6
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2262	-	-	68.9

Vehicle Results			
Average Speed, mi/h	68.9	Percent Followers, %	24.6
Segment Travel Time, minutes	0.37	Follower Density (FD), followers/mi/ln	0.6
Vehicle LOS	A		

Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		172	Bicycle Effective Width, ft		28
Bicycle LOS Score		8.50	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 8					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		980
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		172	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29166	PF Power Coefficient (p)		0.76014
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	980	-	-	68.5
Vehicle Results					
Average Speed, mi/h		68.5	Percent Followers, %		28.7
Segment Travel Time, minutes		0.16	Follower Density (FD), followers/mi/ln		0.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		172	Bicycle Effective Width, ft		28
Bicycle LOS Score		8.50	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 9					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		3667
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					

Directional Demand Flow Rate, veh/h		172	Opposing Demand Flow Rate, veh/h		242
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.36783	Speed Power Coefficient (p)		0.52824
PF Slope Coefficient (m)		-1.17532	PF Power Coefficient (p)		0.83427
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3667	-	-	68.9
Vehicle Results					
Average Speed, mi/h		68.9	Percent Followers, %		23.7
Segment Travel Time, minutes		0.60	Follower Density (FD), followers/mi/ln		0.6
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		172	Bicycle Effective Width, ft		28
Bicycle LOS Score		8.50	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1846
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		172	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.58311	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.26629	PF Power Coefficient (p)		0.77017
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	1846	-	-	68.5
Vehicle Results					
Average Speed, mi/h		68.5	Percent Followers, %		27.8
Segment Travel Time, minutes		0.31	Follower Density (FD), followers/mi/ln		0.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		172	Bicycle Effective Width, ft		28
Bicycle LOS Score		8.50	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		2174
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		172	Opposing Demand Flow Rate, veh/h		242
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.34810	Speed Power Coefficient (p)		0.52824
PF Slope Coefficient (m)		-1.20938	PF Power Coefficient (p)		0.82151
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2174	-	-	68.9
Vehicle Results					
Average Speed, mi/h		68.9	Percent Followers, %		24.7
Segment Travel Time, minutes		0.36	Follower Density (FD), followers/mi/ln		0.6
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		172	Bicycle Effective Width, ft		28
Bicycle LOS Score		8.50	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 12					

Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1277
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		172	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29166	PF Power Coefficient (p)		0.76014
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1277	-	-	68.5
Vehicle Results					
Average Speed, mi/h		68.5	Percent Followers, %		28.7
Segment Travel Time, minutes		0.21	Follower Density (FD), followers/mi/ln		0.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		172	Bicycle Effective Width, ft		28
Bicycle LOS Score		8.50	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		779
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		172	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29166	PF Power Coefficient (p)		0.76014

In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	779	-	-	68.5
Vehicle Results					
Average Speed, mi/h		68.5	Percent Followers, %		28.7
Segment Travel Time, minutes		0.13	Follower Density (FD), followers/mi/ln		0.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		172	Bicycle Effective Width, ft		28
Bicycle LOS Score		8.50	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 14					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		422
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		192	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		13.95
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.11
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29219	PF Power Coefficient (p)		0.75948
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.9
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	422	-	-	68.3
Vehicle Results					
Average Speed, mi/h		68.3	Percent Followers, %		30.9
Segment Travel Time, minutes		0.07	Follower Density (FD), followers/mi/ln		0.9
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4

Flow Rate Outside Lane, veh/h	192	Bicycle Effective Width, ft	24
Bicycle LOS Score	7.06	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 15

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1478
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	177	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	19.53
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.10

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57671	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.28298	PF Power Coefficient (p)	0.76370
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.8
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1478	-	-	68.4

Vehicle Results

Average Speed, mi/h	68.4	Percent Followers, %	29.0
Segment Travel Time, minutes	0.25	Follower Density (FD), followers/mi/ln	0.8
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	177	Bicycle Effective Width, ft	28
Bicycle LOS Score	9.19	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 16

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	384
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	265	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	12.76
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.16

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29233	PF Power Coefficient (p)	0.75931
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.5
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	384	-	-	67.8

Vehicle Results			
Average Speed, mi/h	67.8	Percent Followers, %	37.6
Segment Travel Time, minutes	0.06	Follower Density (FD), followers/mi/ln	1.5
Vehicle LOS	A		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	265	Bicycle Effective Width, ft	24
Bicycle LOS Score	6.63	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 17

Vehicle Inputs			
Segment Type	Passing Constrained	Length, ft	3732
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	256	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	12.21
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.15

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.60878	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.21846	PF Power Coefficient (p)	0.78615
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3732	-	-	67.9

Vehicle Results			
Average Speed, mi/h	67.9	Percent Followers, %	34.1

Segment Travel Time, minutes		0.62	Follower Density (FD), followers/mi/ln		1.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		256	Bicycle Effective Width, ft		24
Bicycle LOS Score		6.34	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 18					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1360
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		256	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		12.21
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57450	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29014	PF Power Coefficient (p)		0.76012
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1360	-	-	67.9
Vehicle Results					
Average Speed, mi/h		67.9	Percent Followers, %		36.7
Segment Travel Time, minutes		0.23	Follower Density (FD), followers/mi/ln		1.4
Vehicle LOS		A			

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	256	Bicycle Effective Width, ft	24
Bicycle LOS Score	6.34	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		
Segment 19			
Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	1595
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		256	Opposing Demand Flow Rate, veh/h		483
Peak Hour Factor		0.88	Total Trucks, %		12.21
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.40516	Speed Power Coefficient (p)		0.48439
PF Slope Coefficient (m)		-1.26342	PF Power Coefficient (p)		0.79785
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1595	-	-	68.2
Vehicle Results					
Average Speed, mi/h		68.2	Percent Followers, %		34.7
Segment Travel Time, minutes		0.27	Follower Density (FD), followers/mi/ln		1.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		256	Bicycle Effective Width, ft		24
Bicycle LOS Score		6.34	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 20					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		595
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		256	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		12.21
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29239	PF Power Coefficient (p)		0.75923
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	595	-	-	67.9

Vehicle Results

Average Speed, mi/h	67.9	Percent Followers, %	36.8
Segment Travel Time, minutes	0.10	Follower Density (FD), followers/mi/ln	1.4
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	256	Bicycle Effective Width, ft	24
Bicycle LOS Score	6.34	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 21

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	958
Measured FFS	Measured	Free-Flow Speed, mi/h	55.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	245	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	10.81
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.14

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.43859	PF Power Coefficient (p)	0.72596
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.9
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	958	-	-	53.0

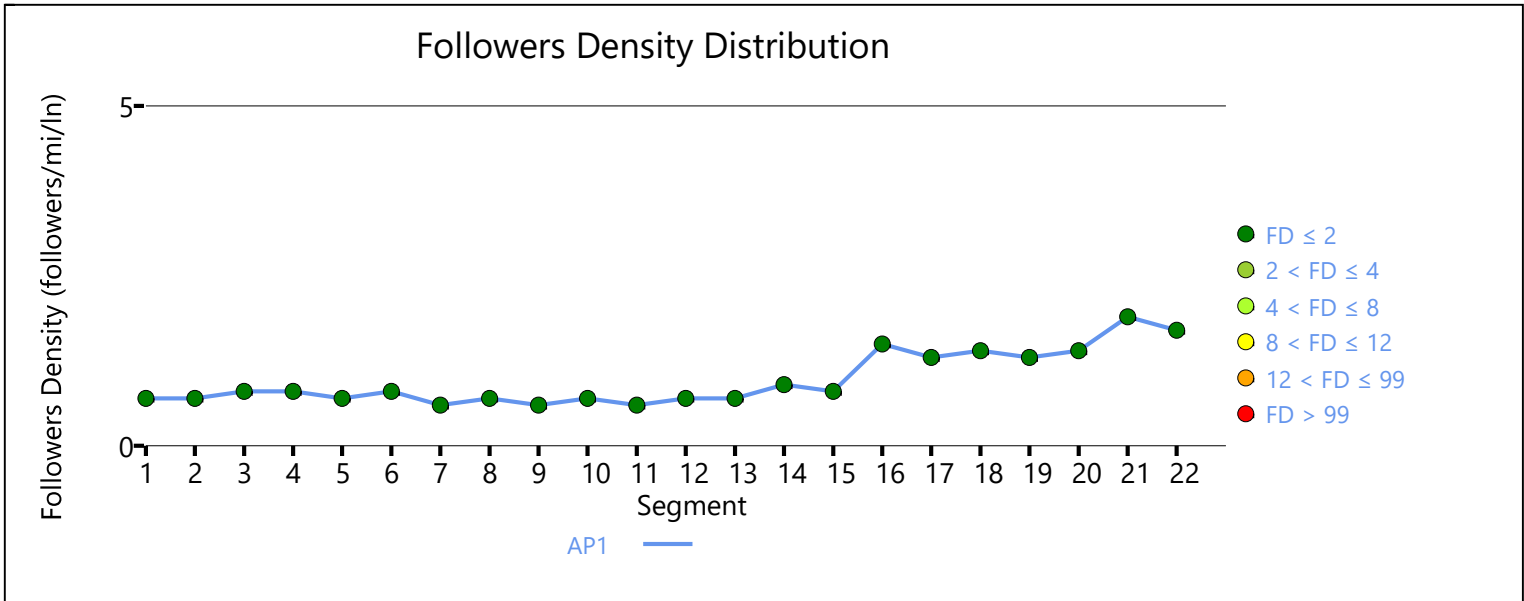
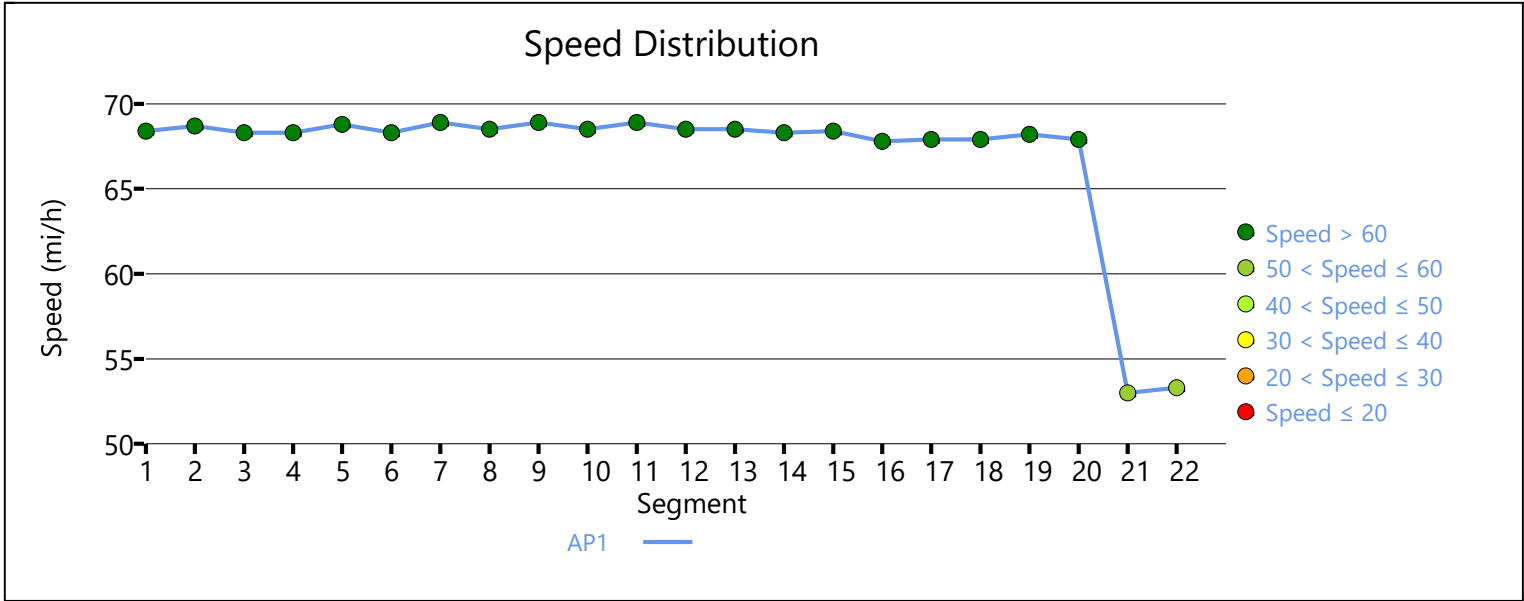
Vehicle Results

Average Speed, mi/h	53.0	Percent Followers, %	40.5
Segment Travel Time, minutes	0.21	Follower Density (FD), followers/mi/ln	1.9
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	245	Bicycle Effective Width, ft	24
Bicycle LOS Score	5.27	Bicycle Effective Speed Factor	4.62
Bicycle LOS	E		

Segment 22					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft	1659	
Measured FFS		Measured	Free-Flow Speed, mi/h	55.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		245	Opposing Demand Flow Rate, veh/h	405	
Peak Hour Factor		0.88	Total Trucks, %	10.81	
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)	0.14	
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h	55.0	
Speed Slope Coefficient (m)		4.38697	Speed Power Coefficient (p)	0.49609	
PF Slope Coefficient (m)		-1.34857	PF Power Coefficient (p)	0.76529	
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln	1.7	
%Improvement to Percent Followers		0.0	%Improvement to Speed	0.0	
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1659	-	-	53.3
Vehicle Results					
Average Speed, mi/h		53.3	Percent Followers, %	36.9	
Segment Travel Time, minutes		0.35	Follower Density (FD), followers/mi/ln	1.7	
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating	4	
Flow Rate Outside Lane, veh/h		245	Bicycle Effective Width, ft	24	
Bicycle LOS Score		5.27	Bicycle Effective Speed Factor	4.62	
Bicycle LOS		E			
Facility Results					
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS	
1	279	0.10	0.9	A	



HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	5/11/2023
Agency	HRG	Analysis Year	2029 NB
Jurisdiction	SDDOT	Time Analyzed	PM Peak
Project Description	SD 38 WB East of Hartford	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1727
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	534	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	8.97
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.31

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.58112	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.27241	PF Power Coefficient (p)	0.76681
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.4
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1727	-	-	66.8

Vehicle Results

Average Speed, mi/h	66.8	Percent Followers, %	54.5
Segment Travel Time, minutes	0.29	Follower Density (FD), followers/mi/ln	4.4
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	534	Bicycle Effective Width, ft	24
Bicycle LOS Score	5.29	Bicycle Effective Speed Factor	5.07
Bicycle LOS	E		

Segment 2

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1676
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity							
Directional Demand Flow Rate, veh/h		534		Opposing Demand Flow Rate, veh/h		253	
Peak Hour Factor		0.88		Total Trucks, %		8.97	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.31	
Intermediate Results							
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0	
Speed Slope Coefficient (m)		4.34379		Speed Power Coefficient (p)		0.52551	
PF Slope Coefficient (m)		-1.23127		PF Power Coefficient (p)		0.81132	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		4.2	
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0	
Subsegment Data							
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h		
1	Tangent	1676	-	-	67.2		
Vehicle Results							
Average Speed, mi/h		67.2		Percent Followers, %		52.3	
Segment Travel Time, minutes		0.28		Follower Density (FD), followers/mi/ln		4.2	
Vehicle LOS		C					
Bicycle Results							
Percent Occupied Parking		0		Pavement Condition Rating		4	
Flow Rate Outside Lane, veh/h		534		Bicycle Effective Width, ft		24	
Bicycle LOS Score		5.29		Bicycle Effective Speed Factor		5.07	
Bicycle LOS		E					
Segment 3							
Vehicle Inputs							
Segment Type		Passing Constrained		Length, ft		1864	
Measured FFS		Measured		Free-Flow Speed, mi/h		70.0	
Demand and Capacity							
Directional Demand Flow Rate, veh/h		335		Opposing Demand Flow Rate, veh/h		-	
Peak Hour Factor		0.88		Total Trucks, %		17.04	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.20	
Intermediate Results							
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0	
Speed Slope Coefficient (m)		4.58341		Speed Power Coefficient (p)		0.41674	
PF Slope Coefficient (m)		-1.26572		PF Power Coefficient (p)		0.77025	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		2.1	
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0	
Subsegment Data							

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1864	-	-	67.5

Vehicle Results

Average Speed, mi/h	67.5	Percent Followers, %	42.0
Segment Travel Time, minutes	0.31	Follower Density (FD), followers/mi/ln	2.1
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	335	Bicycle Effective Width, ft	24
Bicycle LOS Score	9.04	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 4

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	718
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	335	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	17.04
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.20

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29182	PF Power Coefficient (p)	0.75993
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.1
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	718	-	-	67.5

Vehicle Results

Average Speed, mi/h	67.5	Percent Followers, %	43.0
Segment Travel Time, minutes	0.12	Follower Density (FD), followers/mi/ln	2.1
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	335	Bicycle Effective Width, ft	24
Bicycle LOS Score	9.04	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Zone		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				1738	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		335		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.88		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.20	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
Speed Slope Coefficient (m)		4.34559		Speed Power Coefficient (p)	
PF Slope Coefficient (m)		-1.22813		PF Power Coefficient (p)	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln	
%Improvement to Percent Followers		0.0		%Improvement to Speed	
				0.0	
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1738	-	-	68.0
Vehicle Results					
Average Speed, mi/h		68.0		Percent Followers, %	
Segment Travel Time, minutes		0.29		Follower Density (FD), followers/mi/ln	
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0		Pavement Condition Rating	
Flow Rate Outside Lane, veh/h		335		Bicycle Effective Width, ft	
Bicycle LOS Score		9.04		Bicycle Effective Speed Factor	
Bicycle LOS		F			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				579	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		335		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.88		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.20	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
				70.0	

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29182	PF Power Coefficient (p)	0.75993
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.1
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	579	-	-	67.5

Vehicle Results

Average Speed, mi/h	67.5	Percent Followers, %	43.0
Segment Travel Time, minutes	0.10	Follower Density (FD), followers/mi/ln	2.1
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	335	Bicycle Effective Width, ft	24
Bicycle LOS Score	9.04	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 7

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	2262
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	288	Opposing Demand Flow Rate, veh/h	213
Peak Hour Factor	0.88	Total Trucks, %	18.44
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.17

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.33926	Speed Power Coefficient (p)	0.53581
PF Slope Coefficient (m)	-1.20084	PF Power Coefficient (p)	0.82484
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.5
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2262	-	-	68.2

Vehicle Results

Average Speed, mi/h	68.2	Percent Followers, %	34.9
Segment Travel Time, minutes	0.38	Follower Density (FD), followers/mi/ln	1.5
Vehicle LOS	A		

Bicycle Results											
Percent Occupied Parking		0		Pavement Condition Rating		4					
Flow Rate Outside Lane, veh/h		288		Bicycle Effective Width, ft		24					
Bicycle LOS Score		9.80		Bicycle Effective Speed Factor		5.07					
Bicycle LOS		F									
Segment 8											
Vehicle Inputs											
Segment Type		Passing Constrained		Length, ft		980					
Measured FFS		Measured		Free-Flow Speed, mi/h		70.0					
Demand and Capacity											
Directional Demand Flow Rate, veh/h		288		Opposing Demand Flow Rate, veh/h		-					
Peak Hour Factor		0.88		Total Trucks, %		18.44					
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.17					
Intermediate Results											
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0					
Speed Slope Coefficient (m)		4.57372		Speed Power Coefficient (p)		0.41674					
PF Slope Coefficient (m)		-1.29166		PF Power Coefficient (p)		0.76014					
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		1.7					
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0					
Subsegment Data											
#	Segment Type		Length, ft		Radius, ft		Superelevation, %		Average Speed, mi/h		
1	Tangent		980		-		-		67.7		
Vehicle Results											
Average Speed, mi/h			67.7			Percent Followers, %			39.4		
Segment Travel Time, minutes			0.16			Follower Density (FD), followers/mi/ln			1.7		
Vehicle LOS			A								
Bicycle Results											
Percent Occupied Parking			0			Pavement Condition Rating			4		
Flow Rate Outside Lane, veh/h			288			Bicycle Effective Width, ft			24		
Bicycle LOS Score			9.80			Bicycle Effective Speed Factor			5.07		
Bicycle LOS			F								
Segment 9											
Vehicle Inputs											
Segment Type			Passing Zone			Length, ft			3667		
Measured FFS			Measured			Free-Flow Speed, mi/h			70.0		
Demand and Capacity											

Directional Demand Flow Rate, veh/h		288	Opposing Demand Flow Rate, veh/h		213
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.17
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.35766	Speed Power Coefficient (p)		0.53581
PF Slope Coefficient (m)		-1.16975	PF Power Coefficient (p)		0.83655
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3667	-	-	68.2
Vehicle Results					
Average Speed, mi/h		68.2	Percent Followers, %		33.8
Segment Travel Time, minutes		0.61	Follower Density (FD), followers/mi/ln		1.4
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		288	Bicycle Effective Width, ft		24
Bicycle LOS Score		9.80	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1846
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		288	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.17
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.58311	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.26629	PF Power Coefficient (p)		0.77017
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	1846	-	-	67.7
Vehicle Results					
Average Speed, mi/h		67.7	Percent Followers, %		38.4
Segment Travel Time, minutes		0.31	Follower Density (FD), followers/mi/ln		1.6
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		288	Bicycle Effective Width, ft		24
Bicycle LOS Score		9.80	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		2174
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		288	Opposing Demand Flow Rate, veh/h		213
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.17
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.33794	Speed Power Coefficient (p)		0.53581
PF Slope Coefficient (m)		-1.20363	PF Power Coefficient (p)		0.82367
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2174	-	-	68.2
Vehicle Results					
Average Speed, mi/h		68.2	Percent Followers, %		35.0
Segment Travel Time, minutes		0.36	Follower Density (FD), followers/mi/ln		1.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		288	Bicycle Effective Width, ft		24
Bicycle LOS Score		9.80	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 12					

Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1277
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		288	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.17
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29166	PF Power Coefficient (p)		0.76014
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1277	-	-	67.7
Vehicle Results					
Average Speed, mi/h		67.7	Percent Followers, %		39.4
Segment Travel Time, minutes		0.21	Follower Density (FD), followers/mi/ln		1.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		288	Bicycle Effective Width, ft		24
Bicycle LOS Score		9.80	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		779
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		288	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.17
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29166	PF Power Coefficient (p)		0.76014

In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.7
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	779	-	-	67.7

Vehicle Results

Average Speed, mi/h	67.7	Percent Followers, %	39.4
Segment Travel Time, minutes	0.13	Follower Density (FD), followers/mi/ln	1.7
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	288	Bicycle Effective Width, ft	24
Bicycle LOS Score	9.80	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 14

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	422
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	327	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	13.95
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.19

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29219	PF Power Coefficient (p)	0.75948
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.1
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	422	-	-	67.5

Vehicle Results

Average Speed, mi/h	67.5	Percent Followers, %	42.5
Segment Travel Time, minutes	0.07	Follower Density (FD), followers/mi/ln	2.1
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
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Flow Rate Outside Lane, veh/h	327	Bicycle Effective Width, ft	24
Bicycle LOS Score	7.33	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 15

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1478
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	297	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	19.53
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.17

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57671	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.28298	PF Power Coefficient (p)	0.76370
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.7
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1478	-	-	67.7

Vehicle Results

Average Speed, mi/h	67.7	Percent Followers, %	39.8
Segment Travel Time, minutes	0.25	Follower Density (FD), followers/mi/ln	1.7
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	297	Bicycle Effective Width, ft	24
Bicycle LOS Score	10.50	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 16

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	384
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	585	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	12.76
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.34

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29233	PF Power Coefficient (p)	0.75931
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	5.1
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	384	-	-	66.6

Vehicle Results			
Average Speed, mi/h	66.6	Percent Followers, %	57.7
Segment Travel Time, minutes	0.07	Follower Density (FD), followers/mi/ln	5.1
Vehicle LOS	C		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	585	Bicycle Effective Width, ft	24
Bicycle LOS Score	7.03	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 17

Vehicle Inputs			
Segment Type	Passing Constrained	Length, ft	3732
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	588	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	12.21
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.35

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.60878	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.21846	PF Power Coefficient (p)	0.78615
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.9
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3732	-	-	66.6

Vehicle Results			
Average Speed, mi/h	66.6	Percent Followers, %	55.2

Segment Travel Time, minutes		0.64	Follower Density (FD), followers/mi/ln		4.9
Vehicle LOS		C			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		588	Bicycle Effective Width, ft		24
Bicycle LOS Score		6.77	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 18					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1360
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		588	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		12.21
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.35
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57450	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29014	PF Power Coefficient (p)		0.76012
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		5.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1360	-	-	66.6
Vehicle Results					
Average Speed, mi/h		66.6	Percent Followers, %		57.7
Segment Travel Time, minutes		0.23	Follower Density (FD), followers/mi/ln		5.1
Vehicle LOS		C			

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	588	Bicycle Effective Width, ft	24
Bicycle LOS Score	6.77	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		
Segment 19			
Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	1595
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity							
Directional Demand Flow Rate, veh/h		588		Opposing Demand Flow Rate, veh/h		265	
Peak Hour Factor		0.88		Total Trucks, %		12.21	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.35	
Intermediate Results							
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0	
Speed Slope Coefficient (m)		4.34603		Speed Power Coefficient (p)		0.52287	
PF Slope Coefficient (m)		-1.23654		PF Power Coefficient (p)		0.80951	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		4.8	
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0	
Subsegment Data							
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h		
1	Tangent	1595	-	-	67.0		
Vehicle Results							
Average Speed, mi/h		67.0		Percent Followers, %		55.2	
Segment Travel Time, minutes		0.27		Follower Density (FD), followers/mi/ln		4.8	
Vehicle LOS		C					
Bicycle Results							
Percent Occupied Parking		0		Pavement Condition Rating		4	
Flow Rate Outside Lane, veh/h		588		Bicycle Effective Width, ft		24	
Bicycle LOS Score		6.77		Bicycle Effective Speed Factor		5.07	
Bicycle LOS		F					
Segment 20							
Vehicle Inputs							
Segment Type		Passing Constrained		Length, ft		595	
Measured FFS		Measured		Free-Flow Speed, mi/h		70.0	
Demand and Capacity							
Directional Demand Flow Rate, veh/h		588		Opposing Demand Flow Rate, veh/h		-	
Peak Hour Factor		0.88		Total Trucks, %		12.21	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.35	
Intermediate Results							
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0	
Speed Slope Coefficient (m)		4.57372		Speed Power Coefficient (p)		0.41674	
PF Slope Coefficient (m)		-1.29239		PF Power Coefficient (p)		0.75923	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		5.1	
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0	
Subsegment Data							

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	595	-	-	66.6

Vehicle Results

Average Speed, mi/h	66.6	Percent Followers, %	57.8
Segment Travel Time, minutes	0.10	Follower Density (FD), followers/mi/ln	5.1
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	588	Bicycle Effective Width, ft	24
Bicycle LOS Score	6.77	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 21

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	958
Measured FFS	Measured	Free-Flow Speed, mi/h	55.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	467	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	10.81
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.27

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.43859	PF Power Coefficient (p)	0.72596
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	5.1
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	958	-	-	52.0

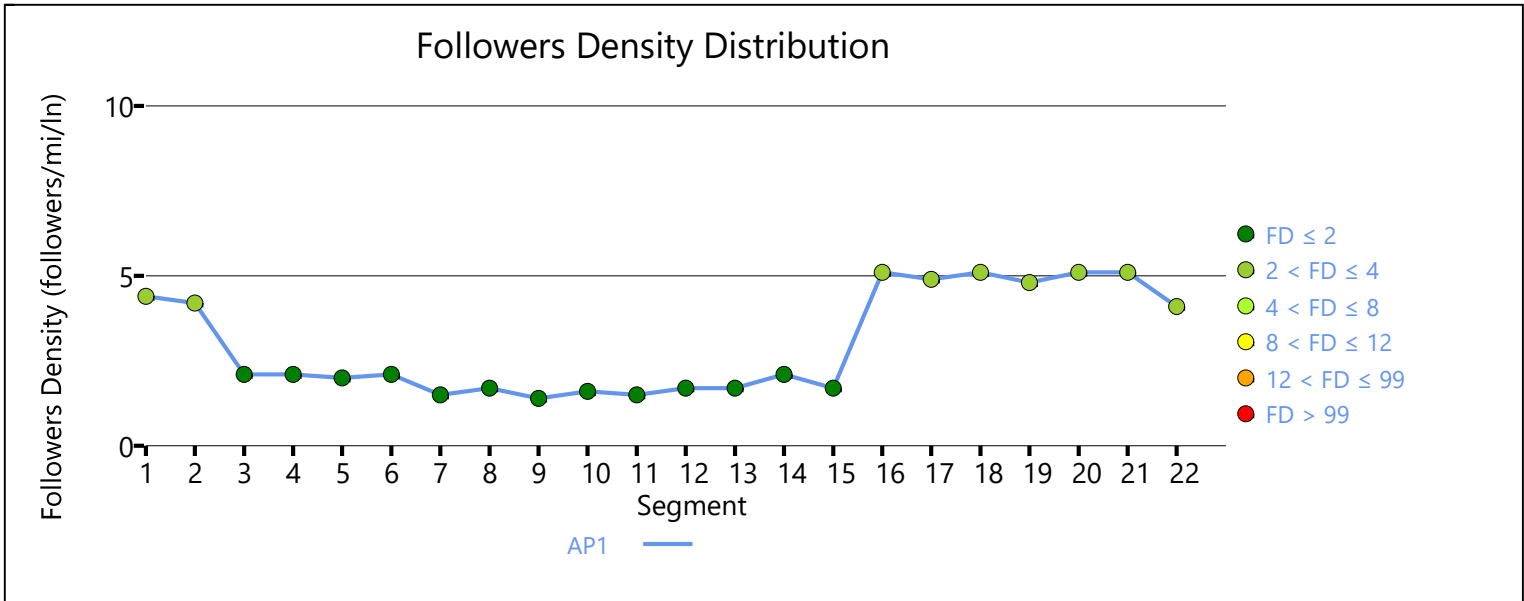
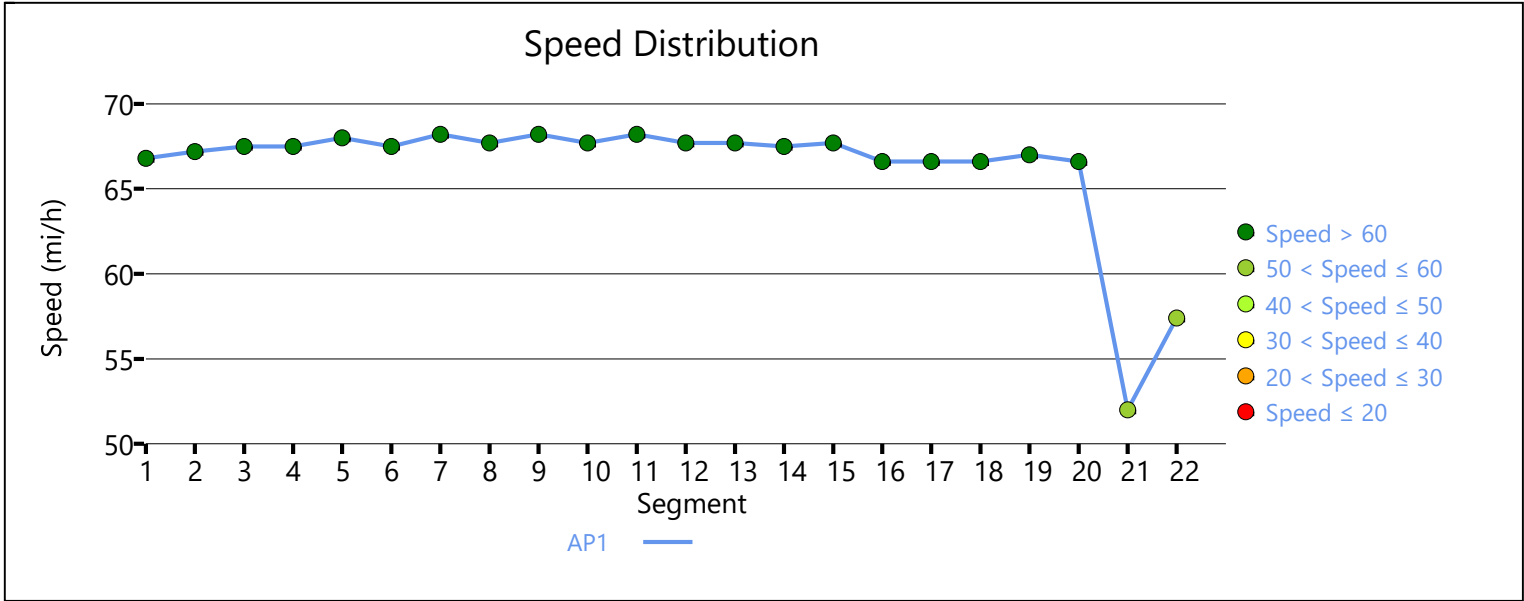
Vehicle Results

Average Speed, mi/h	52.0	Percent Followers, %	56.3
Segment Travel Time, minutes	0.21	Follower Density (FD), followers/mi/ln	5.1
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	467	Bicycle Effective Width, ft	24
Bicycle LOS Score	5.60	Bicycle Effective Speed Factor	4.62
Bicycle LOS	F		

Segment 22					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1659
Measured FFS		Measured	Free-Flow Speed, mi/h		60.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		467	Opposing Demand Flow Rate, veh/h		255
Peak Hour Factor		0.88	Total Trucks, %		10.81
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.27
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		60.0
Speed Slope Coefficient (m)		4.34386	Speed Power Coefficient (p)		0.52524
PF Slope Coefficient (m)		-1.29711	PF Power Coefficient (p)		0.78647
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		4.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1659	-	-	57.4
Vehicle Results					
Average Speed, mi/h		57.4	Percent Followers, %		51.0
Segment Travel Time, minutes		0.33	Follower Density (FD), followers/mi/ln		4.1
Vehicle LOS		C			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		467	Bicycle Effective Width, ft		24
Bicycle LOS Score		5.60	Bicycle Effective Speed Factor		4.62
Bicycle LOS		F			
Facility Results					
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln		LOS
1	562	0.34	2.9		B



HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	5/11/2023
Agency	HRG	Analysis Year	2029 NB
Jurisdiction	SDDOT	Time Analyzed	AM Peak
Project Description	West of Hartford SD 38 EB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1069
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	161	Opposing Demand Flow Rate, veh/h	111
Peak Hour Factor	0.88	Total Trucks, %	5.79
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.09

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.28164	Speed Power Coefficient (p)	0.56932
PF Slope Coefficient (m)	-1.21358	PF Power Coefficient (p)	0.81482
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.6
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1069	-	-	69.1

Vehicle Results

Average Speed, mi/h	69.1	Percent Followers, %	24.0
Segment Travel Time, minutes	0.18	Follower Density (FD), followers/mi/ln	0.6
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	161	Bicycle Effective Width, ft	29
Bicycle LOS Score	2.17	Bicycle Effective Speed Factor	5.07
Bicycle LOS	B		

Segment 2

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	664
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		161	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		5.79
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29315	PF Power Coefficient (p)		0.75829
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	664	-	-	68.6
Vehicle Results					
Average Speed, mi/h		68.6	Percent Followers, %		27.7
Segment Travel Time, minutes		0.11	Follower Density (FD), followers/mi/ln		0.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		161	Bicycle Effective Width, ft		29
Bicycle LOS Score		2.17	Bicycle Effective Speed Factor		5.07
Bicycle LOS		B			
Segment 3					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1871
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		161	Opposing Demand Flow Rate, veh/h		111
Peak Hour Factor		0.88	Total Trucks, %		5.79
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.29144	Speed Power Coefficient (p)		0.56932
PF Slope Coefficient (m)		-1.18894	PF Power Coefficient (p)		0.82627
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1871	-	-	69.1

Vehicle Results

Average Speed, mi/h	69.1	Percent Followers, %	23.2
Segment Travel Time, minutes	0.31	Follower Density (FD), followers/mi/ln	0.5
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	161	Bicycle Effective Width, ft	29
Bicycle LOS Score	2.17	Bicycle Effective Speed Factor	5.07
Bicycle LOS	B		

Segment 4

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	925
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	161	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	5.79
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.09

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29315	PF Power Coefficient (p)	0.75829
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.7
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	925	-	-	68.6

Vehicle Results

Average Speed, mi/h	68.6	Percent Followers, %	27.7
Segment Travel Time, minutes	0.15	Follower Density (FD), followers/mi/ln	0.7
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	161	Bicycle Effective Width, ft	29
Bicycle LOS Score	2.17	Bicycle Effective Speed Factor	5.07
Bicycle LOS	B		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		4476
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		161	Opposing Demand Flow Rate, veh/h		111
Peak Hour Factor		0.88	Total Trucks, %		5.79
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.32493	Speed Power Coefficient (p)		0.56932
PF Slope Coefficient (m)		-1.13549	PF Power Coefficient (p)		0.84699
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	4476	-	-	69.1
Vehicle Results					
Average Speed, mi/h		69.1	Percent Followers, %		21.5
Segment Travel Time, minutes		0.74	Follower Density (FD), followers/mi/ln		0.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		161	Bicycle Effective Width, ft		29
Bicycle LOS Score		2.17	Bicycle Effective Speed Factor		5.07
Bicycle LOS		B			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		896
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		161	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		5.79
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29315	PF Power Coefficient (p)	0.75829
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.7
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	896	-	-	68.6

Vehicle Results			
Average Speed, mi/h	68.6	Percent Followers, %	27.7
Segment Travel Time, minutes	0.15	Follower Density (FD), followers/mi/ln	0.7
Vehicle LOS	A		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	161	Bicycle Effective Width, ft	29
Bicycle LOS Score	2.17	Bicycle Effective Speed Factor	5.07
Bicycle LOS	B		

Segment 7			
Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	743
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	161	Opposing Demand Flow Rate, veh/h	111
Peak Hour Factor	0.88	Total Trucks, %	5.79
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.09

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.28164	Speed Power Coefficient (p)	0.56932
PF Slope Coefficient (m)	-1.21358	PF Power Coefficient (p)	0.81482
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.6
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	743	-	-	69.1

Vehicle Results			
Average Speed, mi/h	69.1	Percent Followers, %	24.0
Segment Travel Time, minutes	0.12	Follower Density (FD), followers/mi/ln	0.6
Vehicle LOS	A		

Bicycle Results											
Percent Occupied Parking		0		Pavement Condition Rating		4					
Flow Rate Outside Lane, veh/h		161		Bicycle Effective Width, ft		29					
Bicycle LOS Score		2.17		Bicycle Effective Speed Factor		5.07					
Bicycle LOS		B									
Segment 8											
Vehicle Inputs											
Segment Type		Passing Zone		Length, ft		2717					
Measured FFS		Measured		Free-Flow Speed, mi/h		70.0					
Demand and Capacity											
Directional Demand Flow Rate, veh/h		163		Opposing Demand Flow Rate, veh/h		110					
Peak Hour Factor		0.88		Total Trucks, %		3.28					
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.10					
Intermediate Results											
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0					
Speed Slope Coefficient (m)		4.30345		Speed Power Coefficient (p)		0.56980					
PF Slope Coefficient (m)		-1.16341		PF Power Coefficient (p)		0.83725					
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		0.5					
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0					
Subsegment Data											
#	Segment Type		Length, ft		Radius, ft		Superelevation, %		Average Speed, mi/h		
1	Tangent		2717		-		-		69.1		
Vehicle Results											
Average Speed, mi/h			69.1			Percent Followers, %			22.4		
Segment Travel Time, minutes			0.45			Follower Density (FD), followers/mi/ln			0.5		
Vehicle LOS			A								
Bicycle Results											
Percent Occupied Parking			0			Pavement Condition Rating			4		
Flow Rate Outside Lane, veh/h			162			Bicycle Effective Width, ft			29		
Bicycle LOS Score			1.40			Bicycle Effective Speed Factor			5.07		
Bicycle LOS			A								
Segment 9											
Vehicle Inputs											
Segment Type			Passing Constrained			Length, ft			1013		
Measured FFS			Measured			Free-Flow Speed, mi/h			70.0		
Demand and Capacity											

Directional Demand Flow Rate, veh/h		163	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		3.28
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29345	PF Power Coefficient (p)		0.75792
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1013	-	-	68.6
Vehicle Results					
Average Speed, mi/h		68.6	Percent Followers, %		27.8
Segment Travel Time, minutes		0.17	Follower Density (FD), followers/mi/ln		0.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		162	Bicycle Effective Width, ft		29
Bicycle LOS Score		1.40	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		4569
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		163	Opposing Demand Flow Rate, veh/h		110
Peak Hour Factor		0.88	Total Trucks, %		3.28
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.32535	Speed Power Coefficient (p)		0.56980
PF Slope Coefficient (m)		-1.13449	PF Power Coefficient (p)		0.84688
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	4569	-	-	69.1
Vehicle Results					
Average Speed, mi/h		69.1	Percent Followers, %		21.6
Segment Travel Time, minutes		0.75	Follower Density (FD), followers/mi/ln		0.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		162	Bicycle Effective Width, ft		29
Bicycle LOS Score		1.40	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		5676
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		175	Opposing Demand Flow Rate, veh/h		110
Peak Hour Factor		0.88	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.33632	Speed Power Coefficient (p)		0.56980
PF Slope Coefficient (m)		-1.12701	PF Power Coefficient (p)		0.84661
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5676	-	-	69.0
Vehicle Results					
Average Speed, mi/h		69.0	Percent Followers, %		22.7
Segment Travel Time, minutes		0.93	Follower Density (FD), followers/mi/ln		0.6
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		175	Bicycle Effective Width, ft		28
Bicycle LOS Score		1.59	Bicycle Effective Speed Factor		5.07
Bicycle LOS		B			
Segment 12					

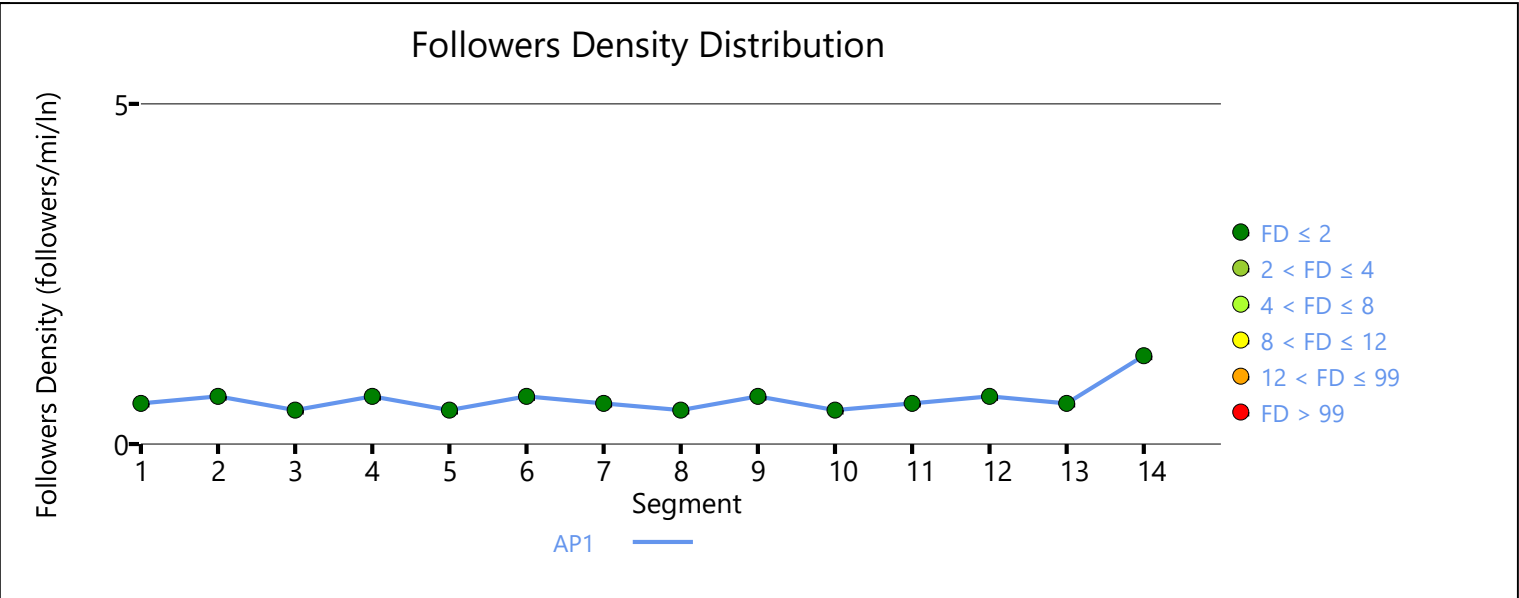
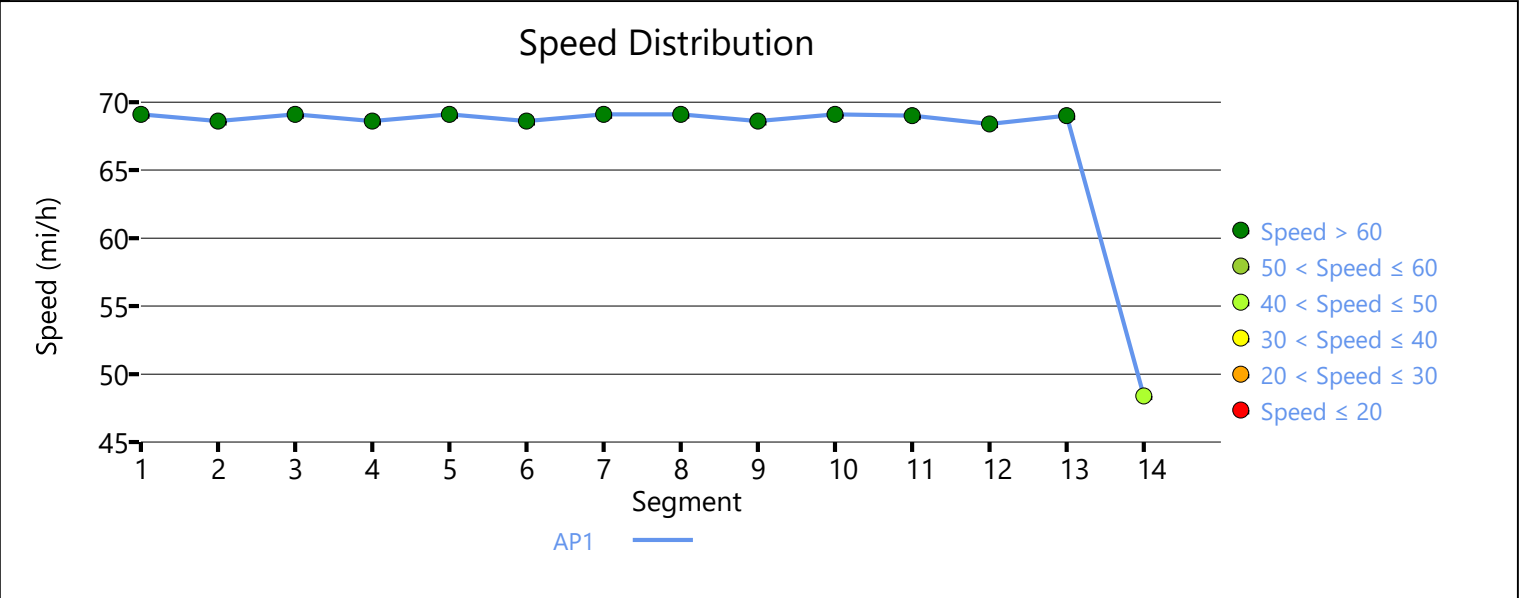
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		657
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		175	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29350	PF Power Coefficient (p)		0.75785
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	657	-	-	68.4
Vehicle Results					
Average Speed, mi/h		68.4	Percent Followers, %		29.2
Segment Travel Time, minutes		0.11	Follower Density (FD), followers/mi/ln		0.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		175	Bicycle Effective Width, ft		28
Bicycle LOS Score		1.59	Bicycle Effective Speed Factor		5.07
Bicycle LOS		B			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		6009
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		175	Opposing Demand Flow Rate, veh/h		110
Peak Hour Factor		0.88	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.33941	Speed Power Coefficient (p)		0.56980
PF Slope Coefficient (m)		-1.12571	PF Power Coefficient (p)		0.84594

In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	6009	-	-	69.0
Vehicle Results					
Average Speed, mi/h		69.0	Percent Followers, %		22.7
Segment Travel Time, minutes		0.99	Follower Density (FD), followers/mi/ln		0.6
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		175	Bicycle Effective Width, ft		28
Bicycle LOS Score		1.59	Bicycle Effective Speed Factor		5.07
Bicycle LOS		B			
Segment 14					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		891
Measured FFS		Measured	Free-Flow Speed, mi/h		50.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		175	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		50.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.47375	PF Power Coefficient (p)		0.71164
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	891	-	-	48.4
Vehicle Results					
Average Speed, mi/h		48.4	Percent Followers, %		34.7
Segment Travel Time, minutes		0.21	Follower Density (FD), followers/mi/ln		1.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4

Flow Rate Outside Lane, veh/h	175	Bicycle Effective Width, ft	28
Bicycle LOS Score	1.38	Bicycle Effective Speed Factor	4.42
Bicycle LOS	A		

Facility Results				
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	224	0.05	0.6	A



HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	5/11/2023
Agency	HRG	Analysis Year	2029 NB
Jurisdiction	SDDOT	Time Analyzed	PM Peak
Project Description	West of Hartford SD 38 EB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1069
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	100	Opposing Demand Flow Rate, veh/h	184
Peak Hour Factor	0.88	Total Trucks, %	5.79
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.06

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.31290	Speed Power Coefficient (p)	0.54385
PF Slope Coefficient (m)	-1.23457	PF Power Coefficient (p)	0.80823
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1069	-	-	70.0

Vehicle Results

Average Speed, mi/h	70.0	Percent Followers, %	17.5
Segment Travel Time, minutes	0.17	Follower Density (FD), followers/mi/ln	0.2
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	100	Bicycle Effective Width, ft	34
Bicycle LOS Score	0.35	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 2

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	664
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		100	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		5.79
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.06
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29315	PF Power Coefficient (p)		0.75829
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	664	-	-	70.0
Vehicle Results					
Average Speed, mi/h		70.0	Percent Followers, %		20.2
Segment Travel Time, minutes		0.11	Follower Density (FD), followers/mi/ln		0.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		100	Bicycle Effective Width, ft		34
Bicycle LOS Score		0.35	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 3					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1871
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		100	Opposing Demand Flow Rate, veh/h		184
Peak Hour Factor		0.88	Total Trucks, %		5.79
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.06
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.32270	Speed Power Coefficient (p)		0.54385
PF Slope Coefficient (m)		-1.20944	PF Power Coefficient (p)		0.81940
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1871	-	-	70.0

Vehicle Results

Average Speed, mi/h	70.0	Percent Followers, %	16.7
Segment Travel Time, minutes	0.30	Follower Density (FD), followers/mi/ln	0.2
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	100	Bicycle Effective Width, ft	34
Bicycle LOS Score	0.35	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 4

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	925
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	100	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	5.79
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.06

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29315	PF Power Coefficient (p)	0.75829
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	925	-	-	70.0

Vehicle Results

Average Speed, mi/h	70.0	Percent Followers, %	20.2
Segment Travel Time, minutes	0.15	Follower Density (FD), followers/mi/ln	0.3
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	100	Bicycle Effective Width, ft	34
Bicycle LOS Score	0.35	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Zone		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
4476		70.0			
Demand and Capacity					
Directional Demand Flow Rate, veh/h		100		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.88		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
184		0.06			
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
Speed Slope Coefficient (m)		4.35619		Speed Power Coefficient (p)	
PF Slope Coefficient (m)		-1.15496		PF Power Coefficient (p)	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln	
%Improvement to Percent Followers		0.0		%Improvement to Speed	
70.0		0.0			
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	4476	-	-	70.0
Vehicle Results					
Average Speed, mi/h		70.0		Percent Followers, %	
Segment Travel Time, minutes		0.73		Follower Density (FD), followers/mi/ln	
Vehicle LOS		A			
15.4		0.2			
Bicycle Results					
Percent Occupied Parking		0		Pavement Condition Rating	
Flow Rate Outside Lane, veh/h		100		Bicycle Effective Width, ft	
Bicycle LOS Score		0.35		Bicycle Effective Speed Factor	
Bicycle LOS		A			
4		34		5.07	
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
896		70.0			
Demand and Capacity					
Directional Demand Flow Rate, veh/h		100		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.88		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
-		0.06			
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
70.0					

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29315	PF Power Coefficient (p)	0.75829
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	896	-	-	70.0

Vehicle Results

Average Speed, mi/h	70.0	Percent Followers, %	20.2
Segment Travel Time, minutes	0.15	Follower Density (FD), followers/mi/ln	0.3
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	100	Bicycle Effective Width, ft	34
Bicycle LOS Score	0.35	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 7

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	743
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	100	Opposing Demand Flow Rate, veh/h	184
Peak Hour Factor	0.88	Total Trucks, %	5.79
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.06

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.31290	Speed Power Coefficient (p)	0.54385
PF Slope Coefficient (m)	-1.23457	PF Power Coefficient (p)	0.80823
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	743	-	-	70.0

Vehicle Results

Average Speed, mi/h	70.0	Percent Followers, %	17.5
Segment Travel Time, minutes	0.12	Follower Density (FD), followers/mi/ln	0.2
Vehicle LOS	A		

Bicycle Results											
Percent Occupied Parking		0		Pavement Condition Rating		4					
Flow Rate Outside Lane, veh/h		100		Bicycle Effective Width, ft		34					
Bicycle LOS Score		0.35		Bicycle Effective Speed Factor		5.07					
Bicycle LOS		A									
Segment 8											
Vehicle Inputs											
Segment Type		Passing Zone		Length, ft		2717					
Measured FFS		Measured		Free-Flow Speed, mi/h		70.0					
Demand and Capacity											
Directional Demand Flow Rate, veh/h		105		Opposing Demand Flow Rate, veh/h		0					
Peak Hour Factor		0.88		Total Trucks, %		3.28					
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.06					
Intermediate Results											
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0					
Speed Slope Coefficient (m)		4.19461		Speed Power Coefficient (p)		0.67576					
PF Slope Coefficient (m)		-1.07584		PF Power Coefficient (p)		0.86675					
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		0.2					
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0					
Subsegment Data											
#	Segment Type		Length, ft		Radius, ft		Superelevation, %		Average Speed, mi/h		
1	Tangent		2717		-		-		69.9		
Vehicle Results											
Average Speed, mi/h			69.9			Percent Followers, %			14.1		
Segment Travel Time, minutes			0.44			Follower Density (FD), followers/mi/ln			0.2		
Vehicle LOS			A								
Bicycle Results											
Percent Occupied Parking			0			Pavement Condition Rating			4		
Flow Rate Outside Lane, veh/h			105			Bicycle Effective Width, ft			34		
Bicycle LOS Score			0.00			Bicycle Effective Speed Factor			5.07		
Bicycle LOS			A								
Segment 9											
Vehicle Inputs											
Segment Type			Passing Constrained			Length, ft			1013		
Measured FFS			Measured			Free-Flow Speed, mi/h			70.0		
Demand and Capacity											

Directional Demand Flow Rate, veh/h		105	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		3.28
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.06
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29345	PF Power Coefficient (p)		0.75792
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1013	-	-	69.5
Vehicle Results					
Average Speed, mi/h		69.5	Percent Followers, %		20.8
Segment Travel Time, minutes		0.17	Follower Density (FD), followers/mi/ln		0.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		105	Bicycle Effective Width, ft		34
Bicycle LOS Score		0.00	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		4569
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		105	Opposing Demand Flow Rate, veh/h		180
Peak Hour Factor		0.88	Total Trucks, %		3.28
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.06
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.35542	Speed Power Coefficient (p)		0.54521
PF Slope Coefficient (m)		-1.15329	PF Power Coefficient (p)		0.83962
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	4569	-	-	69.8
Vehicle Results					
Average Speed, mi/h		69.8	Percent Followers, %		15.9
Segment Travel Time, minutes		0.74	Follower Density (FD), followers/mi/ln		0.2
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		105	Bicycle Effective Width, ft		34
Bicycle LOS Score		0.00	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		5676
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		118	Opposing Demand Flow Rate, veh/h		189
Peak Hour Factor		0.88	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.07
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.36986	Speed Power Coefficient (p)		0.54251
PF Slope Coefficient (m)		-1.14767	PF Power Coefficient (p)		0.83845
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5676	-	-	69.5
Vehicle Results					
Average Speed, mi/h		69.5	Percent Followers, %		17.4
Segment Travel Time, minutes		0.93	Follower Density (FD), followers/mi/ln		0.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		118	Bicycle Effective Width, ft		33
Bicycle LOS Score		0.00	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 12					

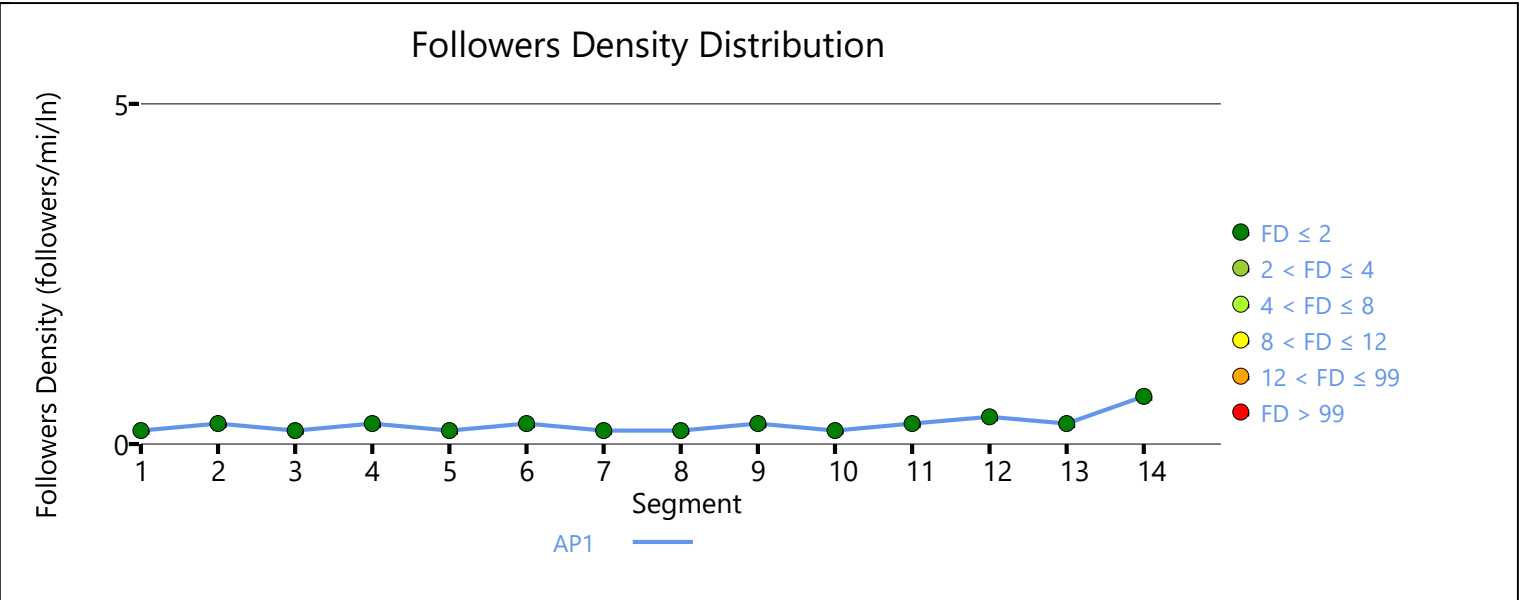
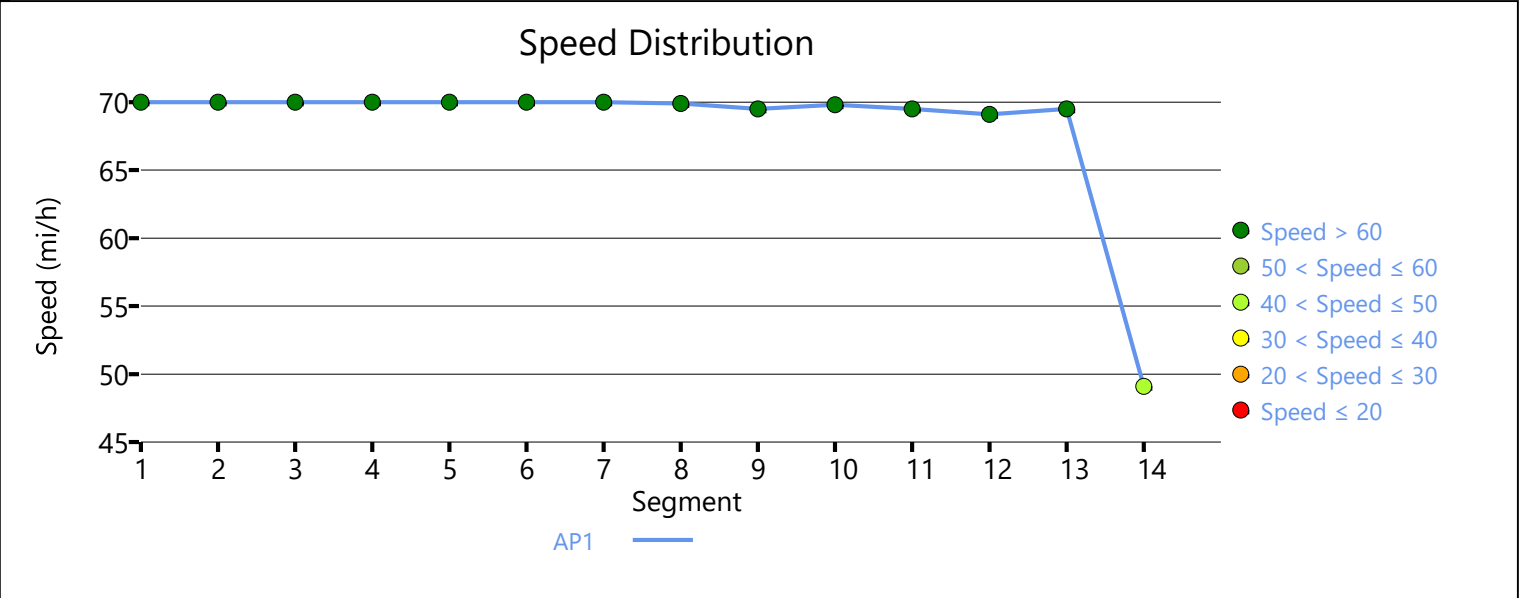
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		657
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		118	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.07
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29350	PF Power Coefficient (p)		0.75785
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	657	-	-	69.1
Vehicle Results					
Average Speed, mi/h		69.1	Percent Followers, %		22.6
Segment Travel Time, minutes		0.11	Follower Density (FD), followers/mi/ln		0.4
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		118	Bicycle Effective Width, ft		33
Bicycle LOS Score		0.00	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		6009
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		118	Opposing Demand Flow Rate, veh/h		189
Peak Hour Factor		0.88	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.07
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.37295	Speed Power Coefficient (p)		0.54251
PF Slope Coefficient (m)		-1.14633	PF Power Coefficient (p)		0.83776

In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	6009	-	-	69.5
Vehicle Results					
Average Speed, mi/h		69.5	Percent Followers, %		17.4
Segment Travel Time, minutes		0.98	Follower Density (FD), followers/mi/ln		0.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		118	Bicycle Effective Width, ft		33
Bicycle LOS Score		0.00	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 14					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		891
Measured FFS		Measured	Free-Flow Speed, mi/h		50.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		118	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.07
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		50.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.47375	PF Power Coefficient (p)		0.71164
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	891	-	-	49.1
Vehicle Results					
Average Speed, mi/h		49.1	Percent Followers, %		27.6
Segment Travel Time, minutes		0.21	Follower Density (FD), followers/mi/ln		0.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4

Flow Rate Outside Lane, veh/h	118	Bicycle Effective Width, ft	33
Bicycle LOS Score	0.00	Bicycle Effective Speed Factor	4.42
Bicycle LOS	A		

Facility Results				
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	146	0.01	0.3	A



HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	5/17/2023
Agency	HRG	Analysis Year	2029 NB
Jurisdiction	SDDOT	Time Analyzed	AM Peak
Project Description	WB 38 West of Hartford	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	10549
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	110	Opposing Demand Flow Rate, veh/h	175
Peak Hour Factor	0.88	Total Trucks, %	12.50
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.06

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.40338	Speed Power Coefficient (p)	0.54661
PF Slope Coefficient (m)	-1.15301	PF Power Coefficient (p)	0.81301
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	10549	-	-	69.6

Vehicle Results

Average Speed, mi/h	69.6	Percent Followers, %	17.5
Segment Travel Time, minutes	1.72	Follower Density (FD), followers/mi/ln	0.3
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	110	Bicycle Effective Width, ft	33
Bicycle LOS Score	3.49	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 2

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	2793
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		110	Opposing Demand Flow Rate, veh/h		175
Peak Hour Factor		0.88	Total Trucks, %		12.50
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.06
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.33277	Speed Power Coefficient (p)		0.54661
PF Slope Coefficient (m)		-1.17889	PF Power Coefficient (p)		0.83286
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2793	-	-	69.6
Vehicle Results					
Average Speed, mi/h		69.6	Percent Followers, %		17.1
Segment Travel Time, minutes		0.46	Follower Density (FD), followers/mi/ln		0.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		110	Bicycle Effective Width, ft		33
Bicycle LOS Score		3.49	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 3					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		3825
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		110	Opposing Demand Flow Rate, veh/h		163
Peak Hour Factor		0.88	Total Trucks, %		2.40
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.06
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.34052	Speed Power Coefficient (p)		0.55056
PF Slope Coefficient (m)		-1.15802	PF Power Coefficient (p)		0.83912
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3825	-	-	69.7

Vehicle Results

Average Speed, mi/h	69.7	Percent Followers, %	16.6
Segment Travel Time, minutes	0.62	Follower Density (FD), followers/mi/ln	0.3
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	110	Bicycle Effective Width, ft	33
Bicycle LOS Score	0.00	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 4

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	791
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	110	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	2.40
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.06

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29355	PF Power Coefficient (p)	0.75779
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	791	-	-	69.3

Vehicle Results

Average Speed, mi/h	69.3	Percent Followers, %	21.6
Segment Travel Time, minutes	0.13	Follower Density (FD), followers/mi/ln	0.3
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	110	Bicycle Effective Width, ft	33
Bicycle LOS Score	0.00	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		3414
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		110	Opposing Demand Flow Rate, veh/h		163
Peak Hour Factor		0.88	Total Trucks, %		2.40
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.06
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.33568	Speed Power Coefficient (p)		0.55056
PF Slope Coefficient (m)		-1.16442	PF Power Coefficient (p)		0.83709
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3414	-	-	69.7
Vehicle Results					
Average Speed, mi/h		69.7	Percent Followers, %		16.8
Segment Travel Time, minutes		0.56	Follower Density (FD), followers/mi/ln		0.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		110	Bicycle Effective Width, ft		33
Bicycle LOS Score		0.00	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		286
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		110	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.40
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.06
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29355	PF Power Coefficient (p)	0.75779
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	286	-	-	69.3

Vehicle Results

Average Speed, mi/h	69.3	Percent Followers, %	21.6
Segment Travel Time, minutes	0.05	Follower Density (FD), followers/mi/ln	0.3
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	110	Bicycle Effective Width, ft	33
Bicycle LOS Score	0.00	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 7

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	463
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	111	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	2.60
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.07

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29353	PF Power Coefficient (p)	0.75782
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	463	-	-	69.3

Vehicle Results

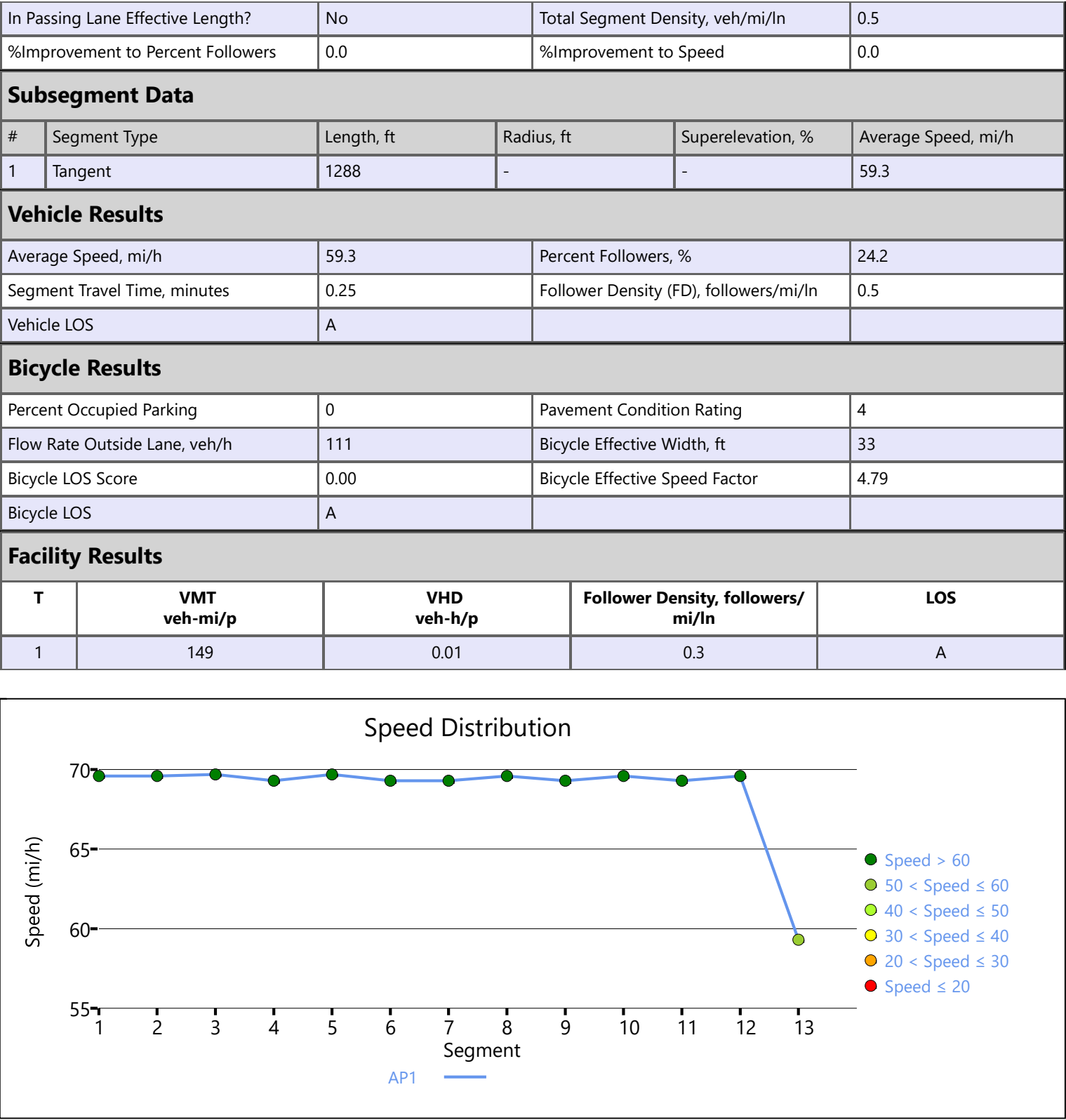
Average Speed, mi/h	69.3	Percent Followers, %	21.7
Segment Travel Time, minutes	0.08	Follower Density (FD), followers/mi/ln	0.3
Vehicle LOS	A		

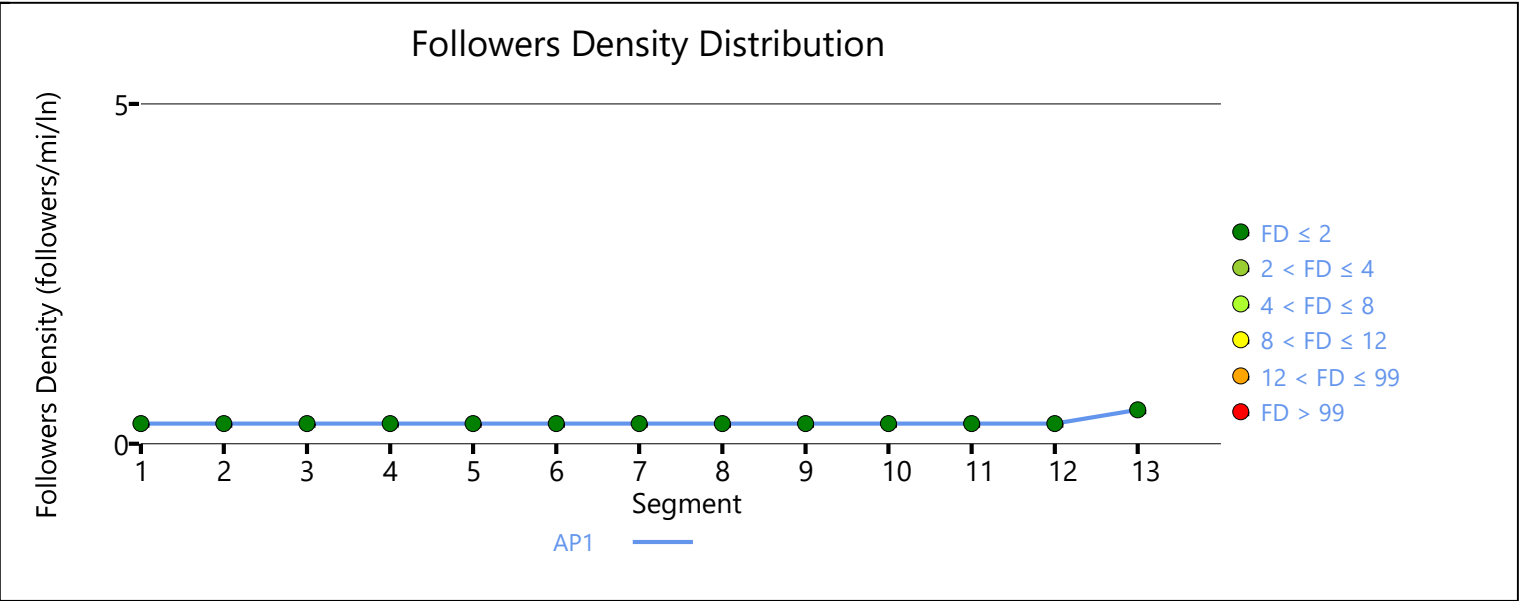
Bicycle Results					
Percent Occupied Parking	0	Pavement Condition Rating	4		
Flow Rate Outside Lane, veh/h	111	Bicycle Effective Width, ft	33		
Bicycle LOS Score	0.00	Bicycle Effective Speed Factor	5.07		
Bicycle LOS	A				
Segment 8					
Vehicle Inputs					
Segment Type	Passing Zone	Length, ft	4822		
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0		
Demand and Capacity					
Directional Demand Flow Rate, veh/h	111	Opposing Demand Flow Rate, veh/h	161		
Peak Hour Factor	0.88	Total Trucks, %	2.60		
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.07		
Intermediate Results					
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0		
Speed Slope Coefficient (m)	4.35081	Speed Power Coefficient (p)	0.55093		
PF Slope Coefficient (m)	-1.14681	PF Power Coefficient (p)	0.84146		
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.3		
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0		
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	4822	-	-	69.6
Vehicle Results					
Average Speed, mi/h	69.6	Percent Followers, %	16.5		
Segment Travel Time, minutes	0.79	Follower Density (FD), followers/mi/ln	0.3		
Vehicle LOS	A				
Bicycle Results					
Percent Occupied Parking	0	Pavement Condition Rating	4		
Flow Rate Outside Lane, veh/h	111	Bicycle Effective Width, ft	33		
Bicycle LOS Score	0.00	Bicycle Effective Speed Factor	5.07		
Bicycle LOS	A				
Segment 9					
Vehicle Inputs					
Segment Type	Passing Constrained	Length, ft	861		
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0		
Demand and Capacity					

Directional Demand Flow Rate, veh/h		111	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.60
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.07
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29353	PF Power Coefficient (p)		0.75782
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	861	-	-	69.3
Vehicle Results					
Average Speed, mi/h		69.3	Percent Followers, %		21.7
Segment Travel Time, minutes		0.14	Follower Density (FD), followers/mi/ln		0.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		111	Bicycle Effective Width, ft		33
Bicycle LOS Score		0.00	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1556
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		111	Opposing Demand Flow Rate, veh/h		161
Peak Hour Factor		0.88	Total Trucks, %		2.60
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.07
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.30834	Speed Power Coefficient (p)		0.55093
PF Slope Coefficient (m)		-1.21738	PF Power Coefficient (p)		0.81494
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	1556	-	-	69.6
Vehicle Results					
Average Speed, mi/h		69.6	Percent Followers, %		18.4
Segment Travel Time, minutes		0.25	Follower Density (FD), followers/mi/ln		0.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		111	Bicycle Effective Width, ft		33
Bicycle LOS Score		0.00	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		799
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		111	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.60
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.07
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29353	PF Power Coefficient (p)		0.75782
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	799	-	-	69.3
Vehicle Results					
Average Speed, mi/h		69.3	Percent Followers, %		21.7
Segment Travel Time, minutes		0.13	Follower Density (FD), followers/mi/ln		0.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		111	Bicycle Effective Width, ft		33
Bicycle LOS Score		0.00	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 12					

Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		857
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		111	Opposing Demand Flow Rate, veh/h		161
Peak Hour Factor		0.88	Total Trucks, %		2.60
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.07
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.30393	Speed Power Coefficient (p)		0.55093
PF Slope Coefficient (m)		-1.22917	PF Power Coefficient (p)		0.80961
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	857	-	-	69.6
Vehicle Results					
Average Speed, mi/h		69.6	Percent Followers, %		18.8
Segment Travel Time, minutes		0.14	Follower Density (FD), followers/mi/ln		0.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		111	Bicycle Effective Width, ft		33
Bicycle LOS Score		0.00	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1288
Measured FFS		Measured	Free-Flow Speed, mi/h		60.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		111	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.60
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.07
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		60.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.39677	PF Power Coefficient (p)		0.73640





HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	5/11/2023
Agency	HRG	Analysis Year	2029 NB
Jurisdiction	SDDOT	Time Analyzed	PM Peak
Project Description	WB 38 West of Hartford	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	10549
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	189	Opposing Demand Flow Rate, veh/h	118
Peak Hour Factor	0.88	Total Trucks, %	1.94
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.11

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.37894	Speed Power Coefficient (p)	0.56653
PF Slope Coefficient (m)	-1.13897	PF Power Coefficient (p)	0.81724
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.7
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	10549	-	-	68.9

Vehicle Results

Average Speed, mi/h	68.9	Percent Followers, %	25.3
Segment Travel Time, minutes	1.74	Follower Density (FD), followers/mi/ln	0.7
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	189	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.44	Bicycle Effective Speed Factor	5.07
Bicycle LOS	B		

Segment 2

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	2793
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		189	Opposing Demand Flow Rate, veh/h		118
Peak Hour Factor		0.88	Total Trucks, %		1.94
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.11
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.30833	Speed Power Coefficient (p)		0.56653
PF Slope Coefficient (m)		-1.16438	PF Power Coefficient (p)		0.83687
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2793	-	-	68.9
Vehicle Results					
Average Speed, mi/h		68.9	Percent Followers, %		25.0
Segment Travel Time, minutes		0.46	Follower Density (FD), followers/mi/ln		0.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		189	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.44	Bicycle Effective Speed Factor		5.07
Bicycle LOS		B			
Segment 3					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		3825
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		180	Opposing Demand Flow Rate, veh/h		105
Peak Hour Factor		0.88	Total Trucks, %		2.19
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.11
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.31437	Speed Power Coefficient (p)		0.57223
PF Slope Coefficient (m)		-1.14124	PF Power Coefficient (p)		0.84536
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3825	-	-	69.0

Vehicle Results

Average Speed, mi/h	69.0	Percent Followers, %	23.5
Segment Travel Time, minutes	0.63	Follower Density (FD), followers/mi/ln	0.6
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	180	Bicycle Effective Width, ft	28
Bicycle LOS Score	1.44	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 4

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	791
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	180	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	2.19
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.11

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29358	PF Power Coefficient (p)	0.75776
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.8
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	791	-	-	68.4

Vehicle Results

Average Speed, mi/h	68.4	Percent Followers, %	29.7
Segment Travel Time, minutes	0.13	Follower Density (FD), followers/mi/ln	0.8
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	180	Bicycle Effective Width, ft	28
Bicycle LOS Score	1.44	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Zone		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				3414	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		180		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.88		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.11	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
Speed Slope Coefficient (m)		4.30953		Speed Power Coefficient (p)	
PF Slope Coefficient (m)		-1.14753		PF Power Coefficient (p)	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln	
%Improvement to Percent Followers		0.0		%Improvement to Speed	
				0.0	
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3414	-	-	69.0
Vehicle Results					
Average Speed, mi/h		69.0		Percent Followers, %	
Segment Travel Time, minutes		0.56		Follower Density (FD), followers/mi/ln	
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0		Pavement Condition Rating	
Flow Rate Outside Lane, veh/h		180		Bicycle Effective Width, ft	
Bicycle LOS Score		1.44		Bicycle Effective Speed Factor	
Bicycle LOS		A			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				286	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		180		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.88		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.11	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
				70.0	

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29358	PF Power Coefficient (p)	0.75776
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.8
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	286	-	-	68.4

Vehicle Results			
Average Speed, mi/h	68.4	Percent Followers, %	29.7
Segment Travel Time, minutes	0.05	Follower Density (FD), followers/mi/ln	0.8
Vehicle LOS	A		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	180	Bicycle Effective Width, ft	28
Bicycle LOS Score	1.44	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 7

Vehicle Inputs			
Segment Type	Passing Constrained	Length, ft	463
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	184	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	3.08
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.11

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29347	PF Power Coefficient (p)	0.75789
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.8
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	463	-	-	68.4

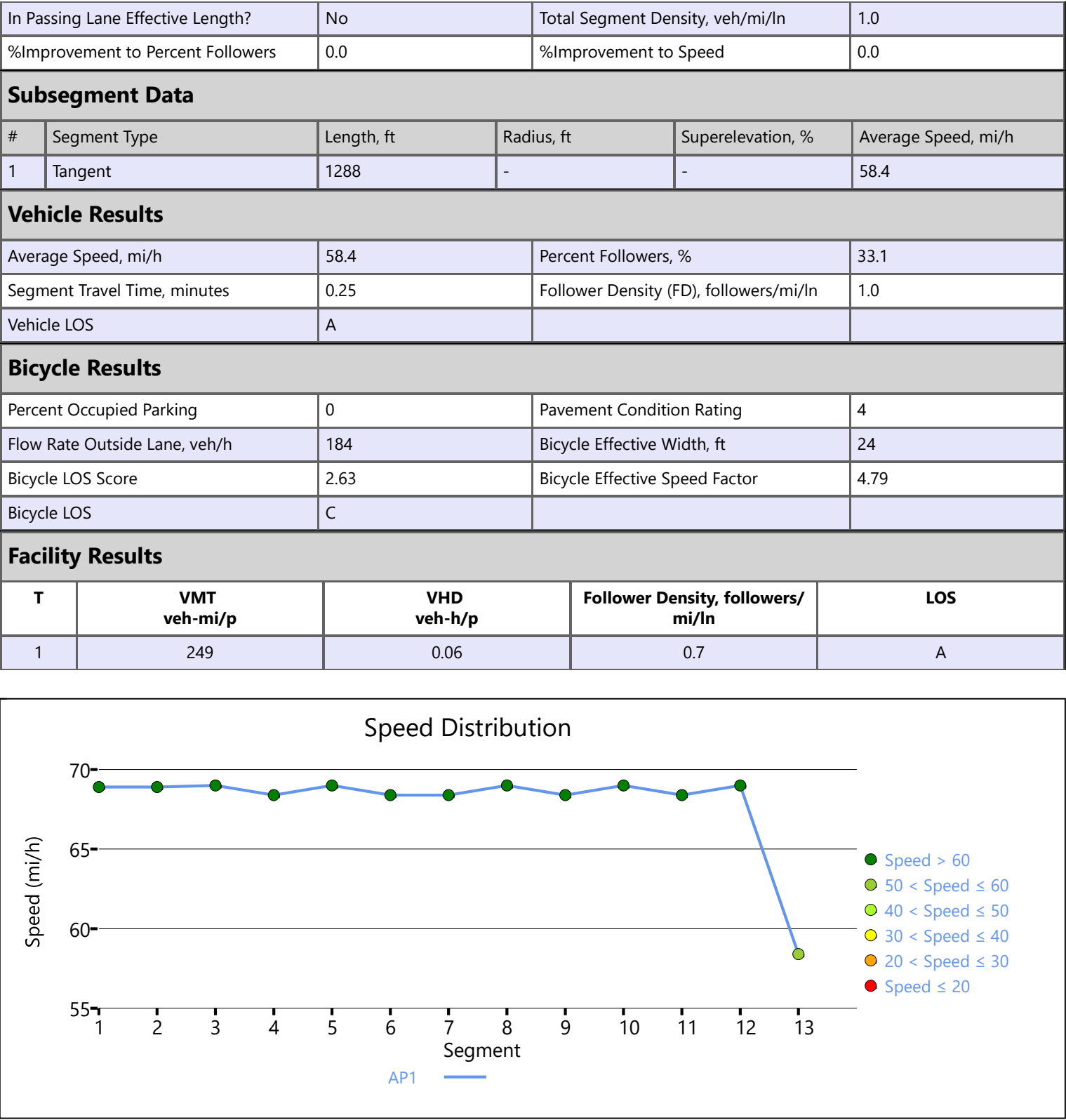
Vehicle Results			
Average Speed, mi/h	68.4	Percent Followers, %	30.1
Segment Travel Time, minutes	0.08	Follower Density (FD), followers/mi/ln	0.8
Vehicle LOS	A		

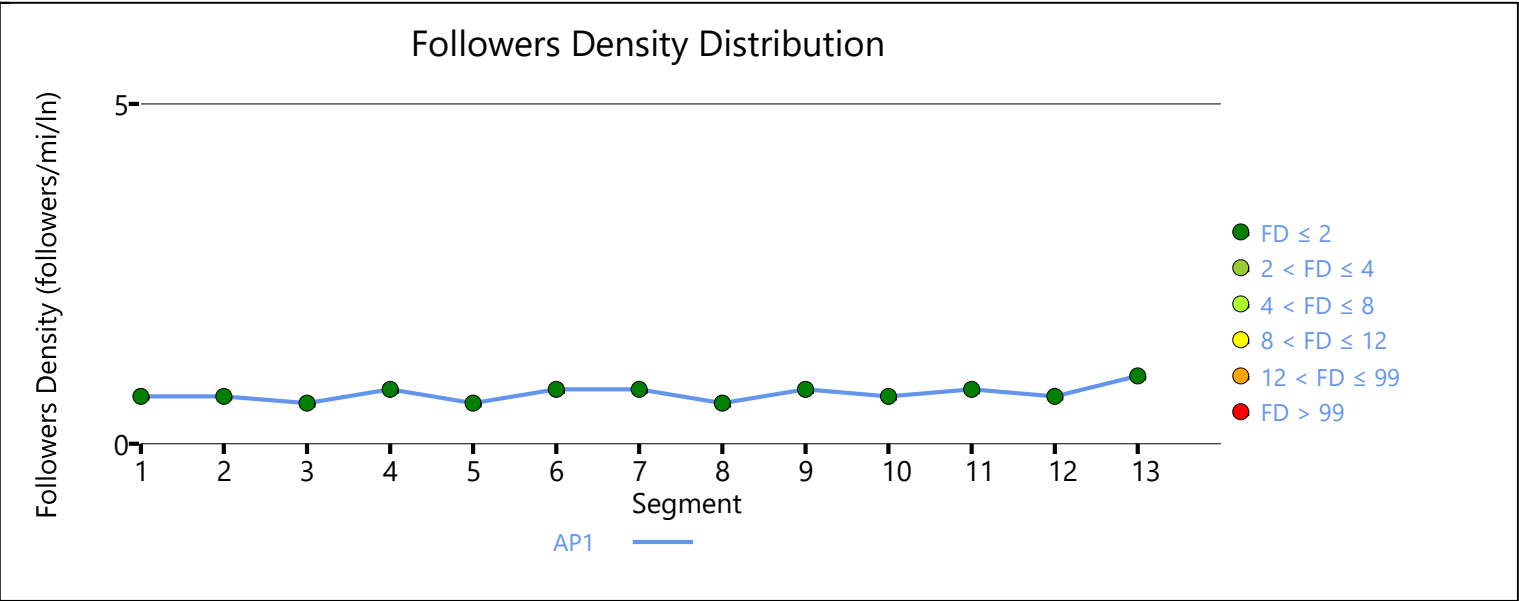
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		184	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.73	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 8					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		4822
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		184	Opposing Demand Flow Rate, veh/h		100
Peak Hour Factor		0.88	Total Trucks, %		3.08
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.11
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.32280	Speed Power Coefficient (p)		0.57423
PF Slope Coefficient (m)		-1.12885	PF Power Coefficient (p)		0.84841
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	4822	-	-	69.0
Vehicle Results					
Average Speed, mi/h		69.0	Percent Followers, %		23.6
Segment Travel Time, minutes		0.79	Follower Density (FD), followers/mi/ln		0.6
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		184	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.73	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 9					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		861
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					

Directional Demand Flow Rate, veh/h		184	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		3.08
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.11
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29347	PF Power Coefficient (p)		0.75789
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.8
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	861	-	-	68.4
Vehicle Results					
Average Speed, mi/h		68.4	Percent Followers, %		30.1
Segment Travel Time, minutes		0.14	Follower Density (FD), followers/mi/ln		0.8
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		184	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.73	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1556
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		184	Opposing Demand Flow Rate, veh/h		100
Peak Hour Factor		0.88	Total Trucks, %		3.08
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.11
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.28032	Speed Power Coefficient (p)		0.57423
PF Slope Coefficient (m)		-1.19816	PF Power Coefficient (p)		0.82111
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	1556	-	-	69.0
Vehicle Results					
Average Speed, mi/h		69.0	Percent Followers, %		25.8
Segment Travel Time, minutes		0.26	Follower Density (FD), followers/mi/ln		0.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		184	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.73	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		799
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		184	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		3.08
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.11
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29347	PF Power Coefficient (p)		0.75789
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.8
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	799	-	-	68.4
Vehicle Results					
Average Speed, mi/h		68.4	Percent Followers, %		30.1
Segment Travel Time, minutes		0.13	Follower Density (FD), followers/mi/ln		0.8
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		184	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.73	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 12					

Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		857
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		184	Opposing Demand Flow Rate, veh/h		100
Peak Hour Factor		0.88	Total Trucks, %		3.08
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.11
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.27591	Speed Power Coefficient (p)		0.57423
PF Slope Coefficient (m)		-1.20974	PF Power Coefficient (p)		0.81565
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	857	-	-	69.0
Vehicle Results					
Average Speed, mi/h		69.0	Percent Followers, %		26.2
Segment Travel Time, minutes		0.14	Follower Density (FD), followers/mi/ln		0.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		184	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.73	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1288
Measured FFS		Measured	Free-Flow Speed, mi/h		60.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		184	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		3.08
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.11
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		60.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.39671	PF Power Coefficient (p)		0.73647

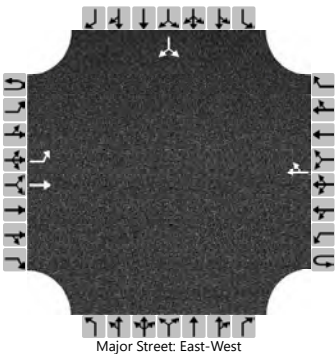




HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD 38 & SD 19
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/5/2023	East/West Street	SD 38
Analysis Year	2040	North/South Street	SD 19
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	0	1	0		0	0	0		0	1	0
Configuration		L	T					TR							LR	
Volume (veh/h)		45	135				100	40						55		75
Percent Heavy Vehicles (%)		30												9		11
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)		4.40												6.49		6.31
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.47												3.58		3.40

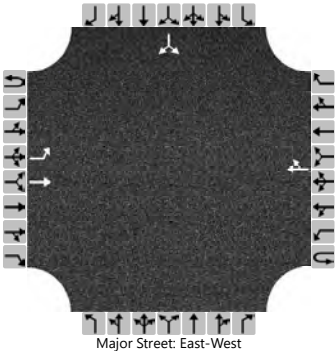
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		49													141	
Capacity, c (veh/h)		1274													734	
v/c Ratio		0.04													0.19	
95% Queue Length, Q ₉₅ (veh)		0.1													0.7	
Control Delay (s/veh)		7.9													11.1	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	2.0												11.1			
Approach LOS	A												B			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD 38 & SD 19
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/5/2023	East/West Street	SD 38
Analysis Year	2040	North/South Street	SD 19
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	0	1	0		0	0	0		0	1	0
Configuration		L	T					TR							LR	
Volume (veh/h)		70	100				140	65						30		40
Percent Heavy Vehicles (%)		2												10		14
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)		4.12												6.50		6.34
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.59		3.43

Delay, Queue Length, and Level of Service

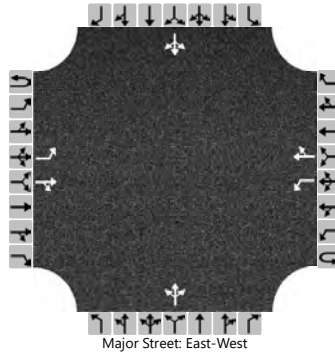
Flow Rate, v (veh/h)		76													76	
Capacity, c (veh/h)		1345													661	
v/c Ratio		0.06													0.12	
95% Queue Length, Q ₉₅ (veh)		0.2													0.4	
Control Delay (s/veh)		7.8													11.2	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	3.2												11.2			
Approach LOS	A												B			

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & 459th
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/5/2023	East/West Street	SD 38
Analysis Year	2040	North/South Street	459th Ave
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		0	180	6		1	130	0		10	0	6		7	0	0
Percent Heavy Vehicles (%)		3				3				13	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.13				4.13				7.23	6.50	6.20		7.10	6.50	6.20
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)		2.23				2.23				3.62	4.00	3.30		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

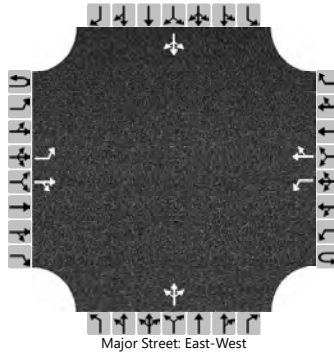
Flow Rate, v (veh/h)		0				1					17				8	
Capacity, c (veh/h)		1436				1364					667				613	
v/c Ratio		0.00				0.00					0.03				0.01	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.1				0.0	
Control Delay (s/veh)		7.5				7.6					10.5				10.9	
Level of Service (LOS)		A				A					B				B	
Approach Delay (s/veh)	0.0				0.1				10.5				10.9			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & 459th
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/5/2023	East/West Street	SD 38
Analysis Year	2040	North/South Street	459th Ave
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		0	120	7		10	205	1		10	0	3		1	1	0
Percent Heavy Vehicles (%)		0				0				13	0	0		0	100	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.10				7.23	6.50	6.20		7.10	7.50	6.20
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)		2.20				2.20				3.62	4.00	3.30		3.50	4.90	3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				11					14				2	
Capacity, c (veh/h)		1357				1458					609				488	
v/c Ratio		0.00				0.01					0.02				0.00	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.1				0.0	
Control Delay (s/veh)		7.7				7.5					11.0				12.4	
Level of Service (LOS)		A				A					B				B	
Approach Delay (s/veh)	0.0				0.3				11.0				12.4			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

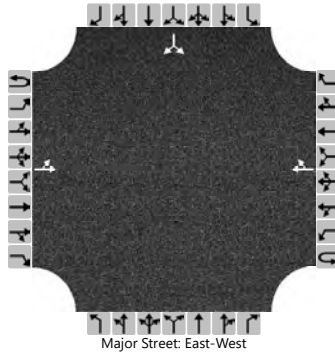
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/5/2023
Analysis Year	2040
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & I-90 Expressway
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	I-90 Expressway
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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		0	190				140	0						0		0
Percent Heavy Vehicles (%)		3												3		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

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

Delay, Queue Length, and Level of Service

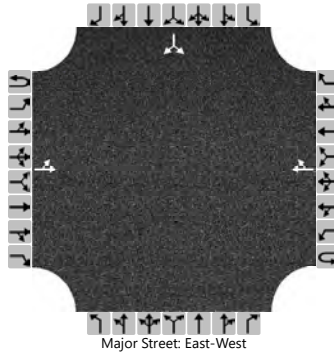
Flow Rate, v (veh/h)		0													0	
Capacity, c (veh/h)		1422													0	
v/c Ratio		0.00														
95% Queue Length, Q ₉₅ (veh)		0.0														
Control Delay (s/veh)		7.5	0.0													
Level of Service (LOS)		A	A													
Approach Delay (s/veh)	0.0															
Approach LOS	A															

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & I-90 Expressway
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/5/2023	East/West Street	SD 38
Analysis Year	2040	North/South Street	I-90 Expressway
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		0	135				215	0						0		0
Percent Heavy Vehicles (%)		3												3		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

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

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0													0	
Capacity, c (veh/h)		1328													0	
v/c Ratio		0.00														
95% Queue Length, Q ₉₅ (veh)		0.0														
Control Delay (s/veh)		7.7	0.0													
Level of Service (LOS)		A	A													
Approach Delay (s/veh)	0.0															
Approach LOS	A															

HCS Two-Way Stop-Control Report

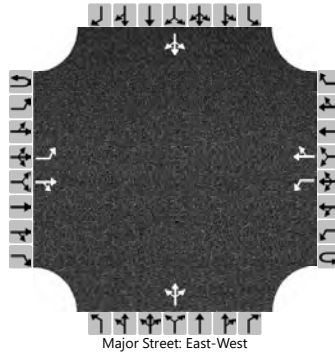
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/5/2023
Analysis Year	2040
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & 463rd Ave / Western Ave
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	463rd Ave / Western Ave
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	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		7	150	65		50	95	25		50	65	75		35	65	4
Percent Heavy Vehicles (%)		3				3				14	2	6		0	7	33
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.13				4.13				7.24	6.52	6.26		7.10	6.57	6.53
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)		2.23				2.23				3.63	4.02	3.35		3.50	4.06	3.60

Delay, Queue Length, and Level of Service

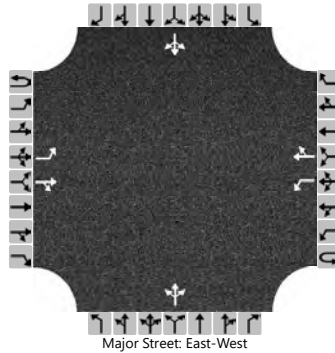
Flow Rate, v (veh/h)		8				54					207				113	
Capacity, c (veh/h)		1449				1328					541				442	
v/c Ratio		0.01				0.04					0.38				0.26	
95% Queue Length, Q ₉₅ (veh)		0.0				0.1					1.8				1.0	
Control Delay (s/veh)		7.5				7.8					15.7				15.9	
Level of Service (LOS)		A				A					C				C	
Approach Delay (s/veh)	0.2				2.3				15.7				15.9			
Approach LOS	A				A				C				C			

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & 463rd Ave / Western Ave
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/5/2023	East/West Street	SD 38
Analysis Year	2040	North/South Street	463rd Ave / Western Ave
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		15	105	45		95	165	50		55	70	125		45	80	20
Percent Heavy Vehicles (%)		22				3				0	11	4		0	4	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.32				4.13				7.10	6.61	6.24		7.10	6.54	6.20
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)		2.40				2.23				3.50	4.10	3.34		3.50	4.04	3.30

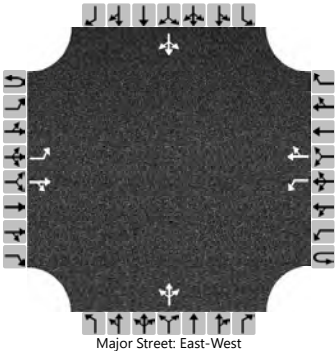
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		16				103					272				158	
Capacity, c (veh/h)		1225				1410					480				353	
v/c Ratio		0.01				0.07					0.57				0.45	
95% Queue Length, Q ₉₅ (veh)		0.0				0.2					3.5				2.2	
Control Delay (s/veh)		8.0				7.8					21.9				23.2	
Level of Service (LOS)		A				A					C				C	
Approach Delay (s/veh)	0.7				2.4				21.9				23.2			
Approach LOS	A				A				C				C			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD 38 & Main Ave
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/5/2023	East/West Street	SD 38
Analysis Year	2040	North/South Street	Main Ave (9th St)
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		1	215	25		35	165	15		30	4	70		5	9	3
Percent Heavy Vehicles (%)		0				11				5	0	2		0	17	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.21				7.15	6.50	6.22		7.10	6.67	6.20
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)		2.20				2.30				3.55	4.00	3.32		3.50	4.15	3.30

Delay, Queue Length, and Level of Service

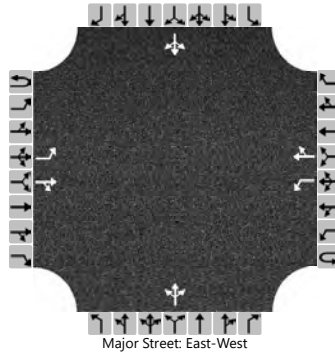
Flow Rate, v (veh/h)		1				38					113				18	
Capacity, c (veh/h)		1389				1253					630				463	
v/c Ratio		0.00				0.03					0.18				0.04	
95% Queue Length, Q ₉₅ (veh)		0.0				0.1					0.6				0.1	
Control Delay (s/veh)		7.6				8.0					12.0				13.1	
Level of Service (LOS)		A				A					B				B	
Approach Delay (s/veh)	0.0				1.3				12.0				13.1			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & Main Ave
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/4/2023	East/West Street	SD 38
Analysis Year	2040	North/South Street	Main Ave (9th St)
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		9	210	40		55	275	50		30	15	45		35	25	6
Percent Heavy Vehicles (%)		0				0				5	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.10				7.15	6.50	6.20		7.10	6.50	6.20
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)		2.20				2.20				3.55	4.00	3.30		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

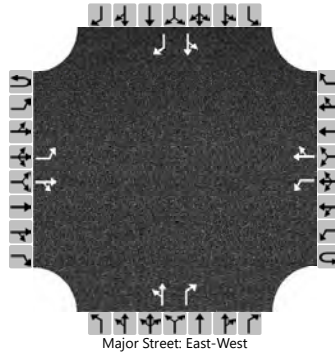
Flow Rate, v (veh/h)		10				60					98				72	
Capacity, c (veh/h)		1217				1303					446				329	
v/c Ratio		0.01				0.05					0.22				0.22	
95% Queue Length, Q ₉₅ (veh)		0.0				0.1					0.8				0.8	
Control Delay (s/veh)		8.0				7.9					15.3				19.0	
Level of Service (LOS)		A				A					C				C	
Approach Delay (s/veh)	0.3				1.1				15.3				19.0			
Approach LOS	A				A				C				C			

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & Vandemark Ave
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/5/2023	East/West Street	SD 38
Analysis Year	2040	North/South Street	Vandemark Avenue
Time Analyzed	AM	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	0		0	1	1		0	1	1
Configuration		L		TR		L		TR		LT		R		LT		R
Volume (veh/h)		20	310	9		7	210	20		7	4	10		35	1	20
Percent Heavy Vehicles (%)		0				0				40	0	0		0	0	7
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized									No				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)		4.10				4.10				7.50	6.50	6.20		7.10	6.50	6.27
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)		2.20				2.20				3.86	4.00	3.30		3.50	4.00	3.36

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		22				8				12		11		39		22
Capacity, c (veh/h)		1327				1223				345		705		374		788
v/c Ratio		0.02				0.01				0.03		0.02		0.10		0.03
95% Queue Length, Q ₉₅ (veh)		0.0				0.0				0.1		0.0		0.3		0.1
Control Delay (s/veh)		7.8				8.0				15.8		10.2		15.7		9.7
Level of Service (LOS)		A				A				C		B		C		A
Approach Delay (s/veh)	0.5				0.2				13.1				13.6			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

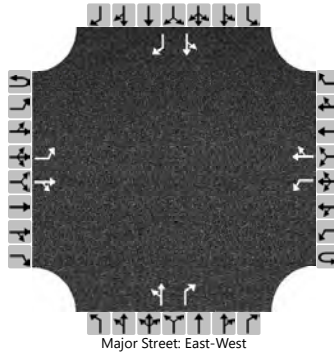
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/5/2023
Analysis Year	2040
Time Analyzed	PM
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & Vandemark Ave
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	Vandemark Avenue
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	0	0	1	1	0		0	1	1		0	1	1
Configuration		L		TR		L		TR		LT		R		LT		R
Volume (veh/h)		20	220	3		5	400	35		0	0	8		25	0	20
Percent Heavy Vehicles (%)		0				0				0	0	100		0	0	7
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized									No				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)		4.10				4.10				7.10	6.50	7.20		7.10	6.50	6.27
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)		2.20				2.20				3.50	4.00	4.20		3.50	4.00	3.36

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		22				5				0		9		27		22
Capacity, c (veh/h)		1100				1336				0		607		319		596
v/c Ratio		0.02				0.00						0.01		0.09		0.04
95% Queue Length, Q ₉₅ (veh)		0.1				0.0						0.0		0.3		0.1
Control Delay (s/veh)		8.3				7.7						11.0		17.3		11.3
Level of Service (LOS)		A				A						B		C		B
Approach Delay (s/veh)	0.7				0.1								14.6			
Approach LOS	A				A								B			

HCS Two-Way Stop-Control Report

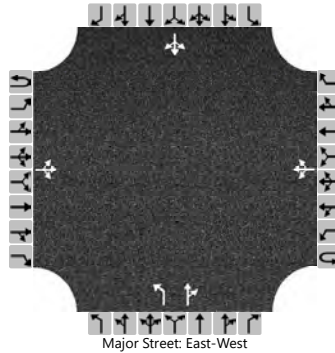
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/5/2023
Analysis Year	2040
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & 2nd St
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	2nd St
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	0	1	0	0	0	1	0		1	1	0		0	1	0
Configuration			LTR				LTR			L		TR			LTR	
Volume (veh/h)		15	275	9		80	175	15		4	20	130		30	40	20
Percent Heavy Vehicles (%)		10				16				33	8	5		0	4	8
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.20				4.26				7.43	6.58	6.25		7.10	6.54	6.28
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)		2.29				2.34				3.80	4.07	3.35		3.50	4.04	3.37

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		16				87				4		163			98	
Capacity, c (veh/h)		1292				1177				234		616			320	
v/c Ratio		0.01				0.07				0.02		0.26			0.31	
95% Queue Length, Q ₉₅ (veh)		0.0				0.2				0.1		1.1			1.3	
Control Delay (s/veh)		7.8	0.1	0.1		8.3	0.7	0.7		20.7		12.9			21.2	
Level of Service (LOS)		A	A	A		A	A	A		C		B			C	
Approach Delay (s/veh)	0.5				2.9				13.1				21.2			
Approach LOS	A				A				B				C			

HCS Two-Way Stop-Control Report

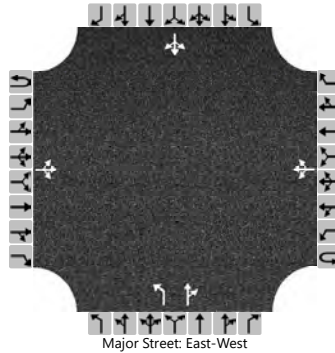
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/5/2023
Analysis Year	2040
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & 2nd St
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	2nd St
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	0	1	0	0	0	1	0		1	1	0		0	1	0
Configuration			LTR				LTR			L		TR			LTR	
Volume (veh/h)		20	200	7		110	415	20		10	20	55		15	25	15
Percent Heavy Vehicles (%)		0				0				0	0	6		0	6	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.10				7.10	6.50	6.26		7.10	6.56	6.20
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)		2.20				2.20				3.50	4.00	3.35		3.50	4.05	3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		22				120				11		82			60	
Capacity, c (veh/h)		1078				1356				174		462			234	
v/c Ratio		0.02				0.09				0.06		0.18			0.26	
95% Queue Length, Q ₉₅ (veh)		0.1				0.3				0.2		0.6			1.0	
Control Delay (s/veh)		8.4	0.2	0.2		7.9	0.9	0.9		27.1		14.5			25.6	
Level of Service (LOS)		A	A	A		A	A	A		D		B			D	
Approach Delay (s/veh)	0.9				2.4				15.9				25.6			
Approach LOS	A				A				C				D			

HCS Two-Way Stop-Control Report

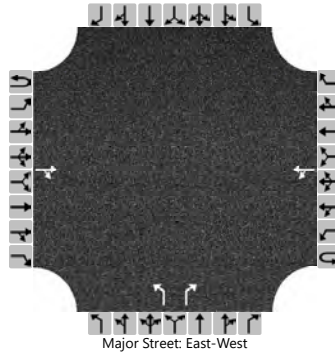
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/8/2023
Analysis Year	2040
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & West Central HS Entrance
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	West Central HS Entrance
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	0	1	0	0	0	1	0		1	0	1		0	0	0
Configuration				TR		LT				L		R				
Volume (veh/h)			360	75		45	245			30		40				
Percent Heavy Vehicles (%)						0				0		0				
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)						4.10				6.40		6.20				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.20				3.50		3.30				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						49				33		43				
Capacity, c (veh/h)						1100				340		628				
v/c Ratio						0.04				0.10		0.07				
95% Queue Length, Q ₉₅ (veh)						0.1				0.3		0.2				
Control Delay (s/veh)						8.4	0.4			16.7		11.2				
Level of Service (LOS)						A	A			C		B				
Approach Delay (s/veh)					1.7				13.5							
Approach LOS					A				B							

HCS Two-Way Stop-Control Report

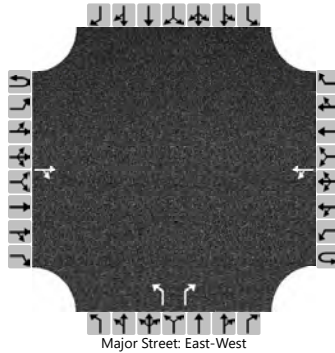
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/8/2023
Analysis Year	2040
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & West Central HS Entrance
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	West Central HS Entrance
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	0	1	0	0	0	1	0		1	0	1		0	0	0
Configuration				TR		LT				L		R				
Volume (veh/h)			265	3		3	525			10		10				
Percent Heavy Vehicles (%)						0				0		0				
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)						4.10				6.40		6.20				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.20				3.50		3.30				

Delay, Queue Length, and Level of Service

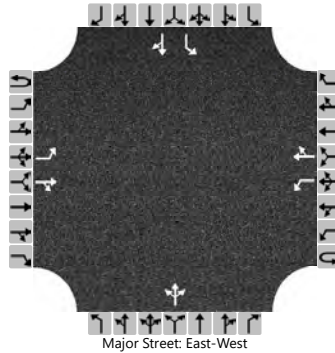
Flow Rate, v (veh/h)						3				11		11				
Capacity, c (veh/h)						1282				325		754				
v/c Ratio						0.00				0.03		0.01				
95% Queue Length, Q ₉₅ (veh)						0.0				0.1		0.0				
Control Delay (s/veh)						7.8	0.0			16.5		9.8				
Level of Service (LOS)						A	A			C		A				
Approach Delay (s/veh)					0.1				13.2							
Approach LOS					A				B							

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & Railroad Street
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/8/2023	East/West Street	SD 38
Analysis Year	2040	North/South Street	Railroad St
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	0		0	1	0		1	1	0
Configuration		L		TR		L		TR			LTR			L		TR
Volume (veh/h)		3	390	0		15	235	80		1	0	25		125	3	4
Percent Heavy Vehicles (%)		0				0				0	0	15		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.10				7.10	6.50	6.35		7.10	6.50	6.20
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)		2.20				2.20				3.50	4.00	3.44		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

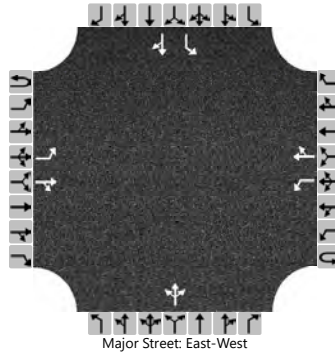
Flow Rate, v (veh/h)		3				16					28			136		8
Capacity, c (veh/h)		1228				1146					585			304		485
v/c Ratio		0.00				0.01					0.05			0.45		0.02
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.2			2.2		0.0
Control Delay (s/veh)		7.9				8.2					11.5			26.0		12.5
Level of Service (LOS)		A				A					B			D		B
Approach Delay (s/veh)	0.1				0.4				11.5				25.3			
Approach LOS	A				A				B				D			

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & Railroad Street
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/5/2023	East/West Street	SD 38
Analysis Year	2040	North/South Street	Railroad St
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	0		0	1	0		1	1	0
Configuration		L		TR		L		TR			LTR			L		TR
Volume (veh/h)		3	295	3		10	475	130		1	1	10		70	7	4
Percent Heavy Vehicles (%)		0				40				0	0	15		5	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.50				7.10	6.50	6.35		7.15	6.50	6.20
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)		2.20				2.56				3.50	4.00	3.44		3.55	4.00	3.30


















Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		3				11					13				76		12
Capacity, c (veh/h)		940				1050					533				234		319
v/c Ratio		0.00				0.01					0.02				0.33		0.04
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.1				1.4		0.1
Control Delay (s/veh)		8.8				8.5					11.9				27.6		16.7
Level of Service (LOS)		A				A					B				D		C
Approach Delay (s/veh)	0.1				0.1				11.9				26.2				
Approach LOS	A				A				B				D				

HCS Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	HRG			Duration, h	0.250	
Analyst	NM	Analysis Date	May 8, 2023	Area Type	Other	
Jurisdiction	SDDOT	Time Period	AM Peak	PHF	0.92	
Urban Street	SD 38	Analysis Year	2040	Analysis Period	1> 7:15	
Intersection	SD 38 & Mickelson Roa...	File Name	(10) SD38&Mickelson_AM.xus			
Project Description						

Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	135	355	30	35	140	190	35	55	50	215	20	195

Signal Information														
Cycle, s	65.0	Reference Phase	2											
Offset, s	0	Reference Point	End	Green	2.5	3.0	17.5	2.5	2.5	18.0				
Uncoordinated	No	Simult. Gap E/W	On	Yellow	3.5	0.0	4.0	3.5	0.0	4.0				
Force Mode	Fixed	Simult. Gap N/S	On	Red	1.0	0.0	1.0	1.0	0.0	1.0				

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	1.1	4.0
Phase Duration, s	10.0	25.5	7.0	22.5	7.0	23.0	9.5	25.5
Change Period, ($Y+R_c$), s	4.5	5.0	4.5	5.0	4.5	5.0	4.5	5.0
Max Allow Headway (MAH), s	3.1	0.0	3.1	0.0	3.1	3.3	3.1	3.3
Queue Clearance Time (g_s), s	6.0		3.0		3.0	20.0	7.0	22.5
Green Extension Time (g_e), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Phase Call Probability	0.93		0.50		0.50	1.00	0.99	1.00
Max Out Probability	1.00		1.00		1.00	1.00	1.00	1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	147	418		38	152	207	38	114		234	234	
Adjusted Saturation Flow Rate (s), veh/h/ln	1688	1747		1688	1772	1323	1688	1632		1688	1523	
Queue Service Time (g_s), s	4.0	14.0		1.0	4.5	8.8	1.0	3.5		5.0	8.1	
Cycle Queue Clearance Time (g_c), s	4.0	14.0		1.0	4.5	8.8	1.0	3.5		5.0	8.1	
Green Ratio (g/C)	0.36	0.32		0.31	0.27	0.27	0.32	0.28		0.35	0.32	
Capacity (c), veh/h	501	552		175	477	356	175	452		241	481	
Volume-to-Capacity Ratio (X)	0.293	0.759		0.217	0.319	0.580	0.217	0.253		0.971	0.486	
Back of Queue (Q), ft/ln (95 th percentile)												
Back of Queue (Q), veh/ln (95 th percentile)	2.4	10.7		0.7	3.4	5.6	0.7	2.2		9.5	4.7	
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00		0.00	0.00	0.00	0.00	0.00		0.00	0.00	
Uniform Delay (d_1), s/veh	14.7	20.0		18.3	19.0	20.6	18.1	18.3		21.1	18.0	
Incremental Delay (d_2), s/veh	0.1	9.4		0.2	1.8	6.7	0.2	0.1		49.6	0.3	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	14.8	29.5		18.5	20.7	27.3	18.3	18.4		70.7	18.3	
Level of Service (LOS)	B	C		B	C	C	B	B		E	B	
Approach Delay, s/veh / LOS	25.7	C		23.9	C		18.4	B		44.5	D	
Intersection Delay, s/veh / LOS	30.1						C					

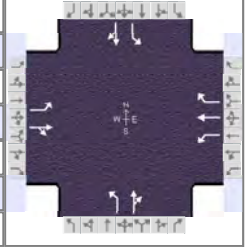
Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.91	B	1.91	B	2.10	B	1.91	B
Bicycle LOS Score / LOS	1.42	A	1.14	A	0.74	A	1.26	A

HCS Signalized Intersection Results Summary

General Information

Agency	HRG		
Analyst	NM	Analysis Date	May 8, 2023
Jurisdiction	SDDOT	Time Period	AM Peak
Urban Street	SD 38	Analysis Year	2040
Intersection	SD 38 & Mickelson Roa...	File Name	(10) SD38&Mickelson
Project Description			

Intersection Information



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	160	165	20	110	425	225	15	65	35	210	15	185

Signal Information

Cycle, s	70.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On	Green	4.8	1.7	21.0	1.4	0.6	17.0		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.5	0.0	4.0	3.5	3.5	4.0		
				Red	1.0	0.0	1.0	1.0	1.0	1.0		

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	1.1	4.0
Phase Duration, s	11.0	27.7	9.3	26.0	5.9	22.0	11.0	27.1
Change Period, ($Y+R_c$), s	4.5	5.0	4.5	5.0	4.5	5.0	4.5	5.0
Max Allow Headway (MAH), s	3.1	0.0	3.1	0.0	3.1	3.3	3.1	3.3
Queue Clearance Time (g_s), s	6.9		5.4		2.5	19.0	8.5	24.1
Green Extension Time (g_e), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Phase Call Probability	0.97		0.90		0.27	1.00	0.99	1.00
Max Out Probability	1.00		1.00		1.00	1.00	1.00	1.00

Movement Group Results

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	174	201		120	462	245	16	109		228	217	
Adjusted Saturation Flow Rate (s), veh/h/ln	1688	1738		1688	1772	1323	1688	1667		1688	1519	
Queue Service Time (g_s), s	4.9	6.2		3.4	17.3	11.1	0.5	3.7		6.5	8.0	
Cycle Queue Clearance Time (g_c), s	4.9	6.2		3.4	17.3	11.1	0.5	3.7		6.5	8.0	
Green Ratio (g/C)	0.39	0.32		0.37	0.30	0.30	0.26	0.24		0.36	0.32	
Capacity (c), veh/h	309	563		220	532	397	136	405		260	480	
Volume-to-Capacity Ratio (X)	0.563	0.357		0.544	0.869	0.616	0.120	0.268		0.879	0.452	
Back of Queue (Q), ft/ln (95 th percentile)												
Back of Queue (Q), veh/ln (95 th percentile)	3.2	4.6		2.2	14.1	7.0	0.3	2.5		7.8	4.7	
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00		0.00	0.00	0.00	0.00	0.00		0.00	0.00	
Uniform Delay (d_1), s/veh	17.0	18.1		18.1	23.2	21.0	21.3	21.5		19.7	19.1	
Incremental Delay (d_2), s/veh	1.5	1.8		0.9	17.4	7.0	0.1	0.1		26.4	0.2	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	18.5	19.9		19.1	40.6	28.0	21.4	21.6		46.2	19.3	
Level of Service (LOS)	B	B		B	D	C	C	C		D	B	
Approach Delay, s/veh / LOS	19.2		B	33.7		C	21.6		C	33.1		C
Intersection Delay, s/veh / LOS	29.6						C					

Multimodal Results

	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	1.91		B	1.91		B	2.11		B	1.91		B
Bicycle LOS Score / LOS	1.11		A	1.85		B	0.69		A	1.22		A

HCS Two-Way Stop-Control Report

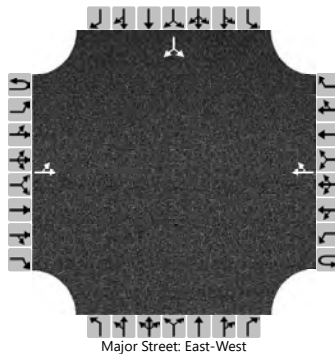
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/8/2023
Analysis Year	2040
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD38 & 466th Ave
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	466th Ave
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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		1	650				370	4						3		0
Percent Heavy Vehicles (%)		0												50		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.90		6.23
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.95		3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		1													3	
Capacity, c (veh/h)		1163													187	
v/c Ratio		0.00													0.02	
95% Queue Length, Q ₉₅ (veh)		0.0													0.1	
Control Delay (s/veh)		8.1	0.0												24.6	
Level of Service (LOS)		A	A												C	
Approach Delay (s/veh)	0.0												24.6			
Approach LOS	A												C			

HCS Two-Way Stop-Control Report

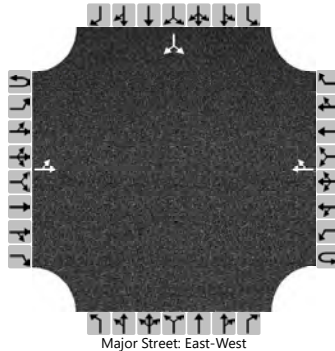
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/8/2023
Analysis Year	2040
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD38 & 466th Ave
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	466th Ave
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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		0	380				770	1						4		1
Percent Heavy Vehicles (%)		0												33		0
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)		4.10												6.73		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.80		3.30

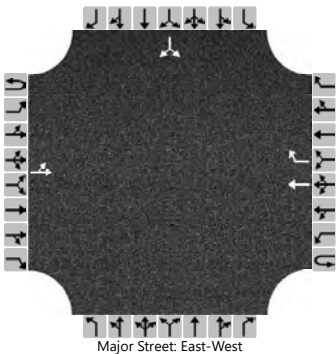
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0													5	
Capacity, c (veh/h)		805													185	
v/c Ratio		0.00													0.03	
95% Queue Length, Q ₉₅ (veh)		0.0													0.1	
Control Delay (s/veh)		9.5	0.0												25.0	
Level of Service (LOS)		A	A												D	
Approach Delay (s/veh)	0.0												25.0			
Approach LOS	A												D			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD 38 & I-90 WB Terminal
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/8/2023	East/West Street	SD 38
Analysis Year	2040	North/South Street	I-90 WB Terminal
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	1		0	0	0		0	1	0
Configuration		LT					T	R							LR	
Volume (veh/h)		35	615				215	15						15		165
Percent Heavy Vehicles (%)		0												56		12
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)		4.10												6.96		6.32
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												4.00		3.41

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		38													196	
Capacity, c (veh/h)		1327													639	
v/c Ratio		0.03													0.31	
95% Queue Length, Q ₉₅ (veh)		0.1													1.3	
Control Delay (s/veh)		7.8	0.4												13.1	
Level of Service (LOS)		A	A												B	
Approach Delay (s/veh)	0.8												13.1			
Approach LOS	A												B			

HCS Two-Way Stop-Control Report

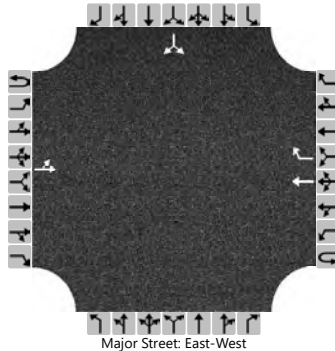
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/8/2023
Analysis Year	2040
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & I-90 WB Terminal
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	I-90 WB Terminal
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	0	1	0	0	0	1	1		0	0	0		0	1	0
Configuration		LT					T	R							LR	
Volume (veh/h)		25	355				355	30						25		415
Percent Heavy Vehicles (%)		0												6		2
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)		4.10												6.46		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.55		3.32

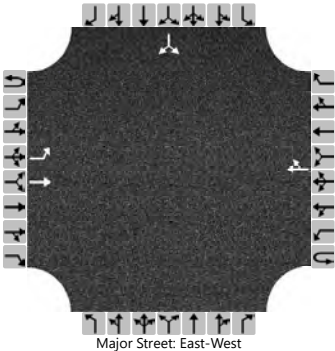
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		27													478	
Capacity, c (veh/h)		1151													625	
v/c Ratio		0.02													0.76	
95% Queue Length, Q ₉₅ (veh)		0.1													7.0	
Control Delay (s/veh)		8.2	0.2												27.0	
Level of Service (LOS)		A	A												D	
Approach Delay (s/veh)	0.8												27.0			
Approach LOS	A												D			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD 38 & I-90 EB Ramp Terminal
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/8/2023	East/West Street	SD 38
Analysis Year	2040	North/South Street	I-90 EB Ramp Terminal
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	0	1	0		0	0	0		0	1	0
Configuration		L	T					TR							LR	
Volume (veh/h)		365	265				210	20						4		25
Percent Heavy Vehicles (%)		1												33		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.11												6.73		6.23
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.21												3.80		3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		397													32	
Capacity, c (veh/h)		1321													416	
v/c Ratio		0.30													0.08	
95% Queue Length, Q ₉₅ (veh)		1.3													0.2	
Control Delay (s/veh)		8.9													14.4	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	5.1												14.4			
Approach LOS	A												B			

HCS Two-Way Stop-Control Report

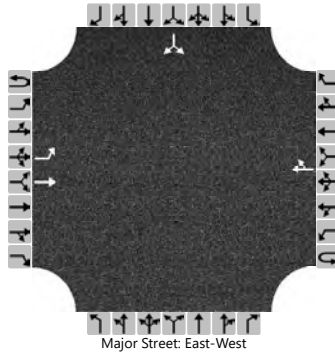
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/8/2023
Analysis Year	2040
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & I-90 EB Ramp Terminal
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	I-90 EB Ramp Terminal
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	0	0	0	1	0		0	0	0		0	1	0
Configuration		L	T					TR							LR	
Volume (veh/h)		165	225				355	25						35		35
Percent Heavy Vehicles (%)		12												36		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.22												6.76		6.23
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.31												3.82		3.33

Delay, Queue Length, and Level of Service

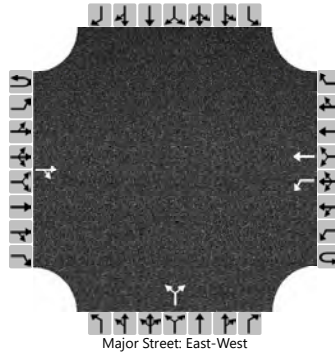
Flow Rate, v (veh/h)		179													76	
Capacity, c (veh/h)		1094													299	
v/c Ratio		0.16													0.25	
95% Queue Length, Q ₉₅ (veh)		0.6													1.0	
Control Delay (s/veh)		8.9													21.1	
Level of Service (LOS)		A													C	
Approach Delay (s/veh)	3.8												21.1			
Approach LOS	A												C			

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & 466th Ave (South)
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/8/2023	East/West Street	SD 38
Analysis Year	2040	North/South Street	466th Ave (South)
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	1	1	0		0	1	0		0	0	0
Configuration				TR		L	T				LR					
Volume (veh/h)			260	15		15	200			20		15				
Percent Heavy Vehicles (%)						20				33		60				
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)						4.30				6.73		6.80				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.38				3.80		3.84				

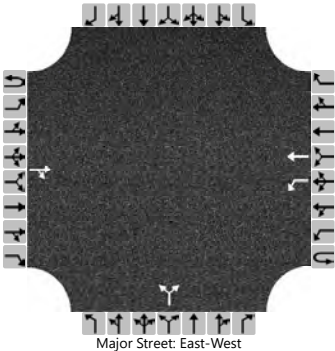
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					16					38						
Capacity, c (veh/h)					1166					510						
v/c Ratio					0.01					0.07						
95% Queue Length, Q ₉₅ (veh)					0.0					0.2						
Control Delay (s/veh)					8.1					12.6						
Level of Service (LOS)					A					B						
Approach Delay (s/veh)					0.6				12.6							
Approach LOS					A				B							

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD 38 & 466th Ave (South)
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/8/2023	East/West Street	SD 38
Analysis Year	2040	North/South Street	466th Ave (South)
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	1	1	0		0	1	0		0	0	0
Configuration				TR		L	T				LR					
Volume (veh/h)			235	20		15	340			35		20				
Percent Heavy Vehicles (%)						11				20		0				
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)						4.21					6.60		6.20			
Base Follow-Up Headway (sec)						2.2					3.5		3.3			
Follow-Up Headway (sec)						2.30					3.68		3.30			

Delay, Queue Length, and Level of Service

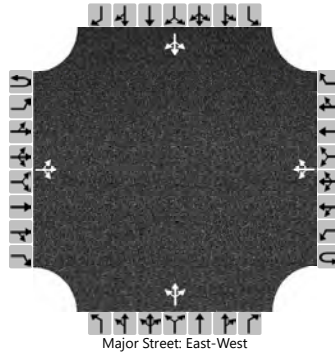
Flow Rate, v (veh/h)						16						60				
Capacity, c (veh/h)						1236						477				
v/c Ratio						0.01						0.13				
95% Queue Length, Q ₉₅ (veh)						0.0						0.4				
Control Delay (s/veh)						8.0						13.6				
Level of Service (LOS)						A						B				
Approach Delay (s/veh)					0.3				13.6							
Approach LOS					A				B							

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & 468th Avenue
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/8/2023	East/West Street	SD 38
Analysis Year	2040	North/South Street	468th Ave / County Highway 141
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		3	300	0		0	190	40		1	1	0		40	0	6
Percent Heavy Vehicles (%)		0				0				0	100	0		4	0	50
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.10				7.10	7.50	6.20		7.14	6.50	6.70
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)		2.20				2.20				3.50	4.90	3.30		3.54	4.00	3.75

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		3				0					2				50	
Capacity, c (veh/h)		1327				1245					371				455	
v/c Ratio		0.00				0.00					0.01				0.11	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.0				0.4	
Control Delay (s/veh)		7.7	0.0	0.0		7.9	0.0	0.0			14.8				13.9	
Level of Service (LOS)		A	A	A		A	A	A			B				B	
Approach Delay (s/veh)	0.1				0.0				14.8				13.9			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

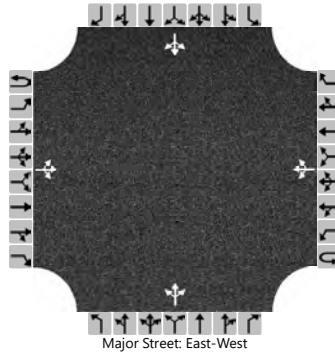
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/8/2023
Analysis Year	2040
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & 468th Avenue
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	468th Ave / County Highway 141
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	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		0	260	1		4	350	45		1	1	0		45	3	3
Percent Heavy Vehicles (%)		0				0				0	0	0		4	100	50
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.10				7.10	6.50	6.20		7.14	7.50	6.70
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)		2.20				2.20				3.50	4.00	3.30		3.54	4.90	3.75

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				4					2				55	
Capacity, c (veh/h)		1141				1290					358				351	
v/c Ratio		0.00				0.00					0.01				0.16	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.0				0.6	
Control Delay (s/veh)		8.2	0.0	0.0		7.8	0.0	0.0			15.1				17.2	
Level of Service (LOS)		A	A	A		A	A	A			C				C	
Approach Delay (s/veh)	0.0				0.1				15.1				17.2			
Approach LOS	A				A				C				C			

HCS Two-Way Stop-Control Report

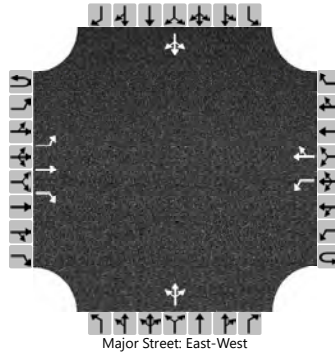
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/8/2023
Analysis Year	2040
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & 469th Ave
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	469th Ave / Co Hwy 139
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)		5	275	60		65	140	5		90	5	230		15	5	5
Percent Heavy Vehicles (%)		3				5				13	3	3		3	3	3
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)		4.13				4.15				7.23	6.53	6.23		7.13	6.53	6.23
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)		2.23				2.25				3.62	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		5				71					353				27	
Capacity, c (veh/h)		1416				1178					566				311	
v/c Ratio		0.00				0.06					0.62				0.09	
95% Queue Length, Q ₉₅ (veh)		0.0				0.2					4.3				0.3	
Control Delay (s/veh)		7.6				8.3					21.3				17.7	
Level of Service (LOS)		A				A					C				C	
Approach Delay (s/veh)	0.1				2.6				21.3				17.7			
Approach LOS	A				A				C				C			

HCS Two-Way Stop-Control Report

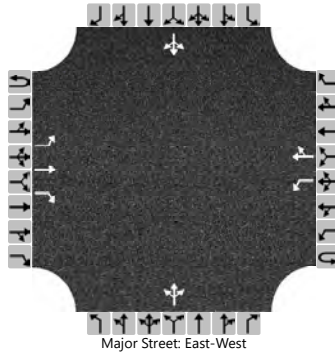
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/8/2023
Analysis Year	2040
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & 469th Ave
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	469th Ave / Co Hwy 139
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)		5	210	100		235	320	5		80	5	100		20	5	10
Percent Heavy Vehicles (%)		3				5				2	3	15		3	3	3
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)		4.13				4.15				7.12	6.53	6.35		7.13	6.53	6.23
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)		2.23				2.25				3.52	4.03	3.44		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		5				255					201					38
Capacity, c (veh/h)		1200				1206					256					166
v/c Ratio		0.00				0.21					0.79					0.23
95% Queue Length, Q ₉₅ (veh)		0.0				0.8					5.9					0.8
Control Delay (s/veh)		8.0				8.8					56.2					33.1
Level of Service (LOS)		A				A					F					D
Approach Delay (s/veh)	0.1				3.7				56.2				33.1			
Approach LOS	A				A				F				D			

HCS Two-Way Stop-Control Report

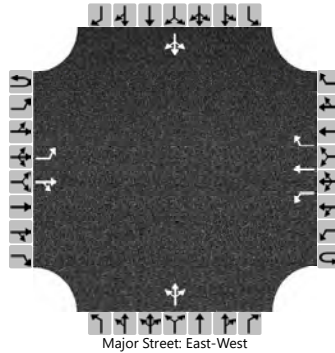
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/8/2023
Analysis Year	2040
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & La Mesa
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	La Mesa
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	0	0	1	1	1		0	1	0		0	1	0
Configuration		L		TR		L	T	R			LTR				LTR	
Volume (veh/h)		25	585	3		0	195	15		0	10	4		65	3	25
Percent Heavy Vehicles (%)		0				0				0	13	0		0	50	0
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)		4.10				4.10				7.10	6.63	6.20		7.10	7.00	6.20
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)		2.20				2.20				3.50	4.12	3.30		3.50	4.45	3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		27				0					15				101	
Capacity, c (veh/h)		1352				955					294				297	
v/c Ratio		0.02				0.00					0.05				0.34	
95% Queue Length, Q ₉₅ (veh)		0.1				0.0					0.2				1.5	
Control Delay (s/veh)		7.7				8.8					17.9				23.3	
Level of Service (LOS)		A				A					C				C	
Approach Delay (s/veh)	0.3				0.0				17.9				23.3			
Approach LOS	A				A				C				C			

HCS Two-Way Stop-Control Report

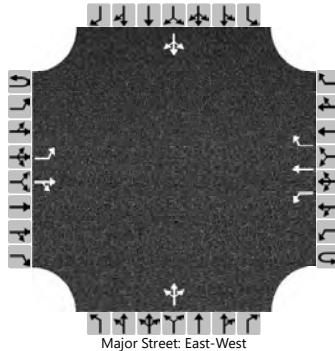
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/8/2023
Analysis Year	2040
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & La Mesa
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	La Mesa
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	0	0	1	1	1		0	1	0		0	1	0
Configuration		L		TR		L	T	R			LTR				LTR	
Volume (veh/h)		20	275	0		7	610	85		3	4	0		65	10	25
Percent Heavy Vehicles (%)		0				0				0	0	0		9	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized					No											
Median Type Storage	Undivided															

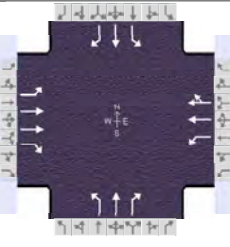
Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.1	6.5	6.2		7.1	6.5	6.2
Critical Headway (sec)		4.10				4.10				7.10	6.50	6.20		7.19	6.50	6.20
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)		2.20				2.20				3.50	4.00	3.30		3.58	4.00	3.30

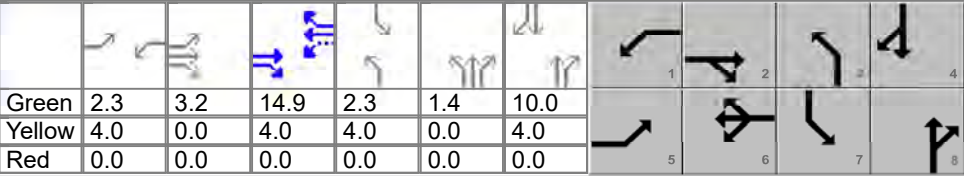
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		22				8					8				109	
Capacity, c (veh/h)		864				1274					196				234	
v/c Ratio		0.03				0.01					0.04				0.46	
95% Queue Length, Q ₉₅ (veh)		0.1				0.0					0.1				2.3	
Control Delay (s/veh)		9.3				7.8					24.1				33.0	
Level of Service (LOS)		A				A					C				D	
Approach Delay (s/veh)	0.6				0.1				24.1				33.0			
Approach LOS	A				A				C				D			

HCS Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	HRG			Duration, h	0.250	
Analyst	NM	Analysis Date	May 8, 2023	Area Type	Other	
Jurisdiction	SDDOT	Time Period	AM Peak	PHF	0.92	
Urban Street	SD 38	Analysis Year	2040	Analysis Period	1> 7:15	
Intersection	SD 38 & Marion Street	File Name	(18) SD38&Marion_AM.xus			
Project Description						

Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	135	285	85	40	105	60	90	190	100	40	120	35

Signal Information											
Cycle, s	50.0	Reference Phase	2		Green	2.3	3.2	14.9	2.3	1.4	10.0
Offset, s	0	Reference Point	End								
Uncoordinated	No	Simult. Gap E/W	On								
Force Mode	Fixed	Simult. Gap N/S	On								
				Yellow	4.0	0.0	4.0	4.0	0.0	4.0	
				Red	0.0	0.0	0.0	0.0	0.0	0.0	

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	2.0	3.0	1.1	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	9.4	22.0	6.3	18.9	7.7	15.4	6.3	14.0
Change Period, ($Y+R_c$), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Allow Headway (MAH), s	2.9	0.0	2.9	0.0	2.9	2.9	2.9	2.9
Queue Clearance Time (g_s), s	6.2		2.9		4.9	7.4	3.4	5.2
Green Extension Time (g_e), s	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.5
Phase Call Probability	0.87		0.45		0.74	1.00	0.45	1.00
Max Out Probability	1.00		0.01		1.00	0.10	1.00	0.06

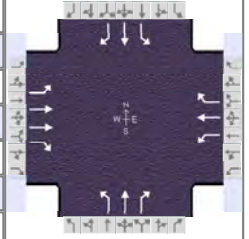
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	147	310	92	43	92	88	98	207	109	43	130	38
Adjusted Saturation Flow Rate (s), veh/h/ln	1701	1674	1525	1714	1772	1563	1647	1674	1502	1554	1758	1466
Queue Service Time (g_s), s	4.2	3.3	2.1	0.9	1.9	2.1	2.9	5.4	3.0	1.4	3.2	1.1
Cycle Queue Clearance Time (g_c), s	4.2	3.3	2.1	0.9	1.9	2.1	2.9	5.4	3.0	1.4	3.2	1.1
Green Ratio (g/C)	0.11	0.36	0.36	0.34	0.30	0.30	0.07	0.23	0.23	0.05	0.20	0.20
Capacity (c), veh/h	185	1207	550	499	526	464	122	383	344	70	351	293
Volume-to-Capacity Ratio (X)	0.794	0.257	0.168	0.087	0.174	0.189	0.799	0.539	0.316	0.617	0.371	0.130
Back of Queue (Q), ft/ln (95 th percentile)												
Back of Queue (Q), veh/ln (95 th percentile)	2.8	1.6	1.0	0.4	1.2	1.2	2.2	2.9	1.4	0.9	1.8	0.5
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	21.7	11.3	10.9	11.1	13.0	13.1	22.8	17.0	16.0	23.4	17.3	16.4
Incremental Delay (d_2), s/veh	4.2	0.5	0.7	0.0	0.7	0.9	8.2	0.4	0.2	3.2	0.2	0.1
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	25.9	11.8	11.5	11.2	13.7	14.0	31.0	17.4	16.2	26.7	17.5	16.5
Level of Service (LOS)	C	B	B	B	B	B	C	B	B	C	B	B
Approach Delay, s/veh / LOS	15.5	B		13.3	B		20.3	C		19.2	B	
Intersection Delay, s/veh / LOS	17.2						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.08	B	2.09	B	2.27	B	2.42	B
Bicycle LOS Score / LOS	0.94	A	0.67	A	1.17	A	0.84	A

HCS Signalized Intersection Results Summary

General Information

Agency	HRG		
Analyst	NM	Analysis Date	May 8, 2023
Jurisdiction	SDDOT	Time Period	PM Peak
Urban Street	SD 38	Analysis Year	2040
Intersection	SD 38 & Marion Street	File Name	(18) SD38&Marion
Project Description			



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	55	190	90	140	300	45	150	170	105	70	295	170

Signal Information

Cycle, s	50.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On	Green	2.9	2.7	12.0	3.3	2.2	10.9		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	0.0	4.0	4.0	0.0	4.0		
				Red	0.0	0.0	0.0	0.0	0.0	0.0		

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0
Phase Duration, s	6.9	16.0	9.6	18.7	9.5	17.1	7.3	14.9
Change Period, (Y+R _c), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Allow Headway (MAH), s	2.9	0.0	2.9	0.0	2.9	3.0	2.9	3.0
Queue Clearance Time (g _s), s	4.0		6.5		6.8	6.4	4.3	10.9
Green Extension Time (g _e), s	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Phase Call Probability	0.57		0.88		0.90	1.00	0.66	1.00
Max Out Probability	1.00		1.00		1.00	0.18	1.00	1.00

Movement Group Results

Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	61	211	100	156	333	50	167	189	117	78	328	189
Adjusted Saturation Flow Rate (s), veh/h/ln	1474	1660	1490	1688	1772	1406	1714	1772	1478	1688	1772	1478
Queue Service Time (g_s), s	2.0	2.6	2.7	4.5	8.2	1.3	4.8	4.4	3.2	2.3	8.9	5.7
Cycle Queue Clearance Time (g_c), s	2.0	2.6	2.7	4.5	8.2	1.3	4.8	4.4	3.2	2.3	8.9	5.7
Green Ratio (g/C)	0.06	0.24	0.24	0.11	0.29	0.29	0.11	0.26	0.26	0.07	0.22	0.22
Capacity (c), veh/h	84	797	358	189	522	414	189	464	387	111	387	322
Volume-to-Capacity Ratio (X)	0.725	0.265	0.280	0.824	0.638	0.121	0.884	0.407	0.301	0.698	0.848	0.586
Back of Queue (Q), ft/ln (95 th percentile)												
Back of Queue (Q), veh/ln (95 th percentile)	1.2	1.5	1.6	4.8	5.8	0.7	6.0	2.4	1.4	1.5	7.8	3.0
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	23.2	15.4	15.5	21.7	15.3	12.9	21.9	15.2	14.8	22.9	18.8	17.5
Incremental Delay (d_2), s/veh	4.4	0.8	1.9	23.3	5.9	0.6	34.4	0.2	0.2	2.9	15.1	1.8
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	27.5	16.2	17.4	45.0	21.2	13.5	56.4	15.5	14.9	25.8	33.8	19.3
Level of Service (LOS)	C	B	B	D	C	B	E	B	B	C	C	B
Approach Delay, s/veh / LOS	18.4	B		27.4	C		29.8	C		28.2	C	
Intersection Delay, s/veh / LOS	26.5						C					

Multimodal Results

	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	2.10	B		2.09	B		2.26	B		2.27	B	
Bicycle LOS Score / LOS	0.79	A		1.38	A		1.27	A		1.47	A	

HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	5/11/2023
Agency	HRG	Analysis Year	2040 NB
Jurisdiction	SDDOT	Time Analyzed	AM PEAK
Project Description	EB SD38 Corridor Study	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1084
Measured FFS	Measured	Free-Flow Speed, mi/h	55.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	480	Opposing Demand Flow Rate, veh/h	289
Peak Hour Factor	0.88	Total Trucks, %	2.16
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.28

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.0
Speed Slope Coefficient (m)	4.34836	Speed Power Coefficient (p)	0.51760
PF Slope Coefficient (m)	-1.34657	PF Power Coefficient (p)	0.76322
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.9
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1084	-	-	52.4

Vehicle Results

Average Speed, mi/h	52.4	Percent Followers, %	53.6
Segment Travel Time, minutes	0.24	Follower Density (FD), followers/mi/ln	4.9
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	480	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.84	Bicycle Effective Speed Factor	4.62
Bicycle LOS	C		

Segment 2

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	507
Measured FFS	Measured	Free-Flow Speed, mi/h	55.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		480	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.16
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.28
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		55.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.43973	PF Power Coefficient (p)		0.72475
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		5.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	507	-	-	51.9
Vehicle Results					
Average Speed, mi/h		51.9	Percent Followers, %		57.1
Segment Travel Time, minutes		0.11	Follower Density (FD), followers/mi/ln		5.3
Vehicle LOS		C			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		480	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.84	Bicycle Effective Speed Factor		4.62
Bicycle LOS		C			
Segment 3					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		535
Measured FFS		Measured	Free-Flow Speed, mi/h		55.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		480	Opposing Demand Flow Rate, veh/h		289
Peak Hour Factor		0.88	Total Trucks, %		2.16
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.28
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		55.0
Speed Slope Coefficient (m)		4.34836	Speed Power Coefficient (p)		0.51760
PF Slope Coefficient (m)		-1.34657	PF Power Coefficient (p)		0.76322
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		4.9
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	535	-	-	52.4

Vehicle Results

Average Speed, mi/h	52.4	Percent Followers, %	53.6
Segment Travel Time, minutes	0.12	Follower Density (FD), followers/mi/ln	4.9
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	480	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.84	Bicycle Effective Speed Factor	4.62
Bicycle LOS	C		

Segment 4

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1494
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	609	Opposing Demand Flow Rate, veh/h	323
Peak Hour Factor	0.88	Total Trucks, %	1.63
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.36

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.36176	Speed Power Coefficient (p)	0.51063
PF Slope Coefficient (m)	-1.25164	PF Power Coefficient (p)	0.80237
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	5.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1494	-	-	66.9

Vehicle Results

Average Speed, mi/h	66.9	Percent Followers, %	56.9
Segment Travel Time, minutes	0.25	Follower Density (FD), followers/mi/ln	5.2
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	609	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.96	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		5762
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		609	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		1.63
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.36
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.62977	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.20069	PF Power Coefficient (p)		0.78591
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		5.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5762	-	-	66.5
Vehicle Results					
Average Speed, mi/h		66.5	Percent Followers, %		55.7
Segment Travel Time, minutes		0.98	Follower Density (FD), followers/mi/ln		5.1
Vehicle LOS		C			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		609	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.96	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		383
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		614	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		1.89
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.36
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29361	PF Power Coefficient (p)	0.75772
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	5.4
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	383	-	-	66.5

Vehicle Results

Average Speed, mi/h	66.5	Percent Followers, %	59.1
Segment Travel Time, minutes	0.07	Follower Density (FD), followers/mi/ln	5.4
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	614	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.03	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 7

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1485
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	642	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	3.19
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.38

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57684	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.28453	PF Power Coefficient (p)	0.76145
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	5.8
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1485	-	-	66.5

Vehicle Results

Average Speed, mi/h	66.5	Percent Followers, %	60.0
Segment Travel Time, minutes	0.25	Follower Density (FD), followers/mi/ln	5.8
Vehicle LOS	C		

Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		642	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.39	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 8					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		426
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		306	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		6.47
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.18
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29307	PF Power Coefficient (p)		0.75839
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.8
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	426	-	-	67.6
Vehicle Results					
Average Speed, mi/h		67.6	Percent Followers, %		40.9
Segment Travel Time, minutes		0.07	Follower Density (FD), followers/mi/ln		1.8
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		306	Bicycle Effective Width, ft		24
Bicycle LOS Score		4.06	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 9					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1212
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					

Directional Demand Flow Rate, veh/h		291	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.17
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29321	PF Power Coefficient (p)		0.75821
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1212	-	-	67.7
Vehicle Results					
Average Speed, mi/h		67.7	Percent Followers, %		39.8
Segment Travel Time, minutes		0.20	Follower Density (FD), followers/mi/ln		1.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		291	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.62	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1877
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		291	Opposing Demand Flow Rate, veh/h		207
Peak Hour Factor		0.88	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.17
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.33123	Speed Power Coefficient (p)		0.53735
PF Slope Coefficient (m)		-1.21436	PF Power Coefficient (p)		0.81762
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	1877	-	-	68.2
Vehicle Results					
Average Speed, mi/h		68.2	Percent Followers, %		35.8
Segment Travel Time, minutes		0.31	Follower Density (FD), followers/mi/ln		1.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		291	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.62	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1872
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		291	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.17
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.58354	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.26676	PF Power Coefficient (p)		0.76864
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1872	-	-	67.7
Vehicle Results					
Average Speed, mi/h		67.7	Percent Followers, %		38.8
Segment Travel Time, minutes		0.31	Follower Density (FD), followers/mi/ln		1.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		291	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.62	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 12					

Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		3603
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		291	Opposing Demand Flow Rate, veh/h		207
Peak Hour Factor		0.88	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.17
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.35488	Speed Power Coefficient (p)		0.53735
PF Slope Coefficient (m)		-1.17100	PF Power Coefficient (p)		0.83467
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3603	-	-	68.2
Vehicle Results					
Average Speed, mi/h		68.2	Percent Followers, %		34.2
Segment Travel Time, minutes		0.60	Follower Density (FD), followers/mi/ln		1.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		291	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.62	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1053
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		291	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.17
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29321	PF Power Coefficient (p)		0.75821

In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1053	-	-	67.7
Vehicle Results					
Average Speed, mi/h		67.7	Percent Followers, %		39.8
Segment Travel Time, minutes		0.18	Follower Density (FD), followers/mi/ln		1.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		291	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.62	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 14					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1120
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		291	Opposing Demand Flow Rate, veh/h		207
Peak Hour Factor		0.88	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.17
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.32132	Speed Power Coefficient (p)		0.53735
PF Slope Coefficient (m)		-1.23984	PF Power Coefficient (p)		0.80643
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1120	-	-	68.2
Vehicle Results					
Average Speed, mi/h	68.2	Percent Followers, %	36.7		
Segment Travel Time, minutes	0.19	Follower Density (FD), followers/mi/ln	1.6		
Vehicle LOS	A				
Bicycle Results					
Percent Occupied Parking	0	Pavement Condition Rating	4		

Flow Rate Outside Lane, veh/h	291	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.62	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 15

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1272
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	347	Opposing Demand Flow Rate, veh/h	233
Peak Hour Factor	0.88	Total Trucks, %	5.09
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.20

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.33046	Speed Power Coefficient (p)	0.53049
PF Slope Coefficient (m)	-1.24528	PF Power Coefficient (p)	0.80456
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.1
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1272	-	-	67.9

Vehicle Results

Average Speed, mi/h	67.9	Percent Followers, %	41.2
Segment Travel Time, minutes	0.21	Follower Density (FD), followers/mi/ln	2.1
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	347	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.65	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 16

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	625
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	347	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	5.09
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.20

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29323	PF Power Coefficient (p)	0.75819
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	625	-	-	67.4

Vehicle Results			
Average Speed, mi/h	67.4	Percent Followers, %	44.0
Segment Travel Time, minutes	0.11	Follower Density (FD), followers/mi/ln	2.3
Vehicle LOS	B		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	347	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.65	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 17

Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	1995
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	347	Opposing Demand Flow Rate, veh/h	233
Peak Hour Factor	0.88	Total Trucks, %	5.09
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.20

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.34227	Speed Power Coefficient (p)	0.53049
PF Slope Coefficient (m)	-1.21527	PF Power Coefficient (p)	0.81755
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1995	-	-	67.9

Vehicle Results			
Average Speed, mi/h	67.9	Percent Followers, %	40.0

Segment Travel Time, minutes		0.33	Follower Density (FD), followers/mi/ln		2.0
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		347	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.65	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 18					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1399
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		347	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		5.09
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.20
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57524	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.28884	PF Power Coefficient (p)		0.75993
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1399	-	-	67.4
Vehicle Results					
Average Speed, mi/h		67.4	Percent Followers, %		43.8
Segment Travel Time, minutes		0.24	Follower Density (FD), followers/mi/ln		2.3
Vehicle LOS		B			

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	347	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.65	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		
Segment 19			
Vehicle Inputs			
Segment Type	Passing Constrained	Length, ft	1254
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		625	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		1.51
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.37
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29366	PF Power Coefficient (p)		0.75766
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		5.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1254	-	-	66.5
Vehicle Results					
Average Speed, mi/h		66.5	Percent Followers, %		59.6
Segment Travel Time, minutes		0.21	Follower Density (FD), followers/mi/ln		5.6
Vehicle LOS		C			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		625	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.94	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 20					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1108
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		625	Opposing Demand Flow Rate, veh/h		216
Peak Hour Factor		0.88	Total Trucks, %		1.51
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.37
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.32457	Speed Power Coefficient (p)		0.53490
PF Slope Coefficient (m)		-1.24221	PF Power Coefficient (p)		0.80521
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		5.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1108	-	-	66.9

Vehicle Results

Average Speed, mi/h	66.9	Percent Followers, %	57.3
Segment Travel Time, minutes	0.19	Follower Density (FD), followers/mi/ln	5.3
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	625	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.94	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 21

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	2901
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	625	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	1.51
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.37

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.59854	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.23554	PF Power Coefficient (p)	0.77974
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	5.4
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2901	-	-	66.5

Vehicle Results

Average Speed, mi/h	66.5	Percent Followers, %	57.5
Segment Travel Time, minutes	0.50	Follower Density (FD), followers/mi/ln	5.4
Vehicle LOS	C		

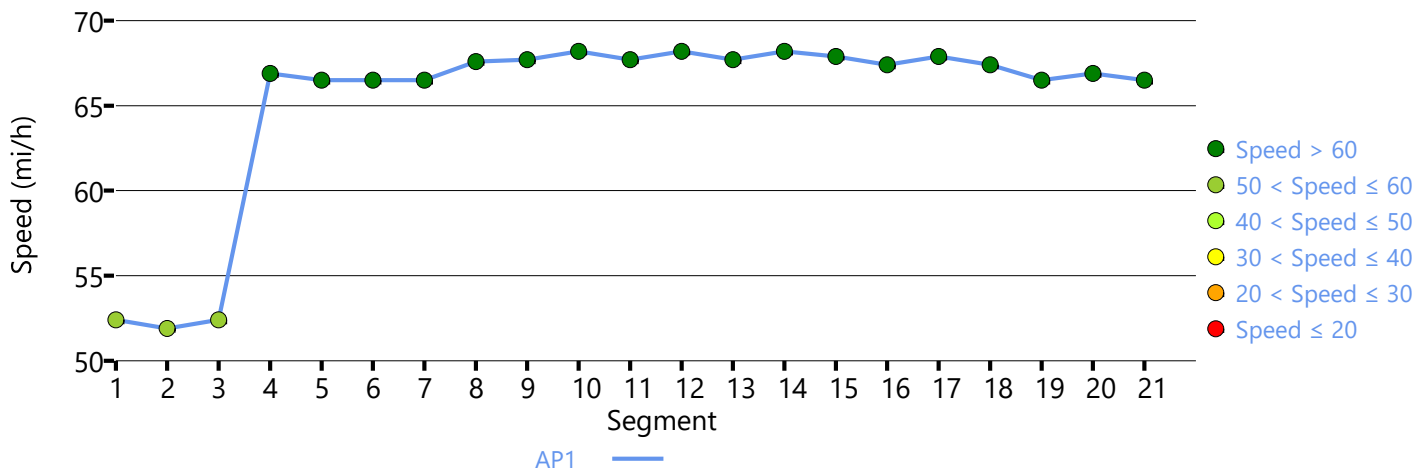
Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	625	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.94	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

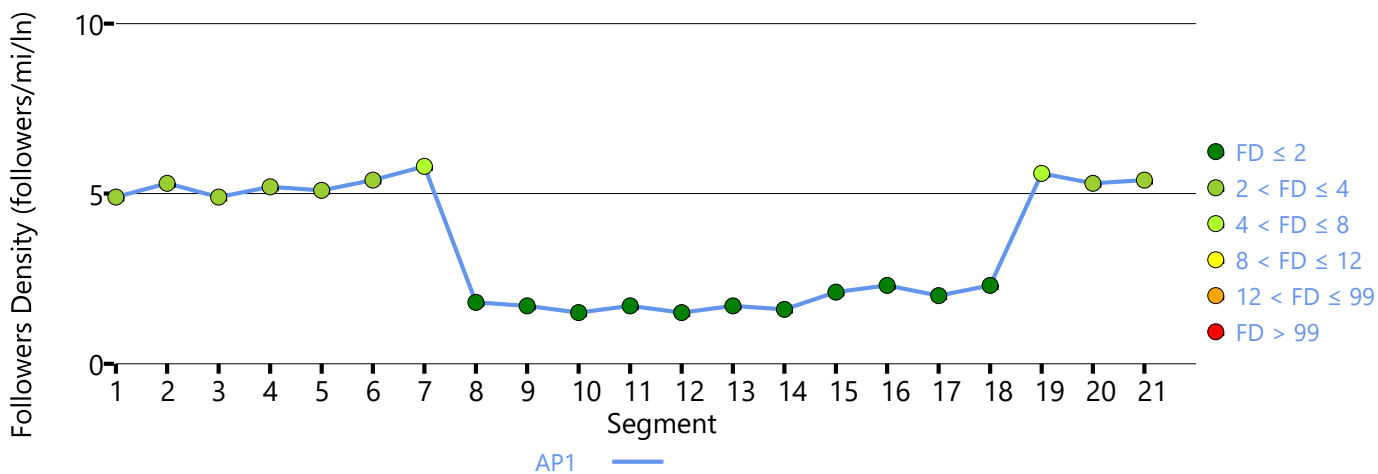
Facility Results

T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	625	0.41	3.5	B

Speed Distribution



Followers Density Distribution



HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	5/11/2023
Agency	HRG	Analysis Year	2040 NB
Jurisdiction	SDDOT	Time Analyzed	PM PEAK
Project Description	EB SD38 Corridor Study	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1084
Measured FFS	Measured	Free-Flow Speed, mi/h	55.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	299	Opposing Demand Flow Rate, veh/h	551
Peak Hour Factor	0.88	Total Trucks, %	2.16
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.18

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.0
Speed Slope Coefficient (m)	4.41560	Speed Power Coefficient (p)	0.47557
PF Slope Coefficient (m)	-1.38878	PF Power Coefficient (p)	0.75207
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.4
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1084	-	-	53.0

Vehicle Results

Average Speed, mi/h	53.0	Percent Followers, %	42.9
Segment Travel Time, minutes	0.23	Follower Density (FD), followers/mi/ln	2.4
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	299	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.60	Bicycle Effective Speed Factor	4.62
Bicycle LOS	C		

Segment 2

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1014
Measured FFS	Measured	Free-Flow Speed, mi/h	55.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		299	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.16
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.18
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		55.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.43973	PF Power Coefficient (p)		0.72475
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	507	-	-	52.7
2	Horizontal Curve	507	3000	0.0	52.7
Vehicle Results					
Average Speed, mi/h		52.7	Percent Followers, %		45.1
Segment Travel Time, minutes		0.22	Follower Density (FD), followers/mi/ln		2.6
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		299	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.60	Bicycle Effective Speed Factor		4.62
Bicycle LOS		C			
Segment 3					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		535
Measured FFS		Measured	Free-Flow Speed, mi/h		55.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		299	Opposing Demand Flow Rate, veh/h		551
Peak Hour Factor		0.88	Total Trucks, %		2.16
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.18
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		55.0
Speed Slope Coefficient (m)		4.41560	Speed Power Coefficient (p)		0.47557
PF Slope Coefficient (m)		-1.38878	PF Power Coefficient (p)		0.75207
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	535	-	-	53.0

Vehicle Results			
Average Speed, mi/h	53.0	Percent Followers, %	42.9
Segment Travel Time, minutes	0.11	Follower Density (FD), followers/mi/ln	2.4
Vehicle LOS	B		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	299	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.60	Bicycle Effective Speed Factor	4.62
Bicycle LOS	C		

Segment 4			
Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	1494
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	333	Opposing Demand Flow Rate, veh/h	735
Peak Hour Factor	0.88	Total Trucks, %	1.63
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.20

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.45661	Speed Power Coefficient (p)	0.45644
PF Slope Coefficient (m)	-1.28454	PF Power Coefficient (p)	0.78414
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.1
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1494	-	-	67.7

Vehicle Results			
Average Speed, mi/h	67.7	Percent Followers, %	41.9
Segment Travel Time, minutes	0.25	Follower Density (FD), followers/mi/ln	2.1
Vehicle LOS	B		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	333	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.65	Bicycle Effective Speed Factor	5.07

Bicycle LOS		C			
Segment 5					
Vehicle Inputs					
Segment Type		Passing Constrained		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				5762	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		333		Opposing Demand Flow Rate, veh/h	
				-	
Peak Hour Factor		0.88		Total Trucks, %	
				1.63	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.20	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
				70.0	
Speed Slope Coefficient (m)		4.62977		Speed Power Coefficient (p)	
				0.41674	
PF Slope Coefficient (m)		-1.20069		PF Power Coefficient (p)	
				0.78591	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln	
				2.0	
%Improvement to Percent Followers		0.0		%Improvement to Speed	
				0.0	
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5762	-	-	67.5
Vehicle Results					
Average Speed, mi/h		67.5		Percent Followers, %	
				39.7	
Segment Travel Time, minutes		0.97		Follower Density (FD), followers/mi/ln	
				2.0	
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0		Pavement Condition Rating	
				4	
Flow Rate Outside Lane, veh/h		333		Bicycle Effective Width, ft	
				24	
Bicycle LOS Score		2.65		Bicycle Effective Speed Factor	
				5.07	
Bicycle LOS		C			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained		Length, ft	
				383	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		340		Opposing Demand Flow Rate, veh/h	
				-	
Peak Hour Factor		0.88		Total Trucks, %	
				1.89	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.20	
Intermediate Results					

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29361	PF Power Coefficient (p)	0.75772
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	383	-	-	67.5

Vehicle Results			
Average Speed, mi/h	67.5	Percent Followers, %	43.5
Segment Travel Time, minutes	0.06	Follower Density (FD), followers/mi/ln	2.2
Vehicle LOS	B		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	340	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.73	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 7

Vehicle Inputs			
Segment Type	Passing Constrained	Length, ft	1485
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	380	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	3.19
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.22

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57684	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.28453	PF Power Coefficient (p)	0.76145
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.6
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1485	-	-	67.3

Vehicle Results			
Average Speed, mi/h	67.3	Percent Followers, %	45.9
Segment Travel Time, minutes	0.25	Follower Density (FD), followers/mi/ln	2.6

Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking	0	Pavement Condition Rating	4		
Flow Rate Outside Lane, veh/h	380	Bicycle Effective Width, ft	24		
Bicycle LOS Score	3.13	Bicycle Effective Speed Factor	5.07		
Bicycle LOS	C				
Segment 8					
Vehicle Inputs					
Segment Type	Passing Constrained	Length, ft	426		
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0		
Demand and Capacity					
Directional Demand Flow Rate, veh/h	289	Opposing Demand Flow Rate, veh/h	-		
Peak Hour Factor	0.88	Total Trucks, %	6.47		
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.17		
Intermediate Results					
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0		
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674		
PF Slope Coefficient (m)	-1.29307	PF Power Coefficient (p)	0.75839		
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.7		
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0		
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	426	-	-	67.7
Vehicle Results					
Average Speed, mi/h	67.7	Percent Followers, %	39.6		
Segment Travel Time, minutes	0.07	Follower Density (FD), followers/mi/ln	1.7		
Vehicle LOS	A				
Bicycle Results					
Percent Occupied Parking	0	Pavement Condition Rating	4		
Flow Rate Outside Lane, veh/h	289	Bicycle Effective Width, ft	24		
Bicycle LOS Score	4.03	Bicycle Effective Speed Factor	5.07		
Bicycle LOS	D				
Segment 9					
Vehicle Inputs					
Segment Type	Passing Constrained	Length, ft	1212		
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0		

Demand and Capacity					
Directional Demand Flow Rate, veh/h		251	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29321	PF Power Coefficient (p)		0.75821
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1212	-	-	67.9
Vehicle Results					
Average Speed, mi/h		67.9	Percent Followers, %		36.5
Segment Travel Time, minutes		0.20	Follower Density (FD), followers/mi/ln		1.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		251	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.55	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1877
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		251	Opposing Demand Flow Rate, veh/h		344
Peak Hour Factor		0.88	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.37450	Speed Power Coefficient (p)		0.50652
PF Slope Coefficient (m)		-1.23731	PF Power Coefficient (p)		0.80872
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1877	-	-	68.3

Vehicle Results

Average Speed, mi/h	68.3	Percent Followers, %	33.3
Segment Travel Time, minutes	0.31	Follower Density (FD), followers/mi/ln	1.2
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	251	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.55	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 11

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1872
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	251	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	5.26
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.15

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.58354	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.26676	PF Power Coefficient (p)	0.76864
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1872	-	-	67.9

Vehicle Results

Average Speed, mi/h	67.9	Percent Followers, %	35.5
Segment Travel Time, minutes	0.31	Follower Density (FD), followers/mi/ln	1.3
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	251	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.55	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 12					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		3603
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		251	Opposing Demand Flow Rate, veh/h		344
Peak Hour Factor		0.88	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.39815	Speed Power Coefficient (p)		0.50652
PF Slope Coefficient (m)		-1.19302	PF Power Coefficient (p)		0.82521
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3603	-	-	68.3
Vehicle Results					
Average Speed, mi/h		68.3	Percent Followers, %		31.7
Segment Travel Time, minutes		0.60	Follower Density (FD), followers/mi/ln		1.2
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		251	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.55	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1053
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		251	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29321	PF Power Coefficient (p)	0.75821
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1053	-	-	67.9

Vehicle Results			
Average Speed, mi/h	67.9	Percent Followers, %	36.5
Segment Travel Time, minutes	0.18	Follower Density (FD), followers/mi/ln	1.3
Vehicle LOS	A		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	251	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.55	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 14

Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	1120
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	251	Opposing Demand Flow Rate, veh/h	344
Peak Hour Factor	0.88	Total Trucks, %	5.26
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.15

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.36460	Speed Power Coefficient (p)	0.50652
PF Slope Coefficient (m)	-1.26336	PF Power Coefficient (p)	0.79785
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1120	-	-	68.3

Vehicle Results			
Average Speed, mi/h	68.3	Percent Followers, %	34.3
Segment Travel Time, minutes	0.19	Follower Density (FD), followers/mi/ln	1.3
Vehicle LOS	A		

Bicycle Results											
Percent Occupied Parking		0		Pavement Condition Rating		4					
Flow Rate Outside Lane, veh/h		251		Bicycle Effective Width, ft		24					
Bicycle LOS Score		3.55		Bicycle Effective Speed Factor		5.07					
Bicycle LOS		D									
Segment 15											
Vehicle Inputs											
Segment Type		Passing Zone		Length, ft		1272					
Measured FFS		Measured		Free-Flow Speed, mi/h		70.0					
Demand and Capacity											
Directional Demand Flow Rate, veh/h		316		Opposing Demand Flow Rate, veh/h		411					
Peak Hour Factor		0.88		Total Trucks, %		5.09					
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.19					
Intermediate Results											
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0					
Speed Slope Coefficient (m)		4.38249		Speed Power Coefficient (p)		0.49499					
PF Slope Coefficient (m)		-1.27147		PF Power Coefficient (p)		0.79437					
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		1.9					
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0					
Subsegment Data											
#	Segment Type		Length, ft		Radius, ft		Superelevation, %		Average Speed, mi/h		
1	Tangent		1272		-		-		67.9		
Vehicle Results											
Average Speed, mi/h			67.9			Percent Followers, %			39.9		
Segment Travel Time, minutes			0.21			Follower Density (FD), followers/mi/ln			1.9		
Vehicle LOS			A								
Bicycle Results											
Percent Occupied Parking			0			Pavement Condition Rating			4		
Flow Rate Outside Lane, veh/h			316			Bicycle Effective Width, ft			24		
Bicycle LOS Score			3.61			Bicycle Effective Speed Factor			5.07		
Bicycle LOS			D								
Segment 16											
Vehicle Inputs											
Segment Type			Passing Constrained			Length, ft			625		
Measured FFS			Measured			Free-Flow Speed, mi/h			70.0		
Demand and Capacity											

Directional Demand Flow Rate, veh/h		316	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		5.09
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.19
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29323	PF Power Coefficient (p)		0.75819
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.9
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	625	-	-	67.6
Vehicle Results					
Average Speed, mi/h		67.6	Percent Followers, %		41.7
Segment Travel Time, minutes		0.11	Follower Density (FD), followers/mi/ln		1.9
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		316	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.61	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 17					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1995
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		316	Opposing Demand Flow Rate, veh/h		411
Peak Hour Factor		0.88	Total Trucks, %		5.09
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.19
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.39429	Speed Power Coefficient (p)		0.49499
PF Slope Coefficient (m)		-1.24073	PF Power Coefficient (p)		0.80695
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.8
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	1995	-	-	67.9
Vehicle Results					
Average Speed, mi/h		67.9	Percent Followers, %		38.7
Segment Travel Time, minutes		0.33	Follower Density (FD), followers/mi/ln		1.8
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		316	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.61	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 18					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1399
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		316	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		5.09
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.19
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57524	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.28884	PF Power Coefficient (p)		0.75993
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.9
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1399	-	-	67.6
Vehicle Results					
Average Speed, mi/h		67.6	Percent Followers, %		41.5
Segment Travel Time, minutes		0.24	Follower Density (FD), followers/mi/ln		1.9
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		316	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.61	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 19					

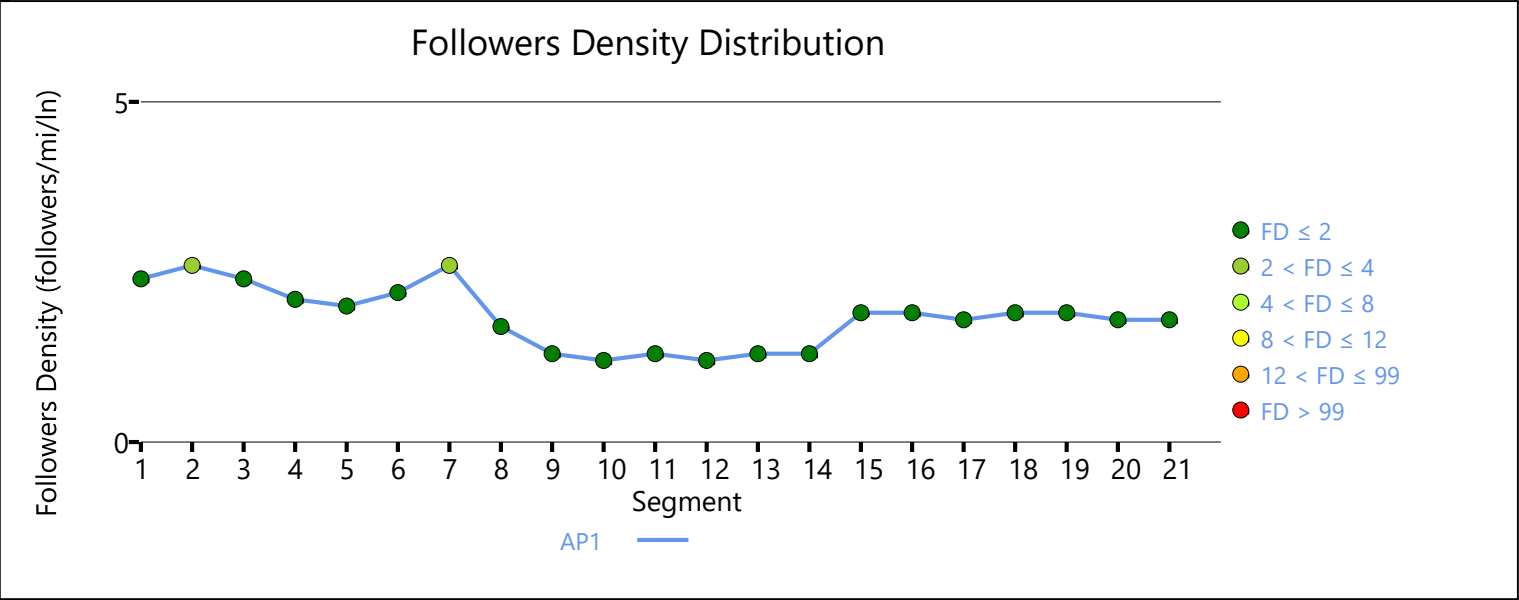
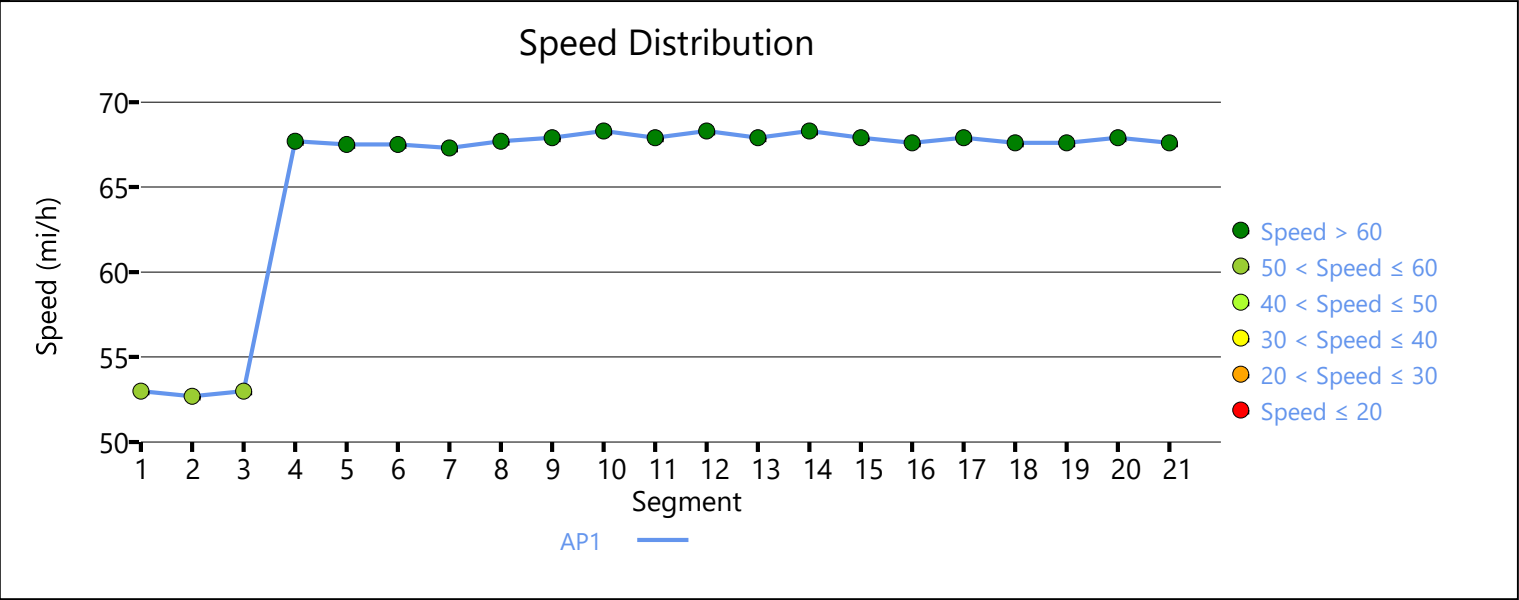
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1254
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		309	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		1.51
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.18
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29366	PF Power Coefficient (p)		0.75766
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.9
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1254	-	-	67.6
Vehicle Results					
Average Speed, mi/h		67.6	Percent Followers, %		41.2
Segment Travel Time, minutes		0.21	Follower Density (FD), followers/mi/ln		1.9
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		309	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.58	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 20					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1108
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		309	Opposing Demand Flow Rate, veh/h		659
Peak Hour Factor		0.88	Total Trucks, %		1.51
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.18
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.43837	Speed Power Coefficient (p)		0.46364
PF Slope Coefficient (m)		-1.29067	PF Power Coefficient (p)		0.78323

In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.8
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1108	-	-	67.9
Vehicle Results					
Average Speed, mi/h		67.9	Percent Followers, %		40.2
Segment Travel Time, minutes		0.19	Follower Density (FD), followers/mi/ln		1.8
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		309	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.58	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 21					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		2901
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		309	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		1.51
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.18
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.59854	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.23554	PF Power Coefficient (p)		0.77974
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.8
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2901	-	-	67.6
Vehicle Results					
Average Speed, mi/h	67.6	Percent Followers, %	39.0		
Segment Travel Time, minutes	0.49	Follower Density (FD), followers/mi/ln	1.8		
Vehicle LOS	A				
Bicycle Results					
Percent Occupied Parking	0	Pavement Condition Rating	4		

Flow Rate Outside Lane, veh/h	309	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.58	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Facility Results				
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	417	0.20	1.8	A



HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	5/11/2023
Agency	HRG	Analysis Year	2040 NB
Jurisdiction	SDDOT	Time Analyzed	AM Peak
Project Description	SD 38 WB East of Hartford	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1727
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	216	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	8.97
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.13

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.58112	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.27241	PF Power Coefficient (p)	0.76681
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1727	-	-	68.1

Vehicle Results

Average Speed, mi/h	68.1	Percent Followers, %	32.5
Segment Travel Time, minutes	0.29	Follower Density (FD), followers/mi/ln	1.0
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	216	Bicycle Effective Width, ft	24
Bicycle LOS Score	4.83	Bicycle Effective Speed Factor	5.07
Bicycle LOS	E		

Segment 2

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1676
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		216	Opposing Demand Flow Rate, veh/h		625
Peak Hour Factor		0.88	Total Trucks, %		8.97
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.13
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.43792	Speed Power Coefficient (p)		0.46717
PF Slope Coefficient (m)		-1.26992	PF Power Coefficient (p)		0.79284
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.0
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1676	-	-	68.4
Vehicle Results					
Average Speed, mi/h		68.4	Percent Followers, %		31.4
Segment Travel Time, minutes		0.28	Follower Density (FD), followers/mi/ln		1.0
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		216	Bicycle Effective Width, ft		24
Bicycle LOS Score		4.83	Bicycle Effective Speed Factor		5.07
Bicycle LOS		E			
Segment 3					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1864
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		233	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		17.04
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.14
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.58341	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.26572	PF Power Coefficient (p)		0.77025
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1864	-	-	68.0

Vehicle Results

Average Speed, mi/h	68.0	Percent Followers, %	33.8
Segment Travel Time, minutes	0.31	Follower Density (FD), followers/mi/ln	1.2
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	233	Bicycle Effective Width, ft	24
Bicycle LOS Score	8.85	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 4

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	718
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	233	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	17.04
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.14

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29182	PF Power Coefficient (p)	0.75993
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	718	-	-	68.0

Vehicle Results

Average Speed, mi/h	68.0	Percent Followers, %	34.8
Segment Travel Time, minutes	0.12	Follower Density (FD), followers/mi/ln	1.2
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	233	Bicycle Effective Width, ft	24
Bicycle LOS Score	8.85	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1738
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		233	Opposing Demand Flow Rate, veh/h		347
Peak Hour Factor		0.88	Total Trucks, %		17.04
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.14
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.37282	Speed Power Coefficient (p)		0.50610
PF Slope Coefficient (m)		-1.24196	PF Power Coefficient (p)		0.80802
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1738	-	-	68.4
Vehicle Results					
Average Speed, mi/h		68.4	Percent Followers, %		31.8
Segment Travel Time, minutes		0.29	Follower Density (FD), followers/mi/ln		1.1
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		233	Bicycle Effective Width, ft		24
Bicycle LOS Score		8.85	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		579
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		233	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		17.04
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.14
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29182	PF Power Coefficient (p)	0.75993
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	579	-	-	68.0

Vehicle Results			
Average Speed, mi/h	68.0	Percent Followers, %	34.8
Segment Travel Time, minutes	0.10	Follower Density (FD), followers/mi/ln	1.2
Vehicle LOS	A		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	233	Bicycle Effective Width, ft	24
Bicycle LOS Score	8.85	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 7

Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	2262
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	207	Opposing Demand Flow Rate, veh/h	291
Peak Hour Factor	0.88	Total Trucks, %	18.44
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.12

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.36495	Speed Power Coefficient (p)	0.51711
PF Slope Coefficient (m)	-1.21478	PF Power Coefficient (p)	0.81940
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.9
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2262	-	-	68.6

Vehicle Results			
Average Speed, mi/h	68.6	Percent Followers, %	28.4
Segment Travel Time, minutes	0.37	Follower Density (FD), followers/mi/ln	0.9
Vehicle LOS	A		

Bicycle Results											
Percent Occupied Parking		0		Pavement Condition Rating		4					
Flow Rate Outside Lane, veh/h		207		Bicycle Effective Width, ft		24					
Bicycle LOS Score		9.63		Bicycle Effective Speed Factor		5.07					
Bicycle LOS		F									
Segment 8											
Vehicle Inputs											
Segment Type		Passing Constrained		Length, ft		980					
Measured FFS		Measured		Free-Flow Speed, mi/h		70.0					
Demand and Capacity											
Directional Demand Flow Rate, veh/h		207		Opposing Demand Flow Rate, veh/h		-					
Peak Hour Factor		0.88		Total Trucks, %		18.44					
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.12					
Intermediate Results											
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0					
Speed Slope Coefficient (m)		4.57372		Speed Power Coefficient (p)		0.41674					
PF Slope Coefficient (m)		-1.29166		PF Power Coefficient (p)		0.76014					
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		1.0					
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0					
Subsegment Data											
#	Segment Type		Length, ft		Radius, ft		Superelevation, %		Average Speed, mi/h		
1	Tangent		980		-		-		68.2		
Vehicle Results											
Average Speed, mi/h			68.2			Percent Followers, %			32.3		
Segment Travel Time, minutes			0.16			Follower Density (FD), followers/mi/ln			1.0		
Vehicle LOS			A								
Bicycle Results											
Percent Occupied Parking			0			Pavement Condition Rating			4		
Flow Rate Outside Lane, veh/h			207			Bicycle Effective Width, ft			24		
Bicycle LOS Score			9.63			Bicycle Effective Speed Factor			5.07		
Bicycle LOS			F								
Segment 9											
Vehicle Inputs											
Segment Type			Passing Zone			Length, ft			3667		
Measured FFS			Measured			Free-Flow Speed, mi/h			70.0		
Demand and Capacity											

Directional Demand Flow Rate, veh/h		207	Opposing Demand Flow Rate, veh/h		291
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.12
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.38336	Speed Power Coefficient (p)		0.51711
PF Slope Coefficient (m)		-1.18328	PF Power Coefficient (p)		0.83086
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.8
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3667	-	-	68.6
Vehicle Results					
Average Speed, mi/h		68.6	Percent Followers, %		27.3
Segment Travel Time, minutes		0.61	Follower Density (FD), followers/mi/ln		0.8
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		207	Bicycle Effective Width, ft		24
Bicycle LOS Score		9.63	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1846
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		207	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.12
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.58311	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.26629	PF Power Coefficient (p)		0.77017
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.0
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	1846	-	-	68.2
Vehicle Results					
Average Speed, mi/h		68.2	Percent Followers, %		31.4
Segment Travel Time, minutes		0.31	Follower Density (FD), followers/mi/ln		1.0
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		207	Bicycle Effective Width, ft		24
Bicycle LOS Score		9.63	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		2174
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		207	Opposing Demand Flow Rate, veh/h		291
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.12
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.36363	Speed Power Coefficient (p)		0.51711
PF Slope Coefficient (m)		-1.21761	PF Power Coefficient (p)		0.81825
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.9
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2174	-	-	68.6
Vehicle Results					
Average Speed, mi/h		68.6	Percent Followers, %		28.5
Segment Travel Time, minutes		0.36	Follower Density (FD), followers/mi/ln		0.9
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		207	Bicycle Effective Width, ft		24
Bicycle LOS Score		9.63	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 12					

Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1277
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		207	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.12
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29166	PF Power Coefficient (p)		0.76014
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.0
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1277	-	-	68.2
Vehicle Results					
Average Speed, mi/h		68.2	Percent Followers, %		32.3
Segment Travel Time, minutes		0.21	Follower Density (FD), followers/mi/ln		1.0
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		207	Bicycle Effective Width, ft		24
Bicycle LOS Score		9.63	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		779
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		207	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.12
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29166	PF Power Coefficient (p)		0.76014

In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.0
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	779	-	-	68.2
Vehicle Results					
Average Speed, mi/h		68.2	Percent Followers, %		32.3
Segment Travel Time, minutes		0.13	Follower Density (FD), followers/mi/ln		1.0
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		207	Bicycle Effective Width, ft		24
Bicycle LOS Score		9.63	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 14					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		422
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		255	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		13.95
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29219	PF Power Coefficient (p)		0.75948
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	422	-	-	67.9
Vehicle Results					
Average Speed, mi/h		67.9	Percent Followers, %		36.7
Segment Travel Time, minutes		0.07	Follower Density (FD), followers/mi/ln		1.4
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4

Flow Rate Outside Lane, veh/h	255	Bicycle Effective Width, ft	24
Bicycle LOS Score	7.20	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 15

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1478
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	224	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	19.53
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.13

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57671	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.28298	PF Power Coefficient (p)	0.76370
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.1
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1478	-	-	68.1

Vehicle Results

Average Speed, mi/h	68.1	Percent Followers, %	33.6
Segment Travel Time, minutes	0.25	Follower Density (FD), followers/mi/ln	1.1
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	224	Bicycle Effective Width, ft	24
Bicycle LOS Score	10.35	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 16

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	384
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	333	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	12.76
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.20

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29233	PF Power Coefficient (p)	0.75931
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.1
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	384	-	-	67.5

Vehicle Results			
Average Speed, mi/h	67.5	Percent Followers, %	42.9
Segment Travel Time, minutes	0.06	Follower Density (FD), followers/mi/ln	2.1
Vehicle LOS	B		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	333	Bicycle Effective Width, ft	24
Bicycle LOS Score	6.74	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 17

Vehicle Inputs			
Segment Type	Passing Constrained	Length, ft	3732
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	323	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	12.21
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.19

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.60878	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.21846	PF Power Coefficient (p)	0.78615
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.9
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3732	-	-	67.5

Vehicle Results			
Average Speed, mi/h	67.5	Percent Followers, %	39.4

Segment Travel Time, minutes		0.63	Follower Density (FD), followers/mi/ln		1.9
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		323	Bicycle Effective Width, ft		24
Bicycle LOS Score		6.46	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 18					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1360
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		323	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		12.21
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.19
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57450	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29014	PF Power Coefficient (p)		0.76012
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.0
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1360	-	-	67.6
Vehicle Results					
Average Speed, mi/h		67.6	Percent Followers, %		42.1
Segment Travel Time, minutes		0.23	Follower Density (FD), followers/mi/ln		2.0
Vehicle LOS		B			

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	323	Bicycle Effective Width, ft	24
Bicycle LOS Score	6.46	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		
Segment 19			
Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	1595
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		323	Opposing Demand Flow Rate, veh/h		609
Peak Hour Factor		0.88	Total Trucks, %		12.21
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.19
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.43319	Speed Power Coefficient (p)		0.46889
PF Slope Coefficient (m)		-1.27240	PF Power Coefficient (p)		0.79247
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.9
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1595	-	-	67.8
Vehicle Results					
Average Speed, mi/h		67.8	Percent Followers, %		40.5
Segment Travel Time, minutes		0.27	Follower Density (FD), followers/mi/ln		1.9
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		323	Bicycle Effective Width, ft		24
Bicycle LOS Score		6.46	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 20					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		595
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		323	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		12.21
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.19
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29239	PF Power Coefficient (p)		0.75923
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.0
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	595	-	-	67.6

Vehicle Results

Average Speed, mi/h	67.6	Percent Followers, %	42.2
Segment Travel Time, minutes	0.10	Follower Density (FD), followers/mi/ln	2.0
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	323	Bicycle Effective Width, ft	24
Bicycle LOS Score	6.46	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 21

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	958
Measured FFS	Measured	Free-Flow Speed, mi/h	55.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	289	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	10.81
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.17

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.43859	PF Power Coefficient (p)	0.72596
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.4
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	958	-	-	52.7

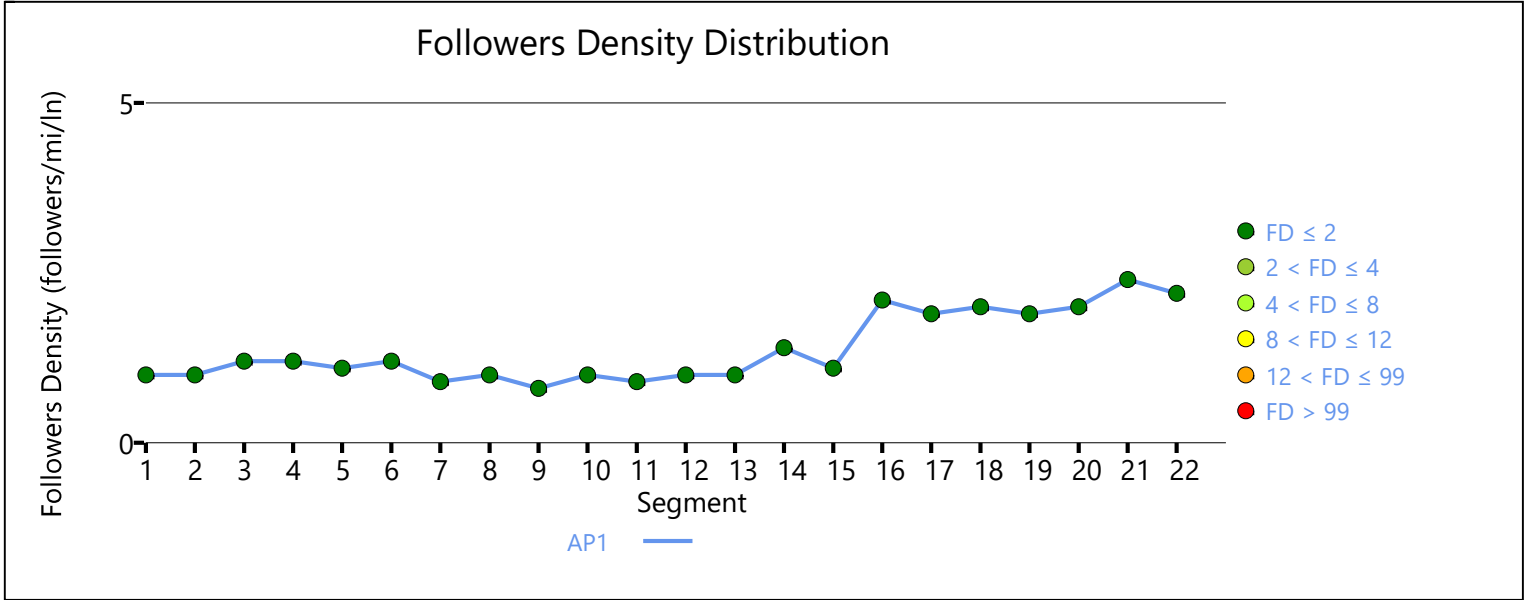
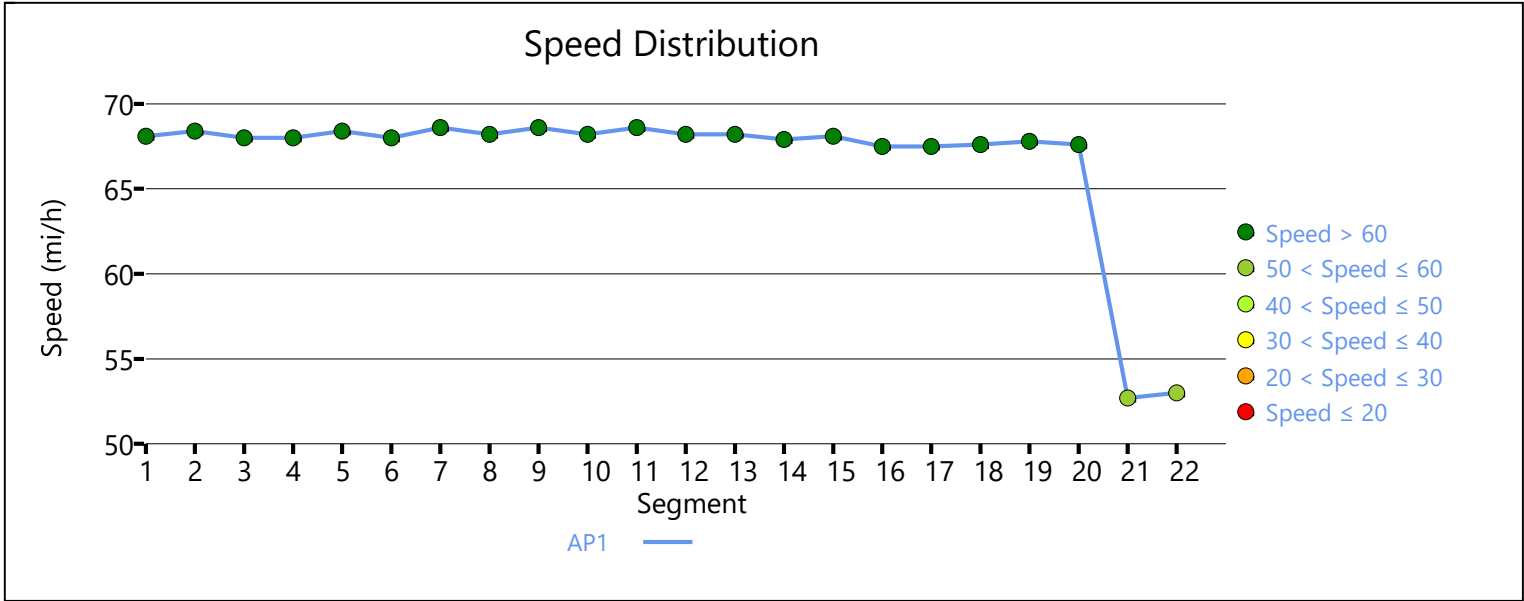
Vehicle Results

Average Speed, mi/h	52.7	Percent Followers, %	44.2
Segment Travel Time, minutes	0.21	Follower Density (FD), followers/mi/ln	2.4
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	289	Bicycle Effective Width, ft	24
Bicycle LOS Score	5.35	Bicycle Effective Speed Factor	4.62
Bicycle LOS	E		

Segment 22					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1659
Measured FFS		Measured	Free-Flow Speed, mi/h		55.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		289	Opposing Demand Flow Rate, veh/h		480
Peak Hour Factor		0.88	Total Trucks, %		10.81
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.17
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		55.0
Speed Slope Coefficient (m)		4.40548	Speed Power Coefficient (p)		0.48486
PF Slope Coefficient (m)		-1.35962	PF Power Coefficient (p)		0.76214
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1659	-	-	53.0
Vehicle Results					
Average Speed, mi/h		53.0	Percent Followers, %		41.0
Segment Travel Time, minutes		0.36	Follower Density (FD), followers/mi/ln		2.2
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		289	Bicycle Effective Width, ft		24
Bicycle LOS Score		5.35	Bicycle Effective Speed Factor		4.62
Bicycle LOS		E			
Facility Results					
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS	
1	343	0.15	1.3	A	



HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	5/11/2023
Agency	HRG	Analysis Year	2040 NB
Jurisdiction	SDDOT	Time Analyzed	PM Peak
Project Description	SD 38 WB East of Hartford	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1727
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	659	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	8.97
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.39

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.58112	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.27241	PF Power Coefficient (p)	0.76681
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	6.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1727	-	-	66.4

Vehicle Results

Average Speed, mi/h	66.4	Percent Followers, %	60.3
Segment Travel Time, minutes	0.30	Follower Density (FD), followers/mi/ln	6.0
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	659	Bicycle Effective Width, ft	24
Bicycle LOS Score	5.39	Bicycle Effective Speed Factor	5.07
Bicycle LOS	E		

Segment 2

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1676
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity							
Directional Demand Flow Rate, veh/h		659		Opposing Demand Flow Rate, veh/h		309	
Peak Hour Factor		0.88		Total Trucks, %		8.97	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.39	
Intermediate Results							
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0	
Speed Slope Coefficient (m)		4.36102		Speed Power Coefficient (p)		0.51334	
PF Slope Coefficient (m)		-1.24034		PF Power Coefficient (p)		0.80784	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		5.8	
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0	
Subsegment Data							
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h		
1	Tangent	1676	-	-	66.8		
Vehicle Results							
Average Speed, mi/h		66.8		Percent Followers, %		58.8	
Segment Travel Time, minutes		0.29		Follower Density (FD), followers/mi/ln		5.8	
Vehicle LOS		C					
Bicycle Results							
Percent Occupied Parking		0		Pavement Condition Rating		4	
Flow Rate Outside Lane, veh/h		659		Bicycle Effective Width, ft		24	
Bicycle LOS Score		5.39		Bicycle Effective Speed Factor		5.07	
Bicycle LOS		E					
Segment 3							
Vehicle Inputs							
Segment Type		Passing Constrained		Length, ft		1864	
Measured FFS		Measured		Free-Flow Speed, mi/h		70.0	
Demand and Capacity							
Directional Demand Flow Rate, veh/h		411		Opposing Demand Flow Rate, veh/h		-	
Peak Hour Factor		0.88		Total Trucks, %		17.04	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.24	
Intermediate Results							
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0	
Speed Slope Coefficient (m)		4.58341		Speed Power Coefficient (p)		0.41674	
PF Slope Coefficient (m)		-1.26572		PF Power Coefficient (p)		0.77025	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		2.9	
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0	
Subsegment Data							

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1864	-	-	67.2

Vehicle Results

Average Speed, mi/h	67.2	Percent Followers, %	47.2
Segment Travel Time, minutes	0.32	Follower Density (FD), followers/mi/ln	2.9
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	411	Bicycle Effective Width, ft	24
Bicycle LOS Score	9.14	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 4

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	718
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	411	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	17.04
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.24

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29182	PF Power Coefficient (p)	0.75993
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	718	-	-	67.2

Vehicle Results

Average Speed, mi/h	67.2	Percent Followers, %	48.2
Segment Travel Time, minutes	0.12	Follower Density (FD), followers/mi/ln	3.0
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	411	Bicycle Effective Width, ft	24
Bicycle LOS Score	9.14	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Zone		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
1738		70.0			
Demand and Capacity					
Directional Demand Flow Rate, veh/h		411		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.88		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.24	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
Speed Slope Coefficient (m)		4.36408		Speed Power Coefficient (p)	
PF Slope Coefficient (m)		-1.23776		PF Power Coefficient (p)	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln	
%Improvement to Percent Followers		0.0		%Improvement to Speed	
				0.0	
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1738	-	-	67.6
Vehicle Results					
Average Speed, mi/h		67.6		Percent Followers, %	
Segment Travel Time, minutes		0.29		Follower Density (FD), followers/mi/ln	
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0		Pavement Condition Rating	
Flow Rate Outside Lane, veh/h		411		Bicycle Effective Width, ft	
Bicycle LOS Score		9.14		Bicycle Effective Speed Factor	
Bicycle LOS		F			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		411		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.88		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.24	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
				70.0	

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29182	PF Power Coefficient (p)	0.75993
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	579	-	-	67.2

Vehicle Results

Average Speed, mi/h	67.2	Percent Followers, %	48.2
Segment Travel Time, minutes	0.10	Follower Density (FD), followers/mi/ln	3.0
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	411	Bicycle Effective Width, ft	24
Bicycle LOS Score	9.14	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 7

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	2262
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	344	Opposing Demand Flow Rate, veh/h	251
Peak Hour Factor	0.88	Total Trucks, %	18.44
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.20

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.35242	Speed Power Coefficient (p)	0.52604
PF Slope Coefficient (m)	-1.20821	PF Power Coefficient (p)	0.82203
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2262	-	-	67.9

Vehicle Results

Average Speed, mi/h	67.9	Percent Followers, %	39.5
Segment Travel Time, minutes	0.38	Follower Density (FD), followers/mi/ln	2.0
Vehicle LOS	B		

Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		344	Bicycle Effective Width, ft		24
Bicycle LOS Score		9.89	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 8					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		980
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		344	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.20
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29166	PF Power Coefficient (p)		0.76014
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	980	-	-	67.5
Vehicle Results					
Average Speed, mi/h		67.5	Percent Followers, %		43.7
Segment Travel Time, minutes		0.17	Follower Density (FD), followers/mi/ln		2.2
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		344	Bicycle Effective Width, ft		24
Bicycle LOS Score		9.89	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 9					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		3667
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					

Directional Demand Flow Rate, veh/h		344	Opposing Demand Flow Rate, veh/h		251
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.20
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.37083	Speed Power Coefficient (p)		0.52604
PF Slope Coefficient (m)		-1.17691	PF Power Coefficient (p)		0.83360
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.9
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3667	-	-	67.9
Vehicle Results					
Average Speed, mi/h		67.9	Percent Followers, %		38.4
Segment Travel Time, minutes		0.61	Follower Density (FD), followers/mi/ln		1.9
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		344	Bicycle Effective Width, ft		24
Bicycle LOS Score		9.89	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1846
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		344	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.20
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.58311	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.26629	PF Power Coefficient (p)		0.77017
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	1846	-	-	67.5
Vehicle Results					
Average Speed, mi/h		67.5	Percent Followers, %		42.7
Segment Travel Time, minutes		0.31	Follower Density (FD), followers/mi/ln		2.2
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		344	Bicycle Effective Width, ft		24
Bicycle LOS Score		9.89	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		2174
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		344	Opposing Demand Flow Rate, veh/h		251
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.20
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.35110	Speed Power Coefficient (p)		0.52604
PF Slope Coefficient (m)		-1.21102	PF Power Coefficient (p)		0.82087
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.0
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2174	-	-	67.9
Vehicle Results					
Average Speed, mi/h		67.9	Percent Followers, %		39.6
Segment Travel Time, minutes		0.36	Follower Density (FD), followers/mi/ln		2.0
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		344	Bicycle Effective Width, ft		24
Bicycle LOS Score		9.89	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 12					

Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1277
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		344	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.20
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29166	PF Power Coefficient (p)		0.76014
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1277	-	-	67.5
Vehicle Results					
Average Speed, mi/h		67.5	Percent Followers, %		43.7
Segment Travel Time, minutes		0.22	Follower Density (FD), followers/mi/ln		2.2
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		344	Bicycle Effective Width, ft		24
Bicycle LOS Score		9.89	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		779
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		344	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.20
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29166	PF Power Coefficient (p)		0.76014

In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	779	-	-	67.5
Vehicle Results					
Average Speed, mi/h		67.5	Percent Followers, %		43.7
Segment Travel Time, minutes		0.13	Follower Density (FD), followers/mi/ln		2.2
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		344	Bicycle Effective Width, ft		24
Bicycle LOS Score		9.89	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 14					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		422
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		430	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		13.95
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.25
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29219	PF Power Coefficient (p)		0.75948
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		3.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	422	-	-	67.1
Vehicle Results					
Average Speed, mi/h	67.1	Percent Followers, %	49.3		
Segment Travel Time, minutes	0.07	Follower Density (FD), followers/mi/ln	3.2		
Vehicle LOS	B				
Bicycle Results					
Percent Occupied Parking	0	Pavement Condition Rating	4		

Flow Rate Outside Lane, veh/h	430	Bicycle Effective Width, ft	24
Bicycle LOS Score	7.47	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 15

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1478
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	382	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	19.53
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.22

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57671	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.28298	PF Power Coefficient (p)	0.76370
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.6
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1478	-	-	67.3

Vehicle Results

Average Speed, mi/h	67.3	Percent Followers, %	45.9
Segment Travel Time, minutes	0.25	Follower Density (FD), followers/mi/ln	2.6
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	382	Bicycle Effective Width, ft	24
Bicycle LOS Score	10.62	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 16

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	384
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	740	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	12.76
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.44

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29233	PF Power Coefficient (p)	0.75931
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	7.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	384	-	-	66.2

Vehicle Results			
Average Speed, mi/h	66.2	Percent Followers, %	64.2
Segment Travel Time, minutes	0.07	Follower Density (FD), followers/mi/ln	7.2
Vehicle LOS	C		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	740	Bicycle Effective Width, ft	24
Bicycle LOS Score	7.15	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 17

Vehicle Inputs			
Segment Type	Passing Constrained	Length, ft	3732
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	735	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	12.21
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.43

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.60878	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.21846	PF Power Coefficient (p)	0.78615
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	6.8
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3732	-	-	66.2

Vehicle Results			
Average Speed, mi/h	66.2	Percent Followers, %	61.6

Segment Travel Time, minutes		0.64	Follower Density (FD), followers/mi/ln		6.8
Vehicle LOS		C			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		735	Bicycle Effective Width, ft		24
Bicycle LOS Score		6.88	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 18					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1360
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		735	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		12.21
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.43
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57450	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29014	PF Power Coefficient (p)		0.76012
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		7.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1360	-	-	66.2
Vehicle Results					
Average Speed, mi/h		66.2	Percent Followers, %		64.0
Segment Travel Time, minutes		0.23	Follower Density (FD), followers/mi/ln		7.1
Vehicle LOS		C			

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	735	Bicycle Effective Width, ft	24
Bicycle LOS Score	6.88	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		
Segment 19			
Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	1595
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		735	Opposing Demand Flow Rate, veh/h		333
Peak Hour Factor		0.88	Total Trucks, %		12.21
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.43
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.36650	Speed Power Coefficient (p)		0.50865
PF Slope Coefficient (m)		-1.24703	PF Power Coefficient (p)		0.80540
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		6.9
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1595	-	-	66.5
Vehicle Results					
Average Speed, mi/h		66.5	Percent Followers, %		62.2
Segment Travel Time, minutes		0.27	Follower Density (FD), followers/mi/ln		6.9
Vehicle LOS		C			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		735	Bicycle Effective Width, ft		24
Bicycle LOS Score		6.88	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 20					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		595
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		735	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		12.21
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.43
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29239	PF Power Coefficient (p)		0.75923
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		7.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	595	-	-	66.2

Vehicle Results

Average Speed, mi/h	66.2	Percent Followers, %	64.1
Segment Travel Time, minutes	0.10	Follower Density (FD), followers/mi/ln	7.1
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	735	Bicycle Effective Width, ft	24
Bicycle LOS Score	6.88	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 21

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	958
Measured FFS	Measured	Free-Flow Speed, mi/h	55.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	551	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	10.81
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.32

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.43859	PF Power Coefficient (p)	0.72596
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	6.5
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	958	-	-	51.7

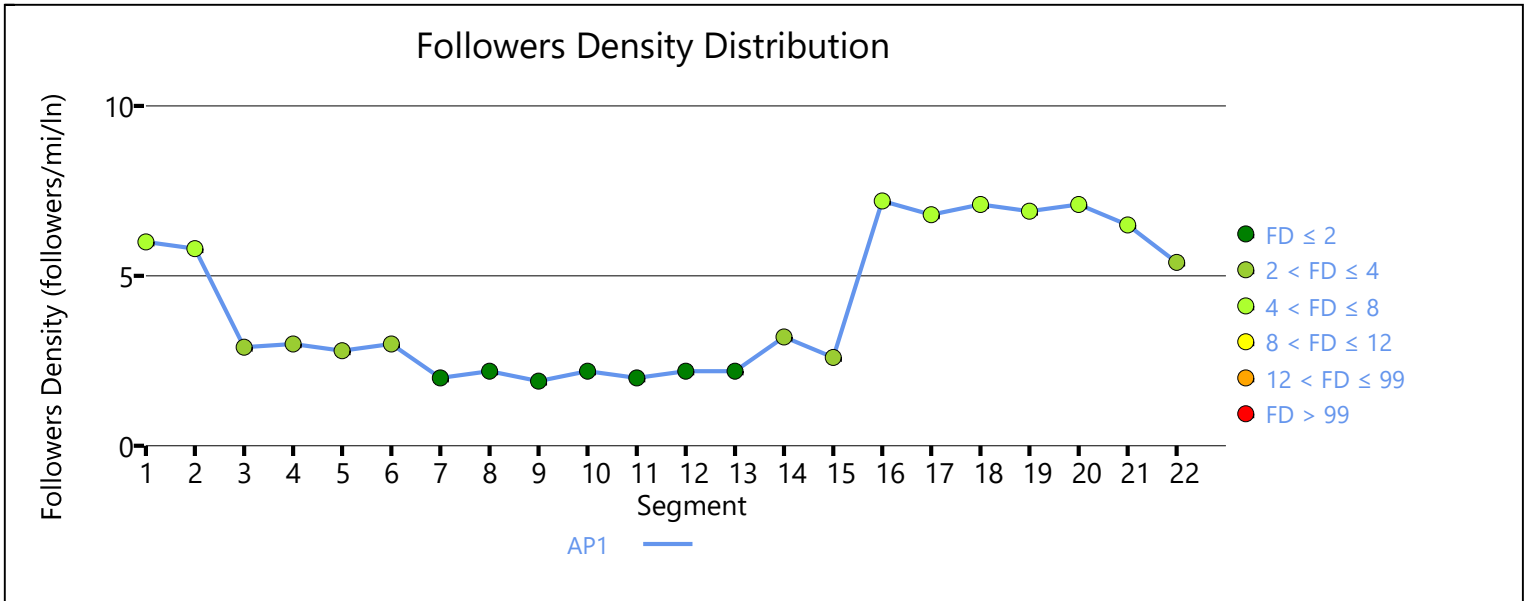
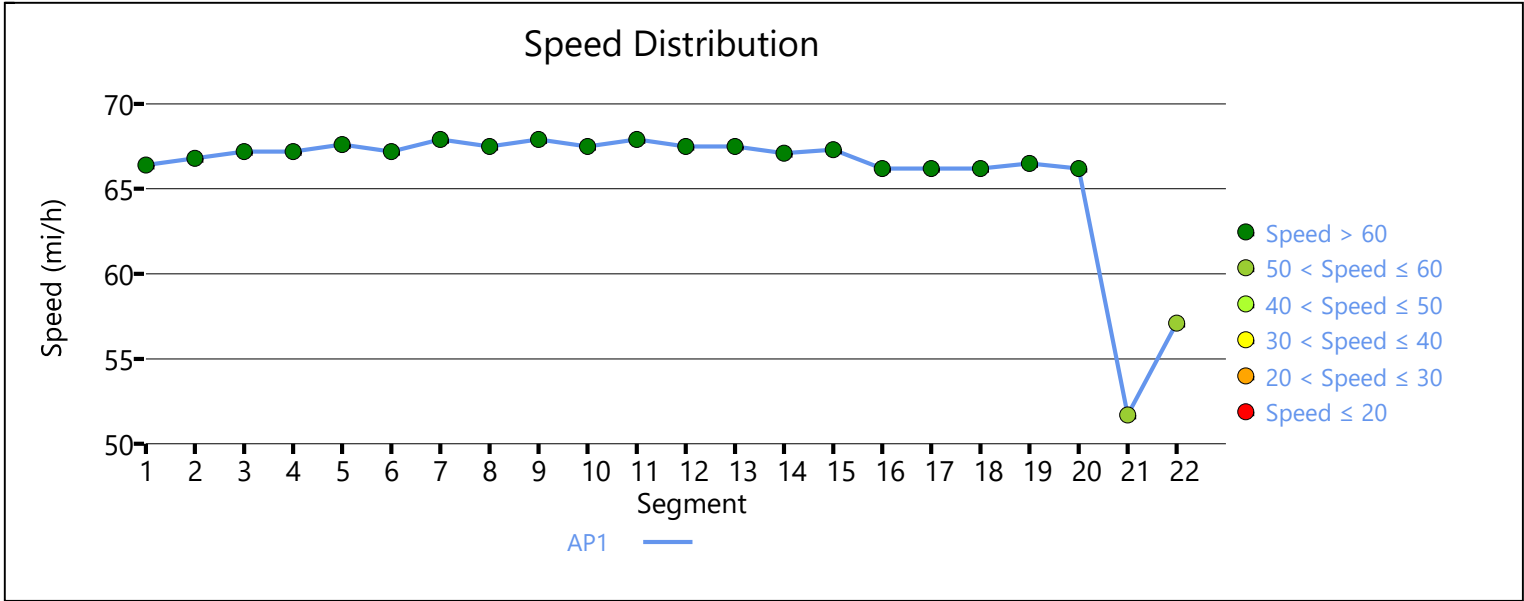
Vehicle Results

Average Speed, mi/h	51.7	Percent Followers, %	60.7
Segment Travel Time, minutes	0.21	Follower Density (FD), followers/mi/ln	6.5
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	551	Bicycle Effective Width, ft	24
Bicycle LOS Score	5.68	Bicycle Effective Speed Factor	4.62
Bicycle LOS	F		

Segment 22					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1659
Measured FFS		Measured	Free-Flow Speed, mi/h		60.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		551	Opposing Demand Flow Rate, veh/h		299
Peak Hour Factor		0.88	Total Trucks, %		10.81
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.32
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		60.0
Speed Slope Coefficient (m)		4.35768	Speed Power Coefficient (p)		0.51544
PF Slope Coefficient (m)		-1.30606	PF Power Coefficient (p)		0.78393
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		5.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1659	-	-	57.1
Vehicle Results					
Average Speed, mi/h		57.1	Percent Followers, %		55.9
Segment Travel Time, minutes		0.33	Follower Density (FD), followers/mi/ln		5.4
Vehicle LOS		C			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		551	Bicycle Effective Width, ft		24
Bicycle LOS Score		5.68	Bicycle Effective Speed Factor		4.62
Bicycle LOS		F			
Facility Results					
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln		LOS
1	690	0.47	4.0		C



HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	5/11/2023
Agency	HRG	Analysis Year	2040 NB
Jurisdiction	SDDOT	Time Analyzed	AM Peak
Project Description	West of Hartford SD 38 EB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1069
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	202	Opposing Demand Flow Rate, veh/h	142
Peak Hour Factor	0.88	Total Trucks, %	5.79
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.12

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.29579	Speed Power Coefficient (p)	0.55752
PF Slope Coefficient (m)	-1.22341	PF Power Coefficient (p)	0.81179
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.8
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1069	-	-	68.8

Vehicle Results

Average Speed, mi/h	68.8	Percent Followers, %	28.4
Segment Travel Time, minutes	0.18	Follower Density (FD), followers/mi/ln	0.8
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	202	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.61	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 2

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	664
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity							
Directional Demand Flow Rate, veh/h		202		Opposing Demand Flow Rate, veh/h		-	
Peak Hour Factor		0.88		Total Trucks, %		5.79	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.12	
Intermediate Results							
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0	
Speed Slope Coefficient (m)		4.57372		Speed Power Coefficient (p)		0.41674	
PF Slope Coefficient (m)		-1.29315		PF Power Coefficient (p)		0.75829	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		0.9	
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0	
Subsegment Data							
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h		
1	Tangent	664	-	-	68.2		
Vehicle Results							
Average Speed, mi/h		68.2		Percent Followers, %		31.9	
Segment Travel Time, minutes		0.11		Follower Density (FD), followers/mi/ln		0.9	
Vehicle LOS		A					
Bicycle Results							
Percent Occupied Parking		0		Pavement Condition Rating		4	
Flow Rate Outside Lane, veh/h		202		Bicycle Effective Width, ft		24	
Bicycle LOS Score		3.61		Bicycle Effective Speed Factor		5.07	
Bicycle LOS		D					
Segment 3							
Vehicle Inputs							
Segment Type		Passing Zone		Length, ft		1871	
Measured FFS		Measured		Free-Flow Speed, mi/h		70.0	
Demand and Capacity							
Directional Demand Flow Rate, veh/h		202		Opposing Demand Flow Rate, veh/h		142	
Peak Hour Factor		0.88		Total Trucks, %		5.79	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.12	
Intermediate Results							
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0	
Speed Slope Coefficient (m)		4.30560		Speed Power Coefficient (p)		0.55752	
PF Slope Coefficient (m)		-1.19854		PF Power Coefficient (p)		0.82311	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		0.8	
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0	
Subsegment Data							

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1871	-	-	68.8

Vehicle Results

Average Speed, mi/h	68.8	Percent Followers, %	27.5
Segment Travel Time, minutes	0.31	Follower Density (FD), followers/mi/ln	0.8
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	202	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.61	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 4

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	925
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	202	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	5.79
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.12

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29315	PF Power Coefficient (p)	0.75829
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.9
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	925	-	-	68.2

Vehicle Results

Average Speed, mi/h	68.2	Percent Followers, %	31.9
Segment Travel Time, minutes	0.15	Follower Density (FD), followers/mi/ln	0.9
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	202	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.61	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Zone		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				4476	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		202		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.88		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.12	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
Speed Slope Coefficient (m)		4.33909		Speed Power Coefficient (p)	
PF Slope Coefficient (m)		-1.14461		PF Power Coefficient (p)	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln	
%Improvement to Percent Followers		0.0		%Improvement to Speed	
				0.0	
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	4476	-	-	68.8
Vehicle Results					
Average Speed, mi/h		68.8		Percent Followers, %	
Segment Travel Time, minutes		0.74		Follower Density (FD), followers/mi/ln	
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0		Pavement Condition Rating	
Flow Rate Outside Lane, veh/h		202		Bicycle Effective Width, ft	
Bicycle LOS Score		3.61		Bicycle Effective Speed Factor	
Bicycle LOS		D			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				896	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		202		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.88		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.12	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
				70.0	

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29315	PF Power Coefficient (p)	0.75829
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.9
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	896	-	-	68.2

Vehicle Results

Average Speed, mi/h	68.2	Percent Followers, %	31.9
Segment Travel Time, minutes	0.15	Follower Density (FD), followers/mi/ln	0.9
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	202	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.61	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 7

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	743
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	202	Opposing Demand Flow Rate, veh/h	142
Peak Hour Factor	0.88	Total Trucks, %	5.79
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.12

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.29579	Speed Power Coefficient (p)	0.55752
PF Slope Coefficient (m)	-1.22341	PF Power Coefficient (p)	0.81179
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.8
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	743	-	-	68.8

Vehicle Results

Average Speed, mi/h	68.8	Percent Followers, %	28.4
Segment Travel Time, minutes	0.12	Follower Density (FD), followers/mi/ln	0.8
Vehicle LOS	A		

Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		202	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.61	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 8					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		2717
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		203	Opposing Demand Flow Rate, veh/h		138
Peak Hour Factor		0.88	Total Trucks, %		3.28
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.12
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.31617	Speed Power Coefficient (p)		0.55915
PF Slope Coefficient (m)		-1.17188	PF Power Coefficient (p)		0.83428
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.8
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2717	-	-	68.8
Vehicle Results					
Average Speed, mi/h		68.8	Percent Followers, %		26.7
Segment Travel Time, minutes		0.45	Follower Density (FD), followers/mi/ln		0.8
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		203	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.84	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 9					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1013
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					

Directional Demand Flow Rate, veh/h	203	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	3.28
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.12

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29345	PF Power Coefficient (p)	0.75792
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1013	-	-	68.2

Vehicle Results

Average Speed, mi/h	68.2	Percent Followers, %	32.1
Segment Travel Time, minutes	0.17	Follower Density (FD), followers/mi/ln	1.0
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	203	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.84	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 10

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	4569
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	203	Opposing Demand Flow Rate, veh/h	138
Peak Hour Factor	0.88	Total Trucks, %	3.28
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.12

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.33807	Speed Power Coefficient (p)	0.55915
PF Slope Coefficient (m)	-1.14272	PF Power Coefficient (p)	0.84376
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.8
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
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1	Tangent	4569	-	-	68.8
Vehicle Results					
Average Speed, mi/h		68.8	Percent Followers, %		25.8
Segment Travel Time, minutes		0.75	Follower Density (FD), followers/mi/ln		0.8
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		203	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.84	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		5676
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		203	Opposing Demand Flow Rate, veh/h		138
Peak Hour Factor		0.88	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.12
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.34904	Speed Power Coefficient (p)		0.55915
PF Slope Coefficient (m)		-1.13517	PF Power Coefficient (p)		0.84345
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.8
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5676	-	-	68.8
Vehicle Results					
Average Speed, mi/h		68.8	Percent Followers, %		25.6
Segment Travel Time, minutes		0.94	Follower Density (FD), followers/mi/ln		0.8
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		203	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.71	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 12					

Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		657
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		203	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.12
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29350	PF Power Coefficient (p)		0.75785
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.0
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	657	-	-	68.2
Vehicle Results					
Average Speed, mi/h		68.2	Percent Followers, %		32.1
Segment Travel Time, minutes		0.11	Follower Density (FD), followers/mi/ln		1.0
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		203	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.71	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		6009
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		203	Opposing Demand Flow Rate, veh/h		138
Peak Hour Factor		0.88	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.12
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.35213	Speed Power Coefficient (p)		0.55915
PF Slope Coefficient (m)		-1.13386	PF Power Coefficient (p)		0.84277

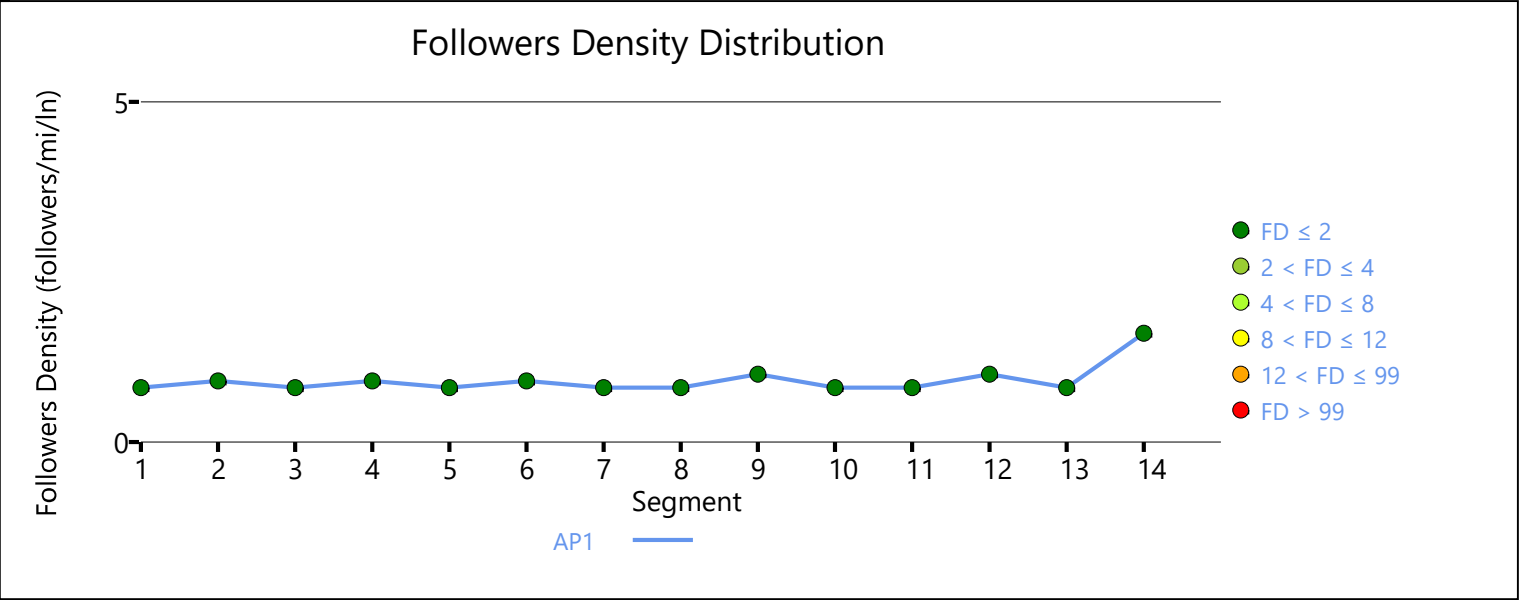
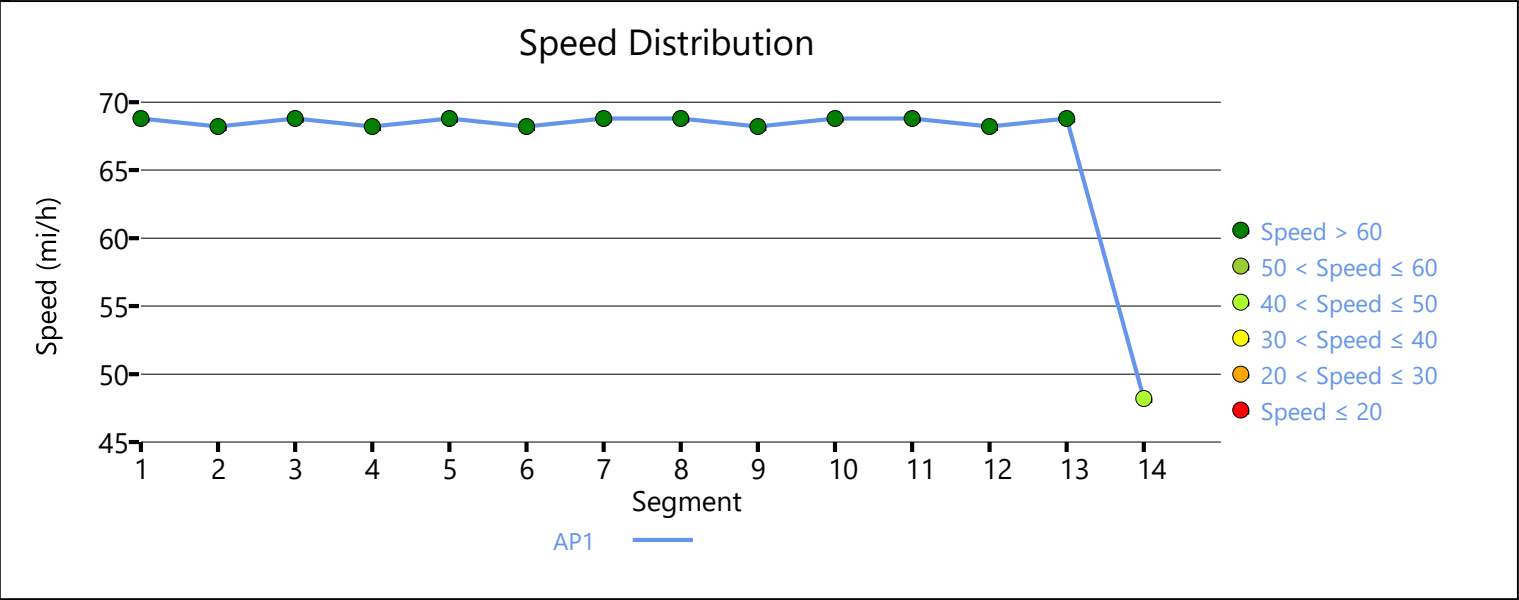
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.8
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	6009	-	-	68.8
Vehicle Results					
Average Speed, mi/h		68.8	Percent Followers, %		25.6
Segment Travel Time, minutes		0.99	Follower Density (FD), followers/mi/ln		0.8
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		203	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.71	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 14					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		891
Measured FFS		Measured	Free-Flow Speed, mi/h		50.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		203	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.12
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		50.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.47375	PF Power Coefficient (p)		0.71164
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	891	-	-	48.2
Vehicle Results					
Average Speed, mi/h		48.2	Percent Followers, %		37.8
Segment Travel Time, minutes		0.21	Follower Density (FD), followers/mi/ln		1.6
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4

Flow Rate Outside Lane, veh/h	203	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.49	Bicycle Effective Speed Factor	4.42
Bicycle LOS	B		

Facility Results

T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	272	0.08	0.8	A



HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	5/11/2023
Agency	HRG	Analysis Year	2040 NB
Jurisdiction	SDDOT	Time Analyzed	PM Peak
Project Description	West of Hartford SD 38 EB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1069
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	127	Opposing Demand Flow Rate, veh/h	227
Peak Hour Factor	0.88	Total Trucks, %	5.79
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.07

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.32852	Speed Power Coefficient (p)	0.53193
PF Slope Coefficient (m)	-1.24407	PF Power Coefficient (p)	0.80506
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.4
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1069	-	-	69.4

Vehicle Results

Average Speed, mi/h	69.4	Percent Followers, %	21.1
Segment Travel Time, minutes	0.18	Follower Density (FD), followers/mi/ln	0.4
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	127	Bicycle Effective Width, ft	32
Bicycle LOS Score	1.14	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 2

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	664
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		127	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		5.79
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.07
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29315	PF Power Coefficient (p)		0.75829
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	664	-	-	69.0
Vehicle Results					
Average Speed, mi/h		69.0	Percent Followers, %		23.7
Segment Travel Time, minutes		0.11	Follower Density (FD), followers/mi/ln		0.4
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		127	Bicycle Effective Width, ft		32
Bicycle LOS Score		1.14	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 3					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1871
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		127	Opposing Demand Flow Rate, veh/h		227
Peak Hour Factor		0.88	Total Trucks, %		5.79
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.07
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.33833	Speed Power Coefficient (p)		0.53193
PF Slope Coefficient (m)		-1.21872	PF Power Coefficient (p)		0.81609
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1871	-	-	69.4

Vehicle Results

Average Speed, mi/h	69.4	Percent Followers, %	20.3
Segment Travel Time, minutes	0.31	Follower Density (FD), followers/mi/ln	0.4
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	127	Bicycle Effective Width, ft	32
Bicycle LOS Score	1.14	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 4

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	925
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	127	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	5.79
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.07

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29315	PF Power Coefficient (p)	0.75829
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.4
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	925	-	-	69.0

Vehicle Results

Average Speed, mi/h	69.0	Percent Followers, %	23.7
Segment Travel Time, minutes	0.15	Follower Density (FD), followers/mi/ln	0.4
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	127	Bicycle Effective Width, ft	32
Bicycle LOS Score	1.14	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Zone		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				4476	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		139		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.88		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.08	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
Speed Slope Coefficient (m)		4.37181		Speed Power Coefficient (p)	
PF Slope Coefficient (m)		-1.16375		PF Power Coefficient (p)	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln	
%Improvement to Percent Followers		0.0		%Improvement to Speed	
				0.0	
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	4476	-	-	69.2
Vehicle Results					
Average Speed, mi/h		69.2		Percent Followers, %	
Segment Travel Time, minutes		0.73		Follower Density (FD), followers/mi/ln	
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0		Pavement Condition Rating	
Flow Rate Outside Lane, veh/h		139		Bicycle Effective Width, ft	
Bicycle LOS Score		1.50		Bicycle Effective Speed Factor	
Bicycle LOS		A			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				896	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		127		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.88		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.07	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
				70.0	

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29315	PF Power Coefficient (p)	0.75829
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.4
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	896	-	-	69.0

Vehicle Results			
Average Speed, mi/h	69.0	Percent Followers, %	23.7
Segment Travel Time, minutes	0.15	Follower Density (FD), followers/mi/ln	0.4
Vehicle LOS	A		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	127	Bicycle Effective Width, ft	32
Bicycle LOS Score	1.14	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 7

Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	743
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	127	Opposing Demand Flow Rate, veh/h	227
Peak Hour Factor	0.88	Total Trucks, %	5.79
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.07

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.32852	Speed Power Coefficient (p)	0.53193
PF Slope Coefficient (m)	-1.24407	PF Power Coefficient (p)	0.80506
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.4
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	743	-	-	69.4

Vehicle Results			
Average Speed, mi/h	69.4	Percent Followers, %	21.1
Segment Travel Time, minutes	0.12	Follower Density (FD), followers/mi/ln	0.4
Vehicle LOS	A		

Bicycle Results											
Percent Occupied Parking		0		Pavement Condition Rating		4					
Flow Rate Outside Lane, veh/h		127		Bicycle Effective Width, ft		32					
Bicycle LOS Score		1.14		Bicycle Effective Speed Factor		5.07					
Bicycle LOS		A									
Segment 8											
Vehicle Inputs											
Segment Type		Passing Zone		Length, ft		2717					
Measured FFS		Measured		Free-Flow Speed, mi/h		70.0					
Demand and Capacity											
Directional Demand Flow Rate, veh/h		134		Opposing Demand Flow Rate, veh/h		0					
Peak Hour Factor		0.88		Total Trucks, %		3.28					
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.08					
Intermediate Results											
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0					
Speed Slope Coefficient (m)		4.19461		Speed Power Coefficient (p)		0.67576					
PF Slope Coefficient (m)		-1.07584		PF Power Coefficient (p)		0.86675					
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		0.3					
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0					
Subsegment Data											
#	Segment Type		Length, ft		Radius, ft		Superelevation, %		Average Speed, mi/h		
1	Tangent		2717		-		-		69.6		
Vehicle Results											
Average Speed, mi/h			69.6			Percent Followers, %			17.2		
Segment Travel Time, minutes			0.44			Follower Density (FD), followers/mi/ln			0.3		
Vehicle LOS			A								
Bicycle Results											
Percent Occupied Parking			0			Pavement Condition Rating			4		
Flow Rate Outside Lane, veh/h			134			Bicycle Effective Width, ft			31		
Bicycle LOS Score			0.70			Bicycle Effective Speed Factor			5.07		
Bicycle LOS			A								
Segment 9											
Vehicle Inputs											
Segment Type			Passing Constrained			Length, ft			1013		
Measured FFS			Measured			Free-Flow Speed, mi/h			70.0		
Demand and Capacity											

Directional Demand Flow Rate, veh/h		134	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		3.28
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.08
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29345	PF Power Coefficient (p)		0.75792
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1013	-	-	68.9
Vehicle Results					
Average Speed, mi/h		68.9	Percent Followers, %		24.6
Segment Travel Time, minutes		0.17	Follower Density (FD), followers/mi/ln		0.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		134	Bicycle Effective Width, ft		31
Bicycle LOS Score		0.70	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		4569
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		134	Opposing Demand Flow Rate, veh/h		230
Peak Hour Factor		0.88	Total Trucks, %		3.28
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.08
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.37357	Speed Power Coefficient (p)		0.53135
PF Slope Coefficient (m)		-1.16352	PF Power Coefficient (p)		0.83544
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	4569	-	-	69.3
Vehicle Results					
Average Speed, mi/h		69.3	Percent Followers, %		19.5
Segment Travel Time, minutes		0.75	Follower Density (FD), followers/mi/ln		0.4
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		134	Bicycle Effective Width, ft		31
Bicycle LOS Score		0.70	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		5676
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		136	Opposing Demand Flow Rate, veh/h		230
Peak Hour Factor		0.88	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.08
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.38454	Speed Power Coefficient (p)		0.53135
PF Slope Coefficient (m)		-1.15581	PF Power Coefficient (p)		0.83503
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5676	-	-	69.2
Vehicle Results					
Average Speed, mi/h		69.2	Percent Followers, %		19.7
Segment Travel Time, minutes		0.93	Follower Density (FD), followers/mi/ln		0.4
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		136	Bicycle Effective Width, ft		31
Bicycle LOS Score		0.58	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 12					

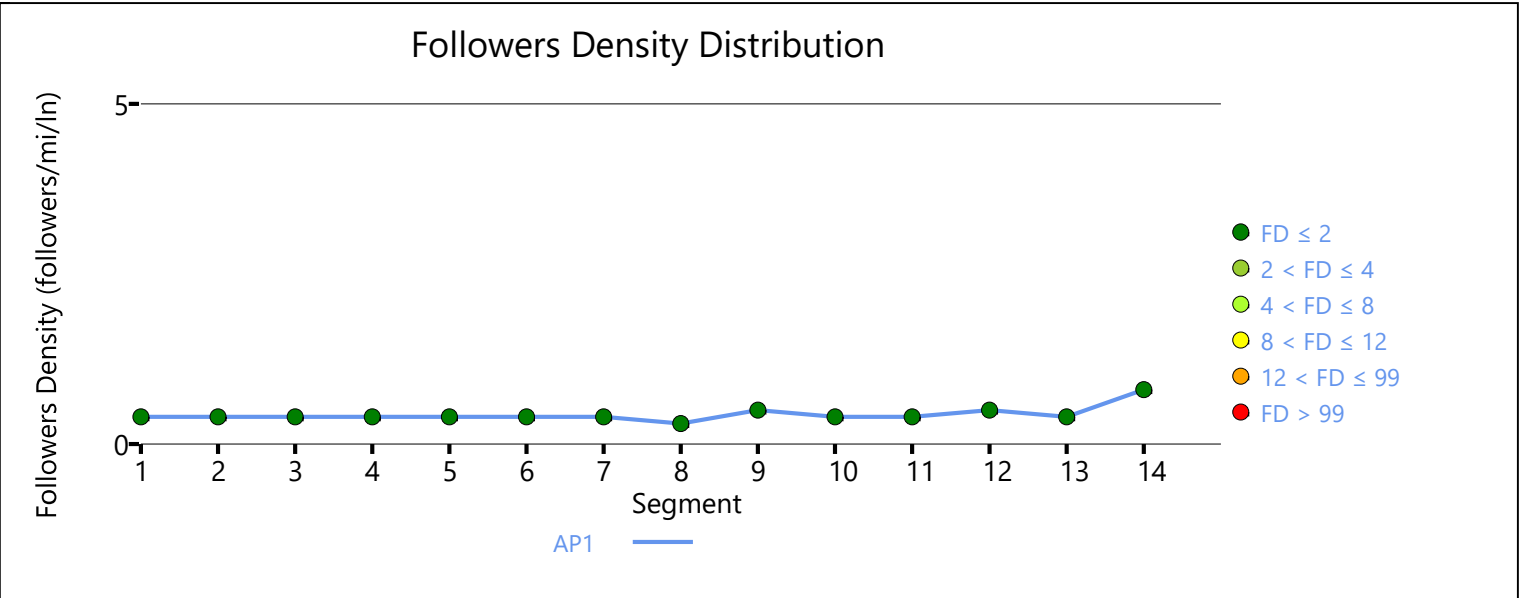
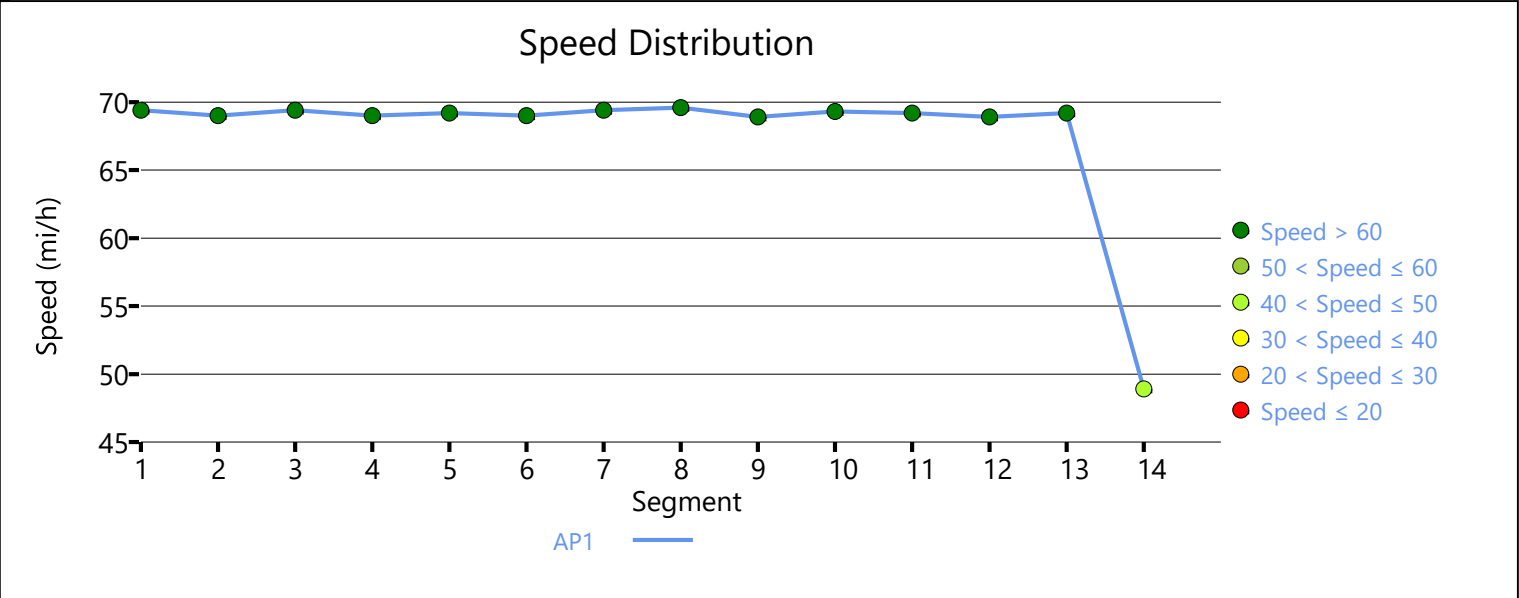
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		657
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		136	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.08
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29350	PF Power Coefficient (p)		0.75785
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	657	-	-	68.9
Vehicle Results					
Average Speed, mi/h		68.9	Percent Followers, %		24.9
Segment Travel Time, minutes		0.11	Follower Density (FD), followers/mi/ln		0.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		136	Bicycle Effective Width, ft		31
Bicycle LOS Score		0.58	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		6009
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		136	Opposing Demand Flow Rate, veh/h		230
Peak Hour Factor		0.88	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.08
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.38763	Speed Power Coefficient (p)		0.53135
PF Slope Coefficient (m)		-1.15447	PF Power Coefficient (p)		0.83434

In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	6009	-	-	69.2
Vehicle Results					
Average Speed, mi/h		69.2	Percent Followers, %		19.7
Segment Travel Time, minutes		0.99	Follower Density (FD), followers/mi/ln		0.4
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		136	Bicycle Effective Width, ft		31
Bicycle LOS Score		0.58	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 14					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		891
Measured FFS		Measured	Free-Flow Speed, mi/h		50.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		136	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.08
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		50.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.47375	PF Power Coefficient (p)		0.71164
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.8
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	891	-	-	48.9
Vehicle Results					
Average Speed, mi/h		48.9	Percent Followers, %		30.0
Segment Travel Time, minutes		0.21	Follower Density (FD), followers/mi/ln		0.8
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4

Flow Rate Outside Lane, veh/h	136	Bicycle Effective Width, ft	31
Bicycle LOS Score	0.36	Bicycle Effective Speed Factor	4.42
Bicycle LOS	A		

Facility Results				
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	180	0.03	0.4	A



HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	5/11/2023
Agency	HRG	Analysis Year	2040 NB
Jurisdiction	SDDOT	Time Analyzed	AM Peak
Project Description	WB 38 West of Hartford	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	10549
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	138	Opposing Demand Flow Rate, veh/h	203
Peak Hour Factor	0.88	Total Trucks, %	12.50
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.08

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.41409	Speed Power Coefficient (p)	0.53829
PF Slope Coefficient (m)	-1.15918	PF Power Coefficient (p)	0.81052
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.4
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	10549	-	-	69.2

Vehicle Results

Average Speed, mi/h	69.2	Percent Followers, %	20.7
Segment Travel Time, minutes	1.73	Follower Density (FD), followers/mi/ln	0.4
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	138	Bicycle Effective Width, ft	31
Bicycle LOS Score	4.24	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 2

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	2793
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity							
Directional Demand Flow Rate, veh/h		138		Opposing Demand Flow Rate, veh/h		203	
Peak Hour Factor		0.88		Total Trucks, %		12.50	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.08	
Intermediate Results							
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0	
Speed Slope Coefficient (m)		4.34348		Speed Power Coefficient (p)		0.53829	
PF Slope Coefficient (m)		-1.18524		PF Power Coefficient (p)		0.83047	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		0.4	
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0	
Subsegment Data							
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h		
1	Tangent	2793	-	-	69.3		
Vehicle Results							
Average Speed, mi/h		69.3		Percent Followers, %		20.4	
Segment Travel Time, minutes		0.46		Follower Density (FD), followers/mi/ln		0.4	
Vehicle LOS		A					
Bicycle Results							
Percent Occupied Parking		0		Pavement Condition Rating		4	
Flow Rate Outside Lane, veh/h		138		Bicycle Effective Width, ft		31	
Bicycle LOS Score		4.24		Bicycle Effective Speed Factor		5.07	
Bicycle LOS		D					
Segment 3							
Vehicle Inputs							
Segment Type		Passing Zone		Length, ft		3825	
Measured FFS		Measured		Free-Flow Speed, mi/h		70.0	
Demand and Capacity							
Directional Demand Flow Rate, veh/h		138		Opposing Demand Flow Rate, veh/h		203	
Peak Hour Factor		0.88		Total Trucks, %		2.40	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.08	
Intermediate Results							
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0	
Speed Slope Coefficient (m)		4.35622		Speed Power Coefficient (p)		0.53829	
PF Slope Coefficient (m)		-1.16728		PF Power Coefficient (p)		0.83549	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		0.4	
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0	
Subsegment Data							

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3825	-	-	69.3

Vehicle Results

Average Speed, mi/h	69.3	Percent Followers, %	19.9
Segment Travel Time, minutes	0.63	Follower Density (FD), followers/mi/ln	0.4
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	138	Bicycle Effective Width, ft	31
Bicycle LOS Score	0.48	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 4

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	791
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	138	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	2.40
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.08

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29355	PF Power Coefficient (p)	0.75779
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.5
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	791	-	-	68.8

Vehicle Results

Average Speed, mi/h	68.8	Percent Followers, %	25.0
Segment Travel Time, minutes	0.13	Follower Density (FD), followers/mi/ln	0.5
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	138	Bicycle Effective Width, ft	31
Bicycle LOS Score	0.48	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft	3414	
Measured FFS		Measured	Free-Flow Speed, mi/h	70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		138	Opposing Demand Flow Rate, veh/h		203
Peak Hour Factor		0.88	Total Trucks, %		2.40
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.08
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.35138	Speed Power Coefficient (p)		0.53829
PF Slope Coefficient (m)		-1.17373	PF Power Coefficient (p)		0.83350
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3414	-	-	69.3
Vehicle Results					
Average Speed, mi/h		69.3	Percent Followers, %		20.1
Segment Travel Time, minutes		0.56	Follower Density (FD), followers/mi/ln		0.4
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		138	Bicycle Effective Width, ft		31
Bicycle LOS Score		0.48	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft	286	
Measured FFS		Measured	Free-Flow Speed, mi/h	70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		138	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.40
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.08
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29355	PF Power Coefficient (p)	0.75779
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.5
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	286	-	-	68.8

Vehicle Results

Average Speed, mi/h	68.8	Percent Followers, %	25.0
Segment Travel Time, minutes	0.05	Follower Density (FD), followers/mi/ln	0.5
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	138	Bicycle Effective Width, ft	31
Bicycle LOS Score	0.48	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 7

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	463
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	142	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	2.60
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.08

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29353	PF Power Coefficient (p)	0.75782
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.5
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	463	-	-	68.8

Vehicle Results

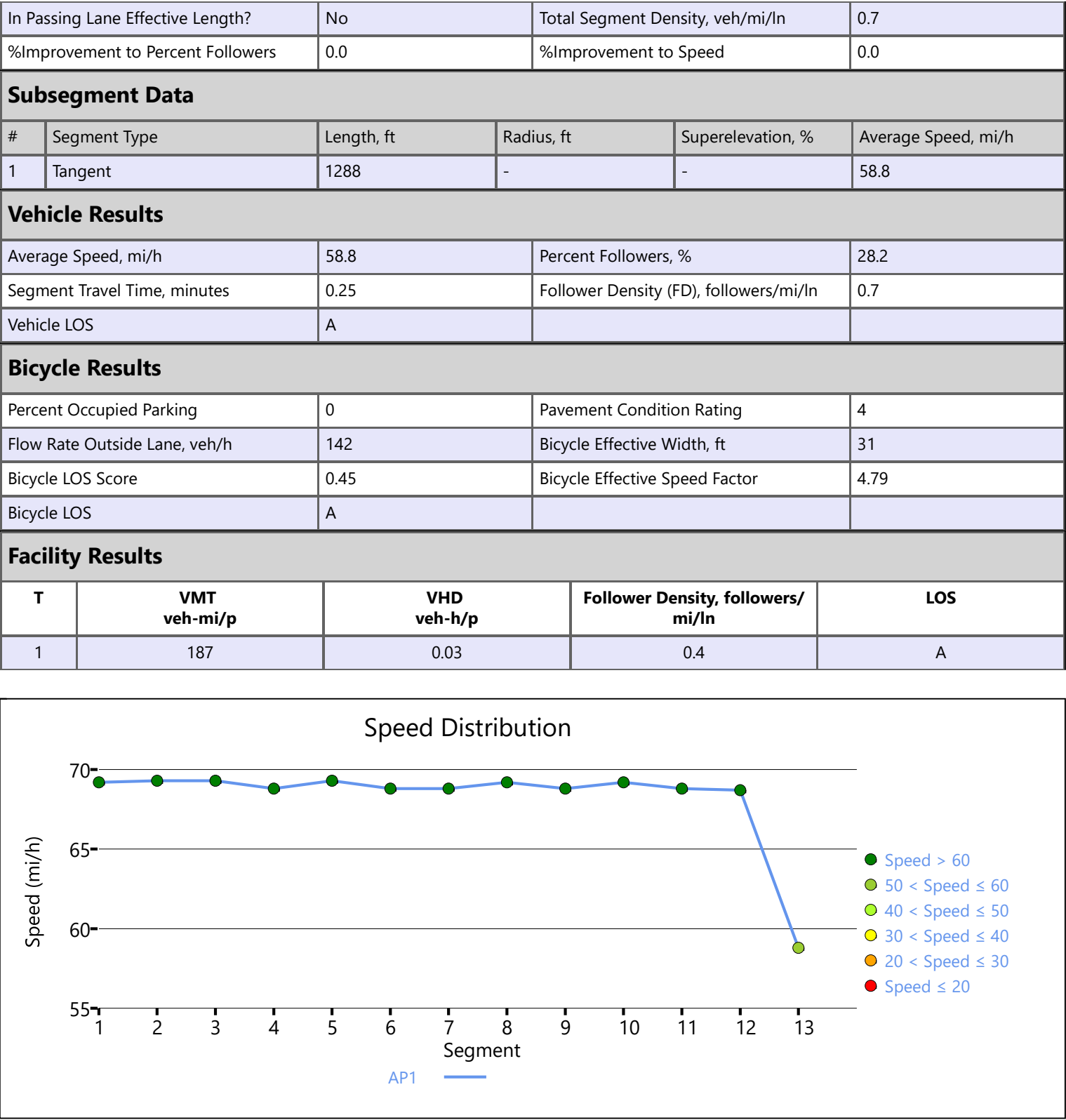
Average Speed, mi/h	68.8	Percent Followers, %	25.5
Segment Travel Time, minutes	0.08	Follower Density (FD), followers/mi/ln	0.5
Vehicle LOS	A		

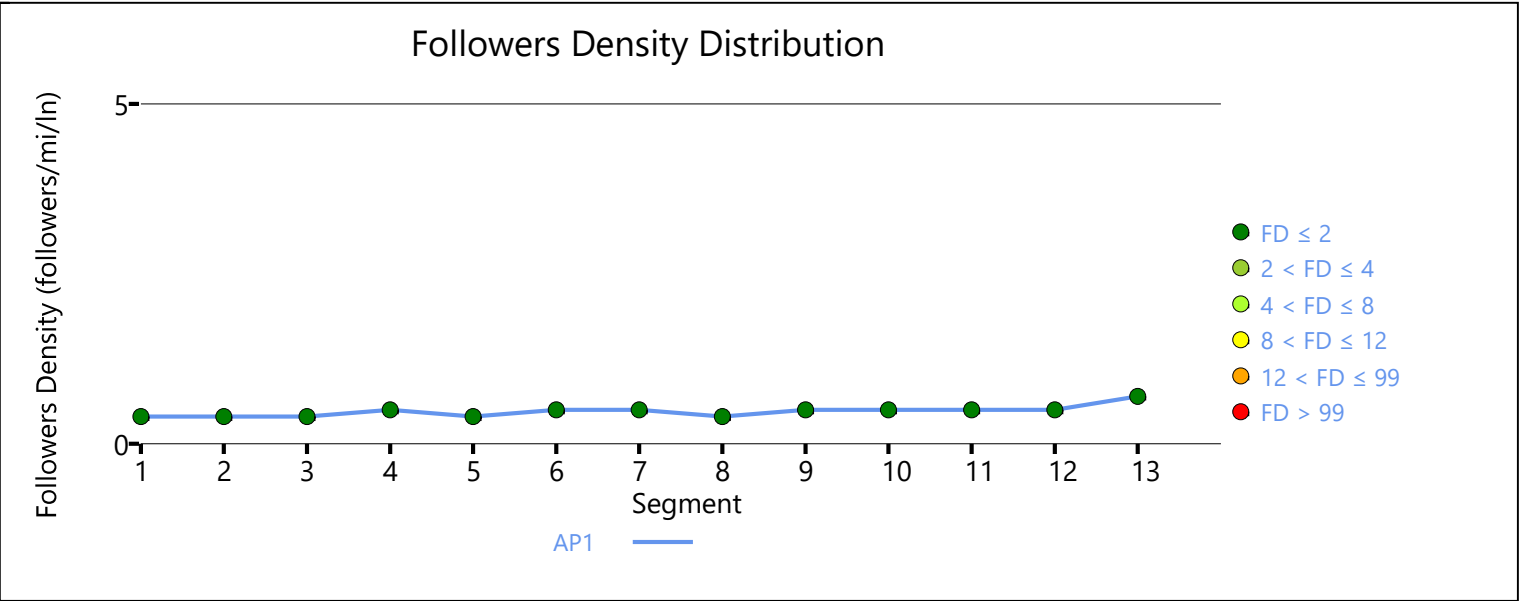
Bicycle Results					
Percent Occupied Parking	0	Pavement Condition Rating	4		
Flow Rate Outside Lane, veh/h	142	Bicycle Effective Width, ft	31		
Bicycle LOS Score	0.54	Bicycle Effective Speed Factor	5.07		
Bicycle LOS	A				
Segment 8					
Vehicle Inputs					
Segment Type	Passing Zone	Length, ft	4822		
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0		
Demand and Capacity					
Directional Demand Flow Rate, veh/h	142	Opposing Demand Flow Rate, veh/h	202		
Peak Hour Factor	0.88	Total Trucks, %	2.60		
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.08		
Intermediate Results					
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0		
Speed Slope Coefficient (m)	4.36656	Speed Power Coefficient (p)	0.53861		
PF Slope Coefficient (m)	-1.15601	PF Power Coefficient (p)	0.83777		
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.4		
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0		
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	4822	-	-	69.2
Vehicle Results					
Average Speed, mi/h	69.2	Percent Followers, %	20.2		
Segment Travel Time, minutes	0.79	Follower Density (FD), followers/mi/ln	0.4		
Vehicle LOS	A				
Bicycle Results					
Percent Occupied Parking	0	Pavement Condition Rating	4		
Flow Rate Outside Lane, veh/h	142	Bicycle Effective Width, ft	31		
Bicycle LOS Score	0.54	Bicycle Effective Speed Factor	5.07		
Bicycle LOS	A				
Segment 9					
Vehicle Inputs					
Segment Type	Passing Constrained	Length, ft	861		
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0		
Demand and Capacity					

Directional Demand Flow Rate, veh/h		142	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.60
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.08
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29353	PF Power Coefficient (p)		0.75782
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	861	-	-	68.8
Vehicle Results					
Average Speed, mi/h		68.8	Percent Followers, %		25.5
Segment Travel Time, minutes		0.14	Follower Density (FD), followers/mi/ln		0.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		142	Bicycle Effective Width, ft		31
Bicycle LOS Score		0.54	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1556
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		142	Opposing Demand Flow Rate, veh/h		202
Peak Hour Factor		0.88	Total Trucks, %		2.60
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.08
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.32409	Speed Power Coefficient (p)		0.53861
PF Slope Coefficient (m)		-1.22723	PF Power Coefficient (p)		0.81163
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	1556	-	-	69.2
Vehicle Results					
Average Speed, mi/h		69.2	Percent Followers, %		22.3
Segment Travel Time, minutes		0.26	Follower Density (FD), followers/mi/ln		0.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		142	Bicycle Effective Width, ft		31
Bicycle LOS Score		0.54	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		799
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		142	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.60
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.08
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29353	PF Power Coefficient (p)		0.75782
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	799	-	-	68.8
Vehicle Results					
Average Speed, mi/h		68.8	Percent Followers, %		25.5
Segment Travel Time, minutes		0.13	Follower Density (FD), followers/mi/ln		0.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		142	Bicycle Effective Width, ft		31
Bicycle LOS Score		0.54	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 12					

Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		857
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		142	Opposing Demand Flow Rate, veh/h		2026
Peak Hour Factor		0.88	Total Trucks, %		2.60
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.08
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.63885	Speed Power Coefficient (p)		0.40883
PF Slope Coefficient (m)		-1.27385	PF Power Coefficient (p)		0.74571
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	857	-	-	68.7
Vehicle Results					
Average Speed, mi/h		68.7	Percent Followers, %		25.7
Segment Travel Time, minutes		0.14	Follower Density (FD), followers/mi/ln		0.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		142	Bicycle Effective Width, ft		31
Bicycle LOS Score		0.54	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1288
Measured FFS		Measured	Free-Flow Speed, mi/h		60.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		142	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.60
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.08
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		60.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.39677	PF Power Coefficient (p)		0.73640





HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	5/11/2023
Agency	HRG	Analysis Year	2040 NB
Jurisdiction	SDDOT	Time Analyzed	PM Peak
Project Description	WB 38 West of Hartford	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	10549
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	230	Opposing Demand Flow Rate, veh/h	136
Peak Hour Factor	0.88	Total Trucks, %	1.94
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.14

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.38729	Speed Power Coefficient (p)	0.55957
PF Slope Coefficient (m)	-1.14432	PF Power Coefficient (p)	0.81520
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	10549	-	-	68.6

Vehicle Results

Average Speed, mi/h	68.6	Percent Followers, %	29.2
Segment Travel Time, minutes	1.75	Follower Density (FD), followers/mi/ln	1.0
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	230	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.54	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 2

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	2793
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		230	Opposing Demand Flow Rate, veh/h		136
Peak Hour Factor		0.88	Total Trucks, %		1.94
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.14
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.31669	Speed Power Coefficient (p)		0.55957
PF Slope Coefficient (m)		-1.16990	PF Power Coefficient (p)		0.83492
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.0
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2793	-	-	68.6
Vehicle Results					
Average Speed, mi/h		68.6	Percent Followers, %		29.0
Segment Travel Time, minutes		0.46	Follower Density (FD), followers/mi/ln		1.0
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		230	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.54	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 3					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		3825
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		230	Opposing Demand Flow Rate, veh/h		134
Peak Hour Factor		0.88	Total Trucks, %		2.19
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.14
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.32842	Speed Power Coefficient (p)		0.56040
PF Slope Coefficient (m)		-1.15048	PF Power Coefficient (p)		0.84195
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.9
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3825	-	-	68.6

Vehicle Results

Average Speed, mi/h	68.6	Percent Followers, %	28.3
Segment Travel Time, minutes	0.63	Follower Density (FD), followers/mi/ln	0.9
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	230	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.61	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 4

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	791
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	230	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	2.19
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.14

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29358	PF Power Coefficient (p)	0.75776
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	791	-	-	68.0

Vehicle Results

Average Speed, mi/h	68.0	Percent Followers, %	34.6
Segment Travel Time, minutes	0.13	Follower Density (FD), followers/mi/ln	1.2
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	230	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.61	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Zone		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				3414	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		230		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.88		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.14	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
Speed Slope Coefficient (m)		4.32358		Speed Power Coefficient (p)	
PF Slope Coefficient (m)		-1.15683		PF Power Coefficient (p)	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln	
%Improvement to Percent Followers		0.0		%Improvement to Speed	
				0.0	
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3414	-	-	68.6
Vehicle Results					
Average Speed, mi/h		68.6		Percent Followers, %	
Segment Travel Time, minutes		0.57		Follower Density (FD), followers/mi/ln	
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0		Pavement Condition Rating	
Flow Rate Outside Lane, veh/h		230		Bicycle Effective Width, ft	
Bicycle LOS Score		2.61		Bicycle Effective Speed Factor	
Bicycle LOS		C			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				286	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		230		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.88		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.14	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
				70.0	

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29358	PF Power Coefficient (p)	0.75776
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	286	-	-	68.0

Vehicle Results

Average Speed, mi/h	68.0	Percent Followers, %	34.6
Segment Travel Time, minutes	0.05	Follower Density (FD), followers/mi/ln	1.2
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	230	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.61	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 7

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	463
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	227	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	3.08
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.13

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29347	PF Power Coefficient (p)	0.75789
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.1
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	463	-	-	68.1

Vehicle Results

Average Speed, mi/h	68.1	Percent Followers, %	34.3
Segment Travel Time, minutes	0.08	Follower Density (FD), followers/mi/ln	1.1
Vehicle LOS	A		

Bicycle Results											
Percent Occupied Parking		0		Pavement Condition Rating		4					
Flow Rate Outside Lane, veh/h		227		Bicycle Effective Width, ft		24					
Bicycle LOS Score		2.84		Bicycle Effective Speed Factor		5.07					
Bicycle LOS		C									
Segment 8											
Vehicle Inputs											
Segment Type		Passing Zone		Length, ft		4822					
Measured FFS		Measured		Free-Flow Speed, mi/h		70.0					
Demand and Capacity											
Directional Demand Flow Rate, veh/h		227		Opposing Demand Flow Rate, veh/h		127					
Peak Hour Factor		0.88		Total Trucks, %		3.08					
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.13					
Intermediate Results											
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0					
Speed Slope Coefficient (m)		4.33608		Speed Power Coefficient (p)		0.56297					
PF Slope Coefficient (m)		-1.13758		PF Power Coefficient (p)		0.84510					
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		0.9					
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0					
Subsegment Data											
#	Segment Type		Length, ft		Radius, ft		Superelevation, %		Average Speed, mi/h		
1	Tangent		4822		-		-		68.6		
Vehicle Results											
Average Speed, mi/h			68.6			Percent Followers, %			27.8		
Segment Travel Time, minutes			0.80			Follower Density (FD), followers/mi/ln			0.9		
Vehicle LOS			A								
Bicycle Results											
Percent Occupied Parking			0			Pavement Condition Rating			4		
Flow Rate Outside Lane, veh/h			227			Bicycle Effective Width, ft			24		
Bicycle LOS Score			2.84			Bicycle Effective Speed Factor			5.07		
Bicycle LOS			C								
Segment 9											
Vehicle Inputs											
Segment Type			Passing Constrained			Length, ft			861		
Measured FFS			Measured			Free-Flow Speed, mi/h			70.0		
Demand and Capacity											

Directional Demand Flow Rate, veh/h		227	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		3.08
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.13
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29347	PF Power Coefficient (p)		0.75789
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	861	-	-	68.1
Vehicle Results					
Average Speed, mi/h		68.1	Percent Followers, %		34.3
Segment Travel Time, minutes		0.14	Follower Density (FD), followers/mi/ln		1.1
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		227	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.84	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1556
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		227	Opposing Demand Flow Rate, veh/h		127
Peak Hour Factor		0.88	Total Trucks, %		3.08
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.13
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.29360	Speed Power Coefficient (p)		0.56297
PF Slope Coefficient (m)		-1.20750	PF Power Coefficient (p)		0.81818
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.0
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	1556	-	-	68.7
Vehicle Results					
Average Speed, mi/h		68.7	Percent Followers, %		30.2
Segment Travel Time, minutes		0.26	Follower Density (FD), followers/mi/ln		1.0
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		227	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.84	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		799
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		227	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		3.08
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.13
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29347	PF Power Coefficient (p)		0.75789
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	799	-	-	68.1
Vehicle Results					
Average Speed, mi/h		68.1	Percent Followers, %		34.3
Segment Travel Time, minutes		0.13	Follower Density (FD), followers/mi/ln		1.1
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		227	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.84	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 12					

Vehicle Inputs					
Segment Type		Passing Zone		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				857	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		227		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.88		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.13	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
Speed Slope Coefficient (m)		4.28919		Speed Power Coefficient (p)	
PF Slope Coefficient (m)		-1.21919		PF Power Coefficient (p)	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln	
%Improvement to Percent Followers		0.0		%Improvement to Speed	
				0.0	
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	857	-	-	68.7
Vehicle Results					
Average Speed, mi/h		68.7		Percent Followers, %	
Segment Travel Time, minutes		0.14		Follower Density (FD), followers/mi/ln	
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0		Pavement Condition Rating	
Flow Rate Outside Lane, veh/h		227		Bicycle Effective Width, ft	
Bicycle LOS Score		2.84		Bicycle Effective Speed Factor	
Bicycle LOS		C			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Constrained		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				1288	
				60.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		227		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.88		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.13	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
Speed Slope Coefficient (m)		4.57372		Speed Power Coefficient (p)	
PF Slope Coefficient (m)		-1.39671		PF Power Coefficient (p)	
				0.73647	

In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.5
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1288	-	-	58.1

Vehicle Results

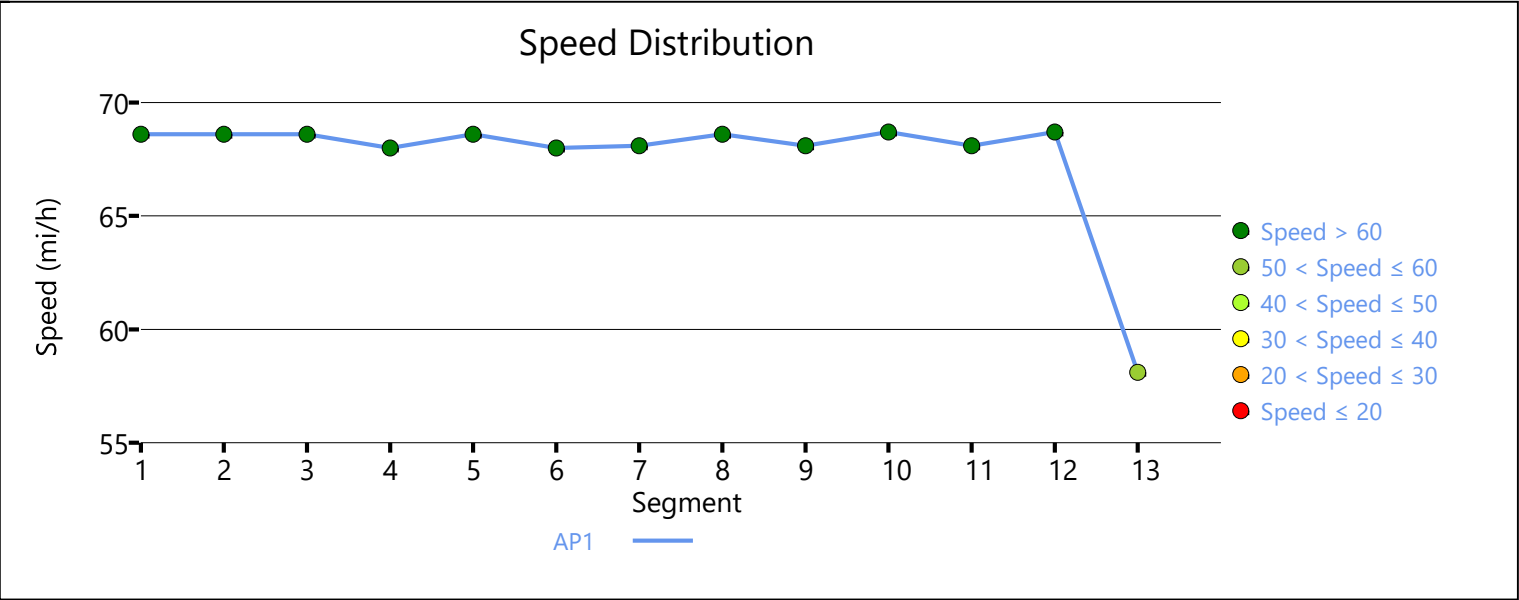
Average Speed, mi/h	58.1	Percent Followers, %	37.4
Segment Travel Time, minutes	0.25	Follower Density (FD), followers/mi/ln	1.5
Vehicle LOS	A		

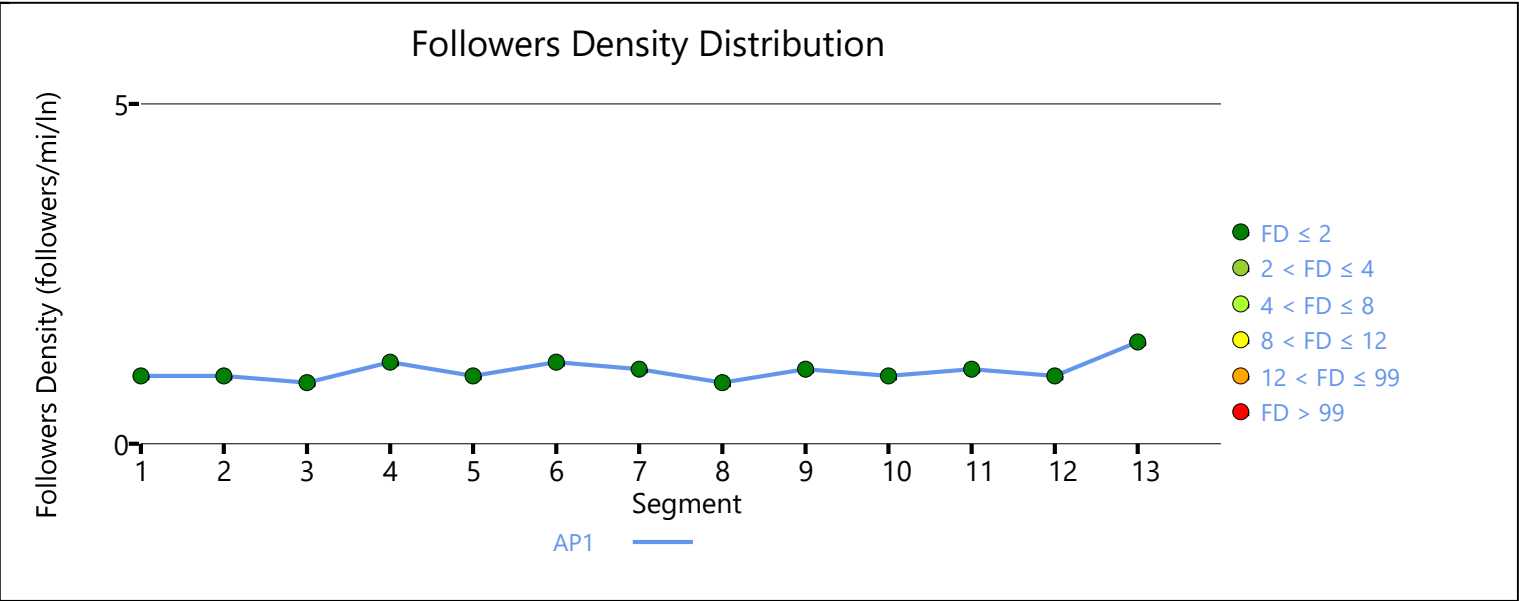
Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	227	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.74	Bicycle Effective Speed Factor	4.79
Bicycle LOS	C		

Facility Results

T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	308	0.10	1.0	A

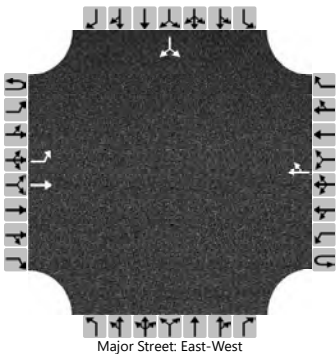




HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD 38 & SD 19
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/8/2023	East/West Street	SD 38
Analysis Year	2050	North/South Street	SD 19
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	0	1	0		0	0	0		0	1	0
Configuration		L	T					TR							LR	
Volume (veh/h)		55	165				120	50						70		95
Percent Heavy Vehicles (%)		30												9		11
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)		4.40												6.49		6.31
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.47												3.58		3.40

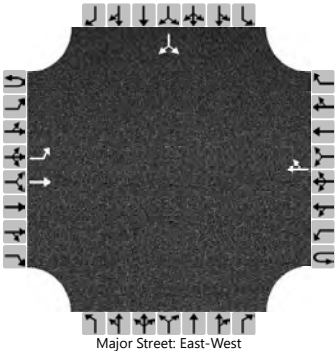
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		60													179	
Capacity, c (veh/h)		1238													677	
v/c Ratio		0.05													0.26	
95% Queue Length, Q ₉₅ (veh)		0.2													1.1	
Control Delay (s/veh)		8.1													12.2	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	2.0												12.2			
Approach LOS	A												B			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD 38 & SD 19
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/8/2023	East/West Street	SD 38
Analysis Year	2050	North/South Street	SD 19
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	0	1	0		0	0	0		0	1	0
Configuration		L	T					TR							LR	
Volume (veh/h)		85	115				170	80						40		50
Percent Heavy Vehicles (%)		2												10		14
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)		4.12												6.50		6.34
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.59		3.43

Delay, Queue Length, and Level of Service

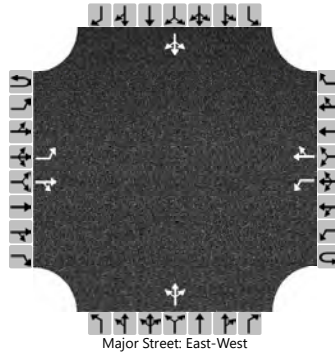
Flow Rate, v (veh/h)		92													98	
Capacity, c (veh/h)		1291													593	
v/c Ratio		0.07													0.16	
95% Queue Length, Q ₉₅ (veh)		0.2													0.6	
Control Delay (s/veh)		8.0													12.3	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	3.4												12.3			
Approach LOS	A												B			

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & 459th
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/8/2023	East/West Street	SD 38
Analysis Year	2050	North/South Street	459th Ave
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		0	215	7		2	155	0		15	0	7		9	0	0
Percent Heavy Vehicles (%)		3				3				13	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.13				4.13				7.23	6.50	6.20		7.10	6.50	6.20
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)		2.23				2.23				3.62	4.00	3.30		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

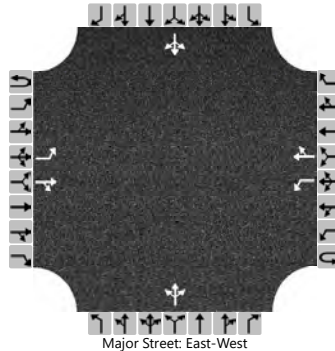
Flow Rate, v (veh/h)		0				2					24				10	
Capacity, c (veh/h)		1403				1319					596				552	
v/c Ratio		0.00				0.00					0.04				0.02	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.1				0.1	
Control Delay (s/veh)		7.6				7.7					11.3				11.6	
Level of Service (LOS)		A				A					B				B	
Approach Delay (s/veh)	0.0				0.1				11.3				11.6			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & 459th
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/8/2023	East/West Street	SD 38
Analysis Year	2050	North/South Street	459th Ave
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		0	145	9		15	245	2		15	0	4		2	2	0
Percent Heavy Vehicles (%)		0				0				13	0	0		0	100	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.10				7.23	6.50	6.20		7.10	7.50	6.20
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)		2.20				2.20				3.62	4.00	3.30		3.50	4.90	3.30

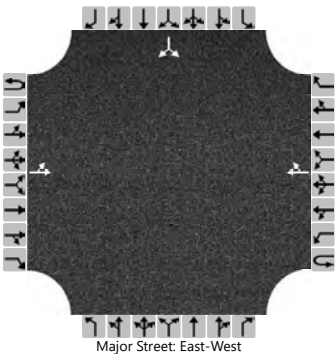
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0				16					21				4	
Capacity, c (veh/h)		1307				1423					534				429	
v/c Ratio		0.00				0.01					0.04				0.01	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.1				0.0	
Control Delay (s/veh)		7.8				7.6					12.0				13.5	
Level of Service (LOS)		A				A					B				B	
Approach Delay (s/veh)	0.0				0.4				12.0				13.5			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD 38 & I-90 Speedway
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/8/2023	East/West Street	SD 38
Analysis Year	2050	North/South Street	I-90 Expressway
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		0	230				165	0						0		0
Percent Heavy Vehicles (%)		3												3		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

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

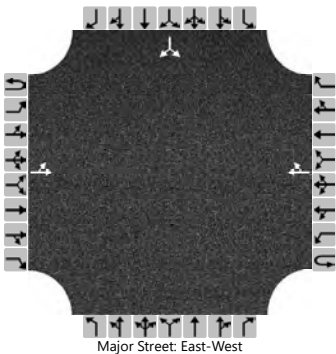
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0													0	
Capacity, c (veh/h)		1390													0	
v/c Ratio		0.00														
95% Queue Length, Q ₉₅ (veh)		0.0														
Control Delay (s/veh)		7.6	0.0													
Level of Service (LOS)		A	A													
Approach Delay (s/veh)	0.0															
Approach LOS	A															

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD 38 & I-90 Speedway
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/8/2023	East/West Street	SD 38
Analysis Year	2050	North/South Street	I-90 Expressway
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		0	165				260	0						0		0
Percent Heavy Vehicles (%)		3												3		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

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

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0													0	
Capacity, c (veh/h)		1274													0	
v/c Ratio		0.00														
95% Queue Length, Q ₉₅ (veh)		0.0														
Control Delay (s/veh)		7.8	0.0													
Level of Service (LOS)		A	A													
Approach Delay (s/veh)	0.0															
Approach LOS	A															

HCS Two-Way Stop-Control Report

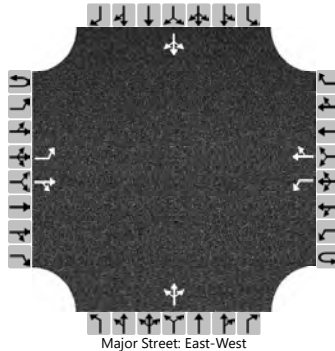
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/8/2023
Analysis Year	2050
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & 463rd Ave / Western Ave
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	463rd Ave / Western Ave
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	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		9	180	80		60	110	30		65	75	90		40	80	5
Percent Heavy Vehicles (%)		3				3				14	2	6		0	7	33
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.13				4.13				7.24	6.52	6.26		7.10	6.57	6.53
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)		2.23				2.23				3.63	4.02	3.35		3.50	4.06	3.60

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		10				65					250				136	
Capacity, c (veh/h)		1422				1274					463				376	
v/c Ratio		0.01				0.05					0.54				0.36	
95% Queue Length, Q ₉₅ (veh)		0.0				0.2					3.2				1.6	
Control Delay (s/veh)		7.5				8.0					21.5				19.9	
Level of Service (LOS)		A				A					C				C	
Approach Delay (s/veh)	0.3				2.4				21.5				19.9			
Approach LOS	A				A				C				C			

HCS Two-Way Stop-Control Report

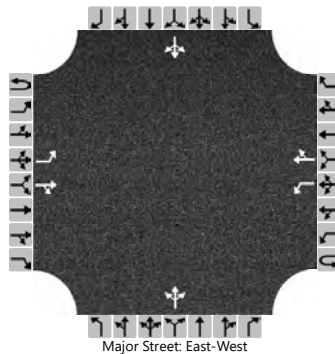
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/8/2023
Analysis Year	2050
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & 463rd Ave / Western Ave
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	463rd Ave / Western Ave
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	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		15	125	55		120	200	60		70	85	155		55	100	25
Percent Heavy Vehicles (%)		22				3				0	11	4		0	4	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.32				4.13				7.10	6.61	6.24		7.10	6.54	6.20
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)		2.40				2.23				3.50	4.10	3.34		3.50	4.04	3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		16				130					337				196	
Capacity, c (veh/h)		1173				1371					378				268	
v/c Ratio		0.01				0.10					0.89				0.73	
95% Queue Length, Q ₉₅ (veh)		0.0				0.3					9.0				5.2	
Control Delay (s/veh)		8.1				7.9					56.5				47.6	
Level of Service (LOS)		A				A					F				E	
Approach Delay (s/veh)	0.6				2.5				56.5				47.6			
Approach LOS	A				A				F				E			

HCS Two-Way Stop-Control Report

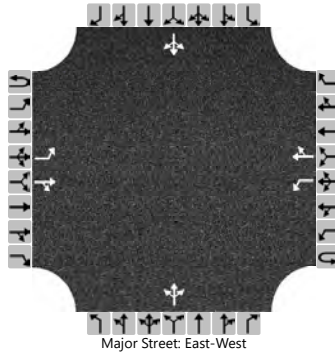
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/8/2023
Analysis Year	2050
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & Main Ave
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	Main Ave (9th St)
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	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		2	260	30		40	195	20		40	5	85		6	10	4
Percent Heavy Vehicles (%)		0				11				5	0	2		0	17	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.21				7.15	6.50	6.22		7.10	6.67	6.20
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)		2.20				2.30				3.55	4.00	3.32		3.50	4.15	3.30

Delay, Queue Length, and Level of Service

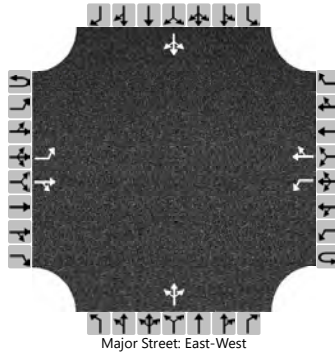
Flow Rate, v (veh/h)		2				43					141				22	
Capacity, c (veh/h)		1346				1196					555				403	
v/c Ratio		0.00				0.04					0.25				0.05	
95% Queue Length, Q ₉₅ (veh)		0.0				0.1					1.0				0.2	
Control Delay (s/veh)		7.7				8.1					13.7				14.4	
Level of Service (LOS)		A				A					B				B	
Approach Delay (s/veh)	0.1				1.3				13.7				14.4			
Approach LOS	A				A				B				B			

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & Main Ave
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/8/2023	East/West Street	SD 38
Analysis Year	2050	North/South Street	Main Ave (9th St)
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	0		0	1	0		0	1	0
Configuration		L		TR		L		TR			LTR				LTR	
Volume (veh/h)		10	250	45		65	335	60		35	20	55		40	30	7
Percent Heavy Vehicles (%)		0				0				5	0	0		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.10				7.15	6.50	6.20		7.10	6.50	6.20
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)		2.20				2.20				3.55	4.00	3.30		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

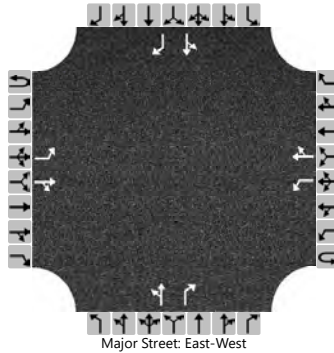
Flow Rate, v (veh/h)		11				71					120				84	
Capacity, c (veh/h)		1141				1251					366				258	
v/c Ratio		0.01				0.06					0.33				0.32	
95% Queue Length, Q ₉₅ (veh)		0.0				0.2					1.4				1.4	
Control Delay (s/veh)		8.2				8.1					19.5				25.5	
Level of Service (LOS)		A				A					C				D	
Approach Delay (s/veh)	0.3				1.1				19.5				25.5			
Approach LOS	A				A				C				D			

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & Vandemark Ave
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/8/2023	East/West Street	SD 38
Analysis Year	2050	North/South Street	Vandemark Avenue
Time Analyzed	AM	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	0		0	1	1		0	1	1
Configuration		L		TR		L		TR		LT		R		LT		R
Volume (veh/h)		25	370	10		8	240	25		9	5	10		40	2	25
Percent Heavy Vehicles (%)		0				0				40	0	0		0	0	7
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized									No				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)		4.10				4.10				7.50	6.50	6.20		7.10	6.50	6.27
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)		2.20				2.20				3.86	4.00	3.30		3.50	4.00	3.36

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		27				9				15		11		46		27
Capacity, c (veh/h)		1286				1157				286		648		310		752
v/c Ratio		0.02				0.01				0.05		0.02		0.15		0.04
95% Queue Length, Q ₉₅ (veh)		0.1				0.0				0.2		0.1		0.5		0.1
Control Delay (s/veh)		7.9				8.1				18.3		10.7		18.6		10.0
Level of Service (LOS)		A				A				C		B		C		A
Approach Delay (s/veh)	0.5				0.2				15.1				15.4			
Approach LOS	A				A				C				C			

HCS Two-Way Stop-Control Report

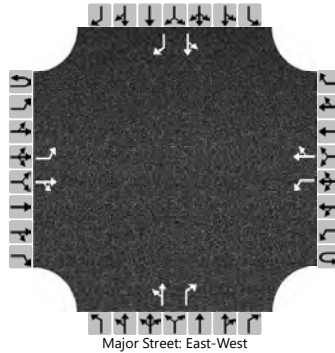
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/8/2023
Analysis Year	2050
Time Analyzed	PM
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & Vandemark Ave
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	Vandemark Avenue
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	0	0	1	1	0		0	1	1		0	1	1
Configuration		L		TR		L		TR		LT		R		LT		R
Volume (veh/h)		20	255	4		5	475	45		0	0	9		30	0	25
Percent Heavy Vehicles (%)		0				0				0	0	100		0	0	7
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized									No				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)		4.10				4.10				7.10	6.50	7.20		7.10	6.50	6.27
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)		2.20				2.20				3.50	4.00	4.20		3.50	4.00	3.36

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		22				5				0		10		33		27
Capacity, c (veh/h)		1017				1293				0		574		262		532
v/c Ratio		0.02				0.00						0.02		0.12		0.05
95% Queue Length, Q ₉₅ (veh)		0.1				0.0						0.1		0.4		0.2
Control Delay (s/veh)		8.6				7.8						11.4		20.7		12.1
Level of Service (LOS)		A				A						B		C		B
Approach Delay (s/veh)	0.6				0.1								16.8			
Approach LOS	A				A								C			

HCS Two-Way Stop-Control Report

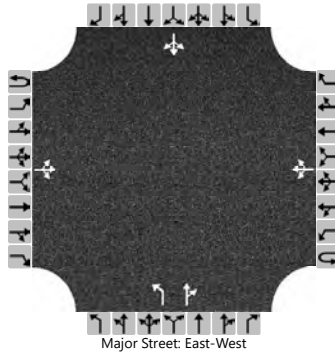
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/8/2023
Analysis Year	2050
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & 2nd St
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	2nd St
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	0	1	0	0	0	1	0		1	1	0		0	1	0
Configuration			LTR				LTR			L		TR			LTR	
Volume (veh/h)		20	325	10		95	200	15		5	20	155		35	50	25
Percent Heavy Vehicles (%)		10				16				33	8	5		0	4	8
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.20				4.26				7.43	6.58	6.25		7.10	6.54	6.28
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)		2.29				2.34				3.80	4.07	3.35		3.50	4.04	3.37

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		22				103				5		190			120	
Capacity, c (veh/h)		1263				1121				169		568			255	
v/c Ratio		0.02				0.09				0.03		0.33			0.47	
95% Queue Length, Q ₉₅ (veh)		0.1				0.3				0.1		1.5			2.3	
Control Delay (s/veh)		7.9	0.2	0.2		8.5	0.9	0.9		27.0		14.5			31.1	
Level of Service (LOS)		A	A	A		A	A	A		D		B			D	
Approach Delay (s/veh)	0.6				3.2				14.8				31.1			
Approach LOS	A				A				B				D			

HCS Two-Way Stop-Control Report

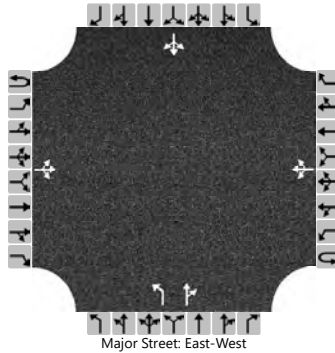
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/8/2023
Analysis Year	2050
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & 2nd St
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	2nd St
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	0	1	0	0	0	1	0		1	1	0		0	1	0
Configuration			LTR				LTR			L		TR			LTR	
Volume (veh/h)		25	235	9		130	490	25		15	25	65		15	30	20
Percent Heavy Vehicles (%)		0				0				0	0	6		0	6	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.10				7.10	6.50	6.26		7.10	6.56	6.20
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)		2.20				2.20				3.50	4.00	3.35		3.50	4.05	3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		27				141				16		98			71	
Capacity, c (veh/h)		1001				1310				114		370			177	
v/c Ratio		0.03				0.11				0.14		0.26			0.40	
95% Queue Length, Q ₉₅ (veh)		0.1				0.4				0.5		1.0			1.8	
Control Delay (s/veh)		8.7	0.3	0.3		8.1	1.3	1.3		41.7		18.2			38.3	
Level of Service (LOS)		A	A	A		A	A	A		E		C			E	
Approach Delay (s/veh)	1.1				2.6				21.6				38.3			
Approach LOS	A				A				C				E			

HCS Two-Way Stop-Control Report

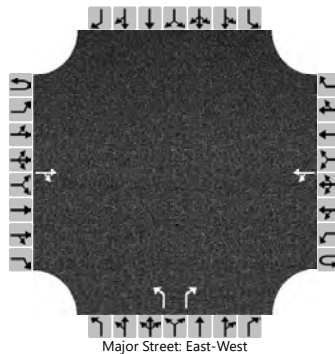
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/8/2023
Analysis Year	2050
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & West Central HS Entrance
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	West Central HS Entrance
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	0	1	0	0	0	1	0		1	0	1		0	0	0
Configuration				TR		LT				L		R				
Volume (veh/h)			425	90		55	285			35		50				
Percent Heavy Vehicles (%)						0				0		0				
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)						4.10				6.40		6.20				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.20				3.50		3.30				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						60				38		54				
Capacity, c (veh/h)						1021				274		567				
v/c Ratio						0.06				0.14		0.10				
95% Queue Length, Q ₉₅ (veh)						0.2				0.5		0.3				
Control Delay (s/veh)						8.7	0.6			20.2		12.0				
Level of Service (LOS)						A	A			C		B				
Approach Delay (s/veh)					1.9				15.4							
Approach LOS					A				C							

HCS Two-Way Stop-Control Report

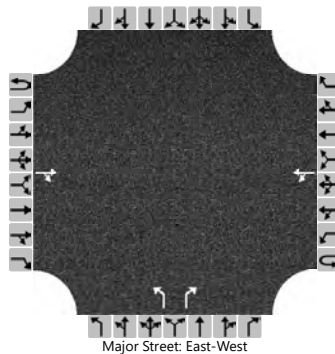
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/8/2023
Analysis Year	2050
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & West Central HS Entrance
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	West Central HS Entrance
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	0	1	0	0	0	1	0		1	0	1		0	0	0
Configuration				TR		LT				L		R				
Volume (veh/h)			305	4		4	620			15		15				
Percent Heavy Vehicles (%)						0				0		0				
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)						4.10				6.40		6.20				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.20				3.50		3.30				

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						4				16		16				
Capacity, c (veh/h)						1235				264		713				
v/c Ratio						0.00				0.06		0.02				
95% Queue Length, Q ₉₅ (veh)						0.0				0.2		0.1				
Control Delay (s/veh)						7.9	0.0			19.5		10.2				
Level of Service (LOS)						A	A			C		B				
Approach Delay (s/veh)					0.1				14.8							
Approach LOS					A				B							

HCS Two-Way Stop-Control Report

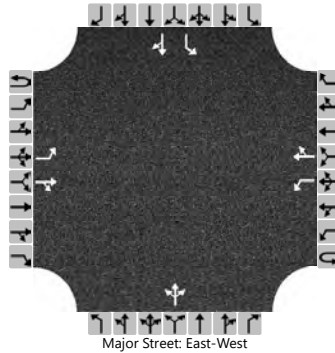
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/8/2023
Analysis Year	2050
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & Railroad Street
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	Railroad St
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	0	0	1	1	0		0	1	0		1	1	0
Configuration		L		TR		L		TR			LTR			L		TR
Volume (veh/h)		4	465	0		15	270	95		2	0	30		145	4	5
Percent Heavy Vehicles (%)		0				0				0	0	15		0	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.10				7.10	6.50	6.35		7.10	6.50	6.20
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)		2.20				2.20				3.50	4.00	3.44		3.50	4.00	3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		4				16					35				158		10
Capacity, c (veh/h)		1173				1070					511				244		419
v/c Ratio		0.00				0.02					0.07				0.65		0.02
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.2				4.0		0.1
Control Delay (s/veh)		8.1				8.4					12.6				43.1		13.8
Level of Service (LOS)		A				A					B				E		B
Approach Delay (s/veh)	0.1				0.3				12.6				41.4				
Approach LOS	A				A				B				E				

HCS Two-Way Stop-Control Report

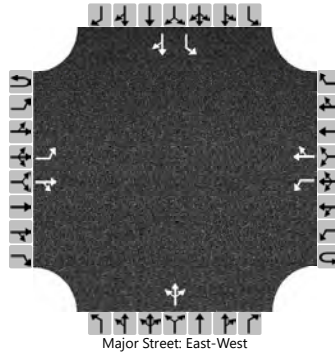
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/8/2023
Analysis Year	2050
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & Railroad Street
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	Railroad St
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	0	0	1	1	0		0	1	0		1	1	0
Configuration		L		TR		L		TR			LTR			L		TR
Volume (veh/h)		4	340	4		15	560	155		2	2	15		85	9	5
Percent Heavy Vehicles (%)		0				40				0	0	15		5	0	0
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.50				7.10	6.50	6.35		7.15	6.50	6.20
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)		2.20				2.56				3.50	4.00	3.44		3.55	4.00	3.30

Delay, Queue Length, and Level of Service

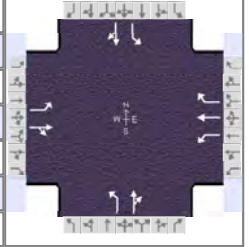
Flow Rate, v (veh/h)		4				16					21				92		15
Capacity, c (veh/h)		848				1004					431				175		256
v/c Ratio		0.01				0.02					0.05				0.53		0.06
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.2				2.7		0.2
Control Delay (s/veh)		9.3				8.6					13.8				46.5		19.9
Level of Service (LOS)		A				A					B				E		C
Approach Delay (s/veh)	0.1				0.2				13.8				42.7				
Approach LOS	A				A				B				E				

HCS Signalized Intersection Results Summary

General Information

Agency	HRG		
Analyst	NM	Analysis Date	May 8, 2023
Jurisdiction	SDDOT	Time Period	AM Peak
Urban Street	SD 38	Analysis Year	2050
Intersection	SD 38 & Mickelson Roa...	File Name	(10) SD38&Mickelson
Project Description			

Intersection Information



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	135	445	35	40	195	190	45	55	65	215	20	195

Signal Information

Cycle, s	70.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On	Green	2.9	2.1	33.1	3.1	2.9	10.0		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	0.0	4.0	4.0	0.0	4.0		
				Red	0.0	0.0	0.0	0.0	0.0	0.0		

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	1.1	4.0
Phase Duration, s	8.9	39.1	6.9	37.1	7.1	14.0	10.0	16.9
Change Period, ($Y+R_c$), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Allow Headway (MAH), s	3.1	0.0	3.1	0.0	3.1	3.3	3.1	3.3
Queue Clearance Time (g_s), s	5.0		2.9		3.7	7.3	8.0	12.3
Green Extension Time (g_e), s	0.2	0.0	0.0	0.0	0.0	0.6	0.0	0.6
Phase Call Probability	0.94		0.57		0.61	1.00	0.99	1.00
Max Out Probability	0.00		0.00		1.00	0.00	1.00	0.01

Movement Group Results

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	147	522		43	212	207	49	130		234	234	
Adjusted Saturation Flow Rate (s), veh/h/ln	1688	1749		1688	1772	1323	1688	1615		1688	1523	
Queue Service Time (g_s), s	3.0	14.8		0.9	5.0	6.8	1.7	5.3		6.0	10.3	
Cycle Queue Clearance Time (g_c), s	3.0	14.8		0.9	5.0	6.8	1.7	5.3		6.0	10.3	
Green Ratio (g/C)	0.54	0.50		0.51	0.47	0.47	0.19	0.14		0.24	0.18	
Capacity (c), veh/h	690	878		402	837	625	187	231		333	282	
Volume-to-Capacity Ratio (X)	0.213	0.594		0.108	0.253	0.330	0.262	0.565		0.702	0.830	
Back of Queue (Q), ft/ln (95 th percentile)												
Back of Queue (Q), veh/ln (95 th percentile)	1.7	9.5		0.5	3.4	3.6	1.2	3.5		2.5	6.7	
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00		0.00	0.00	0.00	0.00	0.00		0.00	0.00	
Uniform Delay (d_1), s/veh	8.2	12.4		10.1	11.1	11.5	24.5	28.0		25.5	27.5	
Incremental Delay (d_2), s/veh	0.1	3.0		0.0	0.7	1.4	0.3	0.8		5.5	2.4	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	8.2	15.3		10.2	11.8	13.0	24.8	28.8		31.1	29.9	
Level of Service (LOS)	A	B		B	B	B	C	C		C	C	
Approach Delay, s/veh / LOS	13.8	B		12.2	B		27.7	C		30.5	C	
Intersection Delay, s/veh / LOS	19.2						B					

Multimodal Results

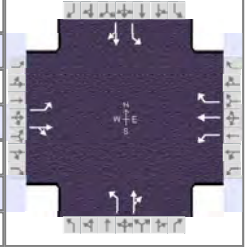
	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	1.88	B		1.89	B		2.12	B		1.92	B	
Bicycle LOS Score / LOS	1.59	B		1.25	A		0.78	A		1.26	A	

HCS Signalized Intersection Results Summary

General Information

Agency	HRG		
Analyst	NM	Analysis Date	May 8, 2023
Jurisdiction	SDDOT	Time Period	AM Peak
Urban Street	SD 38	Analysis Year	2050
Intersection	SD 38 & Mickelson Roa...	File Name	(10) SD38&Mickelson
Project Description			

Intersection Information



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	160	220	20	135	535	225	20	65	10	215	15	185

Signal Information

Cycle, s	70.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On	Green	5.0	0.7	30.8	1.7	1.3	7.0		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.5	0.0	4.0	3.5	3.5	4.0		
				Red	1.0	0.0	1.0	1.0	1.0	1.0		

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	1.1	4.0
Phase Duration, s	10.2	36.5	9.5	35.8	6.2	12.0	12.0	17.8
Change Period, ($Y+R_c$), s	4.5	5.0	4.5	5.0	4.5	5.0	4.5	5.0
Max Allow Headway (MAH), s	3.1	0.0	3.1	0.0	3.1	3.3	3.1	3.3
Queue Clearance Time (g_s), s	5.8		5.3		2.8	5.1	9.5	11.6
Green Extension Time (g_e), s	0.1	0.0	0.1	0.0	0.0	0.3	0.0	0.2
Phase Call Probability	0.97		0.94		0.34	1.00	0.99	1.00
Max Out Probability	1.00		1.00		1.00	0.63	1.00	1.00

Movement Group Results

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	174	261		147	582	245	22	82		234	217	
Adjusted Saturation Flow Rate (s), veh/h/ln	1688	1746		1688	1772	1323	1688	1730		1688	1519	
Queue Service Time (g_s), s	3.8	6.8		3.3	19.2	8.9	0.8	3.1		7.5	9.6	
Cycle Queue Clearance Time (g_c), s	3.8	6.8		3.3	19.2	8.9	0.8	3.1		7.5	9.6	
Green Ratio (g/C)	0.52	0.45		0.51	0.44	0.44	0.12	0.10		0.24	0.18	
Capacity (c), veh/h	379	786		587	779	582	164	173		356	277	
Volume-to-Capacity Ratio (X)	0.459	0.332		0.250	0.746	0.420	0.132	0.472		0.656	0.785	
Back of Queue (Q), ft/ln (95 th percentile)												
Back of Queue (Q), veh/ln (95 th percentile)	2.2	4.6		1.9	12.8	4.8	0.6	2.3		6.3	7.1	
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00		0.00	0.00	0.00	0.00	0.00		0.00	0.00	
Uniform Delay (d_1), s/veh	12.2	12.4		9.7	16.3	13.5	27.4	29.8		24.6	27.3	
Incremental Delay (d_2), s/veh	0.3	1.1		0.1	6.4	2.2	0.1	0.7		3.4	8.9	
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	12.6	13.6		9.8	22.8	15.7	27.6	30.5		28.0	36.2	
Level of Service (LOS)	B	B		A	C	B	C	C		C	D	
Approach Delay, s/veh / LOS	13.2	B		19.0	B		29.9	C		32.0	C	
Intersection Delay, s/veh / LOS	21.3						C					

Multimodal Results

	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.89	B	1.89	B	2.12	B	1.92	B
Bicycle LOS Score / LOS	1.20	A	2.09	B	0.66	A	1.23	A

HCS Two-Way Stop-Control Report

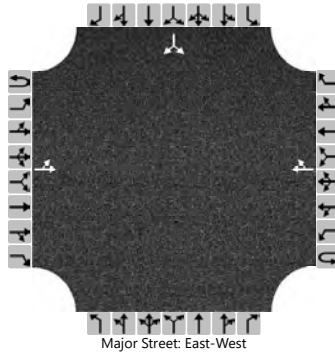
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/8/2023
Analysis Year	2050
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD38 & 466th Ave
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	466th Ave
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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		2	765				430	5						4		0
Percent Heavy Vehicles (%)		0												50		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.10												6.90		6.23
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.95		3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		2													4	
Capacity, c (veh/h)		1100													140	
v/c Ratio		0.00													0.03	
95% Queue Length, Q ₉₅ (veh)		0.0													0.1	
Control Delay (s/veh)		8.3	0.0												31.6	
Level of Service (LOS)		A	A												D	
Approach Delay (s/veh)	0.1												31.6			
Approach LOS	A												D			

HCS Two-Way Stop-Control Report

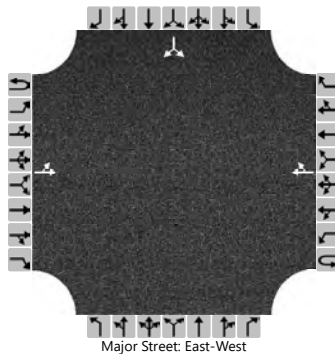
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/8/2023
Analysis Year	2050
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD38 & 466th Ave
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	466th Ave
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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		0	445				910	2						5		2
Percent Heavy Vehicles (%)		0												33		0
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)		4.10												6.73		6.20
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.80		3.30

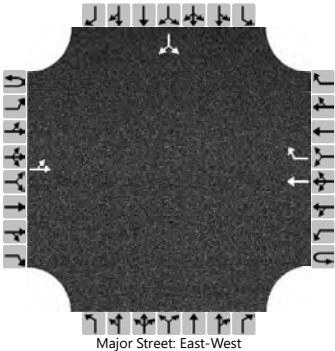
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		0													8	
Capacity, c (veh/h)		705													144	
v/c Ratio		0.00													0.05	
95% Queue Length, Q ₉₅ (veh)		0.0													0.2	
Control Delay (s/veh)		10.1	0.0												31.4	
Level of Service (LOS)		B	A												D	
Approach Delay (s/veh)	0.0												31.4			
Approach LOS	A												D			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD 38 & I-90 WB Terminal
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/8/2023	East/West Street	SD 38
Analysis Year	2050	North/South Street	I-90 WB Terminal
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	1		0	0	0		0	1	0
Configuration		LT					T	R							LR	
Volume (veh/h)		40	730				255	20						15		190
Percent Heavy Vehicles (%)		0												56		12
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)		4.10												6.96		6.32
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												4.00		3.41

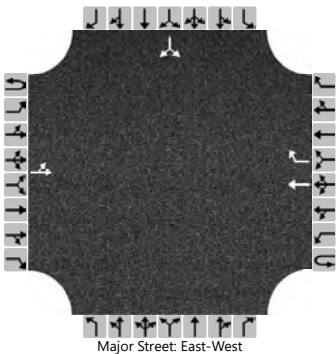
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		43													223	
Capacity, c (veh/h)		1274													584	
v/c Ratio		0.03													0.38	
95% Queue Length, Q ₉₅ (veh)		0.1													1.8	
Control Delay (s/veh)		7.9	0.5												14.9	
Level of Service (LOS)		A	A												B	
Approach Delay (s/veh)	0.9												14.9			
Approach LOS	A												B			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD 38 & I-90 WB Terminal
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/8/2023	East/West Street	SD 38
Analysis Year	2050	North/South Street	I-90 WB Terminal
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	1		0	0	0		0	1	0
Configuration		LT					T	R							LR	
Volume (veh/h)		25	420				415	35						30		495
Percent Heavy Vehicles (%)		0												6		2
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)		4.10												6.46		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.55		3.32

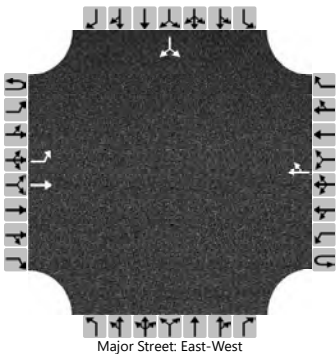
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		27													571	
Capacity, c (veh/h)		1085													568	
v/c Ratio		0.03													1.01	
95% Queue Length, Q ₉₅ (veh)		0.1													14.8	
Control Delay (s/veh)		8.4	0.3												66.1	
Level of Service (LOS)		A	A												F	
Approach Delay (s/veh)	0.7												66.1			
Approach LOS	A												F			

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD 38 & I-90 EB Ramp Terminal
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/8/2023	East/West Street	SD 38
Analysis Year	2050	North/South Street	I-90 EB Ramp Terminal
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	0	1	0		0	0	0		0	1	0
Configuration		L	T					TR							LR	
Volume (veh/h)		430	315				245	20						5		30
Percent Heavy Vehicles (%)		1												33		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.11												6.73		6.23
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.21												3.80		3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		467													38	
Capacity, c (veh/h)		1280													307	
v/c Ratio		0.37													0.12	
95% Queue Length, Q ₉₅ (veh)		1.7													0.4	
Control Delay (s/veh)		9.4													18.4	
Level of Service (LOS)		A													C	
Approach Delay (s/veh)	5.4												18.4			
Approach LOS	A												C			

HCS Two-Way Stop-Control Report

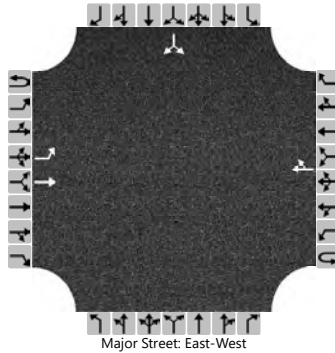
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/8/2023
Analysis Year	2050
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & I-90 EB Ramp Terminal
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	I-90 EB Ramp Terminal
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	0	0	0	1	0		0	0	0		0	1	0
Configuration		L	T					TR							LR	
Volume (veh/h)		190	265				420	30						40		35
Percent Heavy Vehicles (%)		12												36		3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.22												6.76		6.23
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.31												3.82		3.33

Delay, Queue Length, and Level of Service

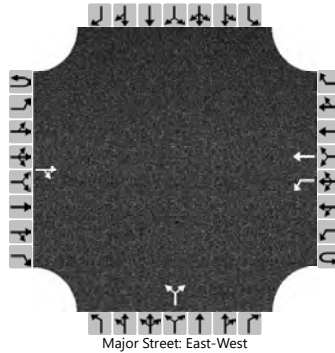
Flow Rate, v (veh/h)		207													82	
Capacity, c (veh/h)		1024													224	
v/c Ratio		0.20													0.36	
95% Queue Length, Q ₉₅ (veh)		0.8													1.6	
Control Delay (s/veh)		9.4													30.0	
Level of Service (LOS)		A													D	
Approach Delay (s/veh)	3.9												30.0			
Approach LOS	A												D			

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & 466th Ave (South)
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/8/2023	East/West Street	SD 38
Analysis Year	2050	North/South Street	466th Ave (South)
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	1	1	0		0	1	0		0	0	0
Configuration				TR		L	T				LR					
Volume (veh/h)			305	20		20	240			25		20				
Percent Heavy Vehicles (%)						20				33		60				
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)						4.30				6.73		6.80				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.38				3.80		3.84				

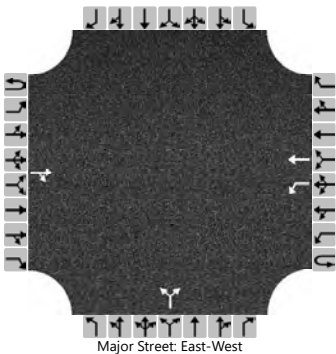
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)					22					49						
Capacity, c (veh/h)					1112					453						
v/c Ratio					0.02					0.11						
95% Queue Length, Q ₉₅ (veh)					0.1					0.4						
Control Delay (s/veh)					8.3					13.9						
Level of Service (LOS)					A					B						
Approach Delay (s/veh)					0.6				13.9							
Approach LOS					A				B							

HCS Two-Way Stop-Control Report

General Information		Site Information	
Analyst	NM	Intersection	SD 38 & 466th Ave (South)
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/8/2023	East/West Street	SD 38
Analysis Year	2050	North/South Street	466th Ave (South)
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	1	1	0		0	1	0		0	0	0
Configuration				TR		L	T				LR					
Volume (veh/h)			280	20		15	405			45		25				
Percent Heavy Vehicles (%)						11				20		0				
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)						4.21				6.60		6.20				
Base Follow-Up Headway (sec)						2.2				3.5		3.3				
Follow-Up Headway (sec)						2.30				3.68		3.30				

Delay, Queue Length, and Level of Service

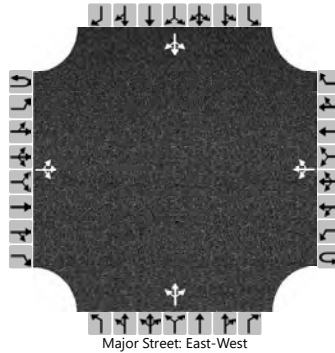
Flow Rate, v (veh/h)					16					76						
Capacity, c (veh/h)					1185					412						
v/c Ratio					0.01					0.18						
95% Queue Length, Q ₉₅ (veh)					0.0					0.7						
Control Delay (s/veh)					8.1					15.7						
Level of Service (LOS)					A					C						
Approach Delay (s/veh)					0.3				15.7							
Approach LOS					A				C							

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & 468th Avenue
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/8/2023	East/West Street	SD 38
Analysis Year	2050	North/South Street	468th Ave / County Highway 141
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		4	360	0		0	225	50		2	2	0		50	0	7
Percent Heavy Vehicles (%)		0				0				0	100	0		4	0	50
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.10				7.10	7.50	6.20		7.14	6.50	6.70
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)		2.20				2.20				3.50	4.90	3.30		3.54	4.00	3.75

Delay, Queue Length, and Level of Service

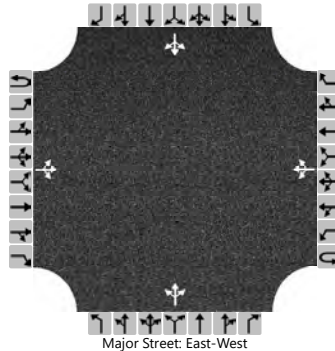
Flow Rate, v (veh/h)		4				0					4				62	
Capacity, c (veh/h)		1274				1178					313				383	
v/c Ratio		0.00				0.00					0.01				0.16	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.0				0.6	
Control Delay (s/veh)		7.8	0.0	0.0		8.1	0.0	0.0			16.7				16.2	
Level of Service (LOS)		A	A	A		A	A	A			C				C	
Approach Delay (s/veh)	0.1				0.0				16.7				16.2			
Approach LOS	A				A				C				C			

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & 468th Avenue
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/8/2023	East/West Street	SD 38
Analysis Year	2050	North/South Street	468th Ave / County Highway 141
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	1	0		0	1	0
Configuration			LTR				LTR				LTR				LTR	
Volume (veh/h)		0	310	2		5	420	55		2	2	0		50	4	4
Percent Heavy Vehicles (%)		0				0				0	0	0		4	100	50
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
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)		4.10				4.10				7.10	6.50	6.20		7.14	7.50	6.70
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)		2.20				2.20				3.50	4.00	3.30		3.54	4.90	3.75

Delay, Queue Length, and Level of Service

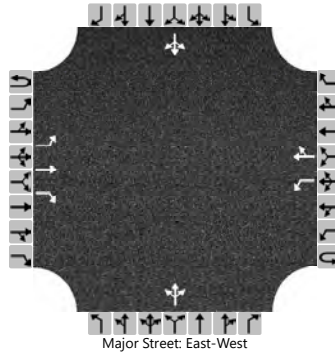
Flow Rate, v (veh/h)		0				5					4				63	
Capacity, c (veh/h)		1060				1231					292				283	
v/c Ratio		0.00				0.00					0.01				0.22	
95% Queue Length, Q ₉₅ (veh)		0.0				0.0					0.0				0.8	
Control Delay (s/veh)		8.4	0.0	0.0		7.9	0.0	0.0			17.5				21.3	
Level of Service (LOS)		A	A	A		A	A	A			C				C	
Approach Delay (s/veh)	0.0				0.1				17.5				21.3			
Approach LOS	A				A				C				C			

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & 469th Ave
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/8/2023	East/West Street	SD 38
Analysis Year	2050	North/South Street	469th Ave / Co Hwy 139
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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)		5	330	75		75	165	5		110	5	280		15	5	5
Percent Heavy Vehicles (%)		3				5				13	3	3		3	3	3
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)		4.13				4.15				7.23	6.53	6.23		7.13	6.53	6.23
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)		2.23				2.25				3.62	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

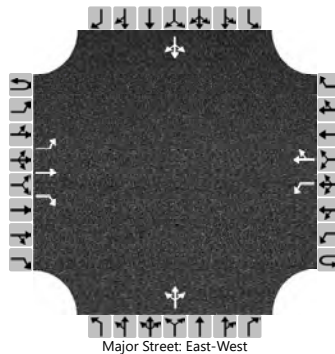
Flow Rate, v (veh/h)		5				82					429				27	
Capacity, c (veh/h)		1384				1104					498				228	
v/c Ratio		0.00				0.07					0.86				0.12	
95% Queue Length, Q ₉₅ (veh)		0.0				0.2					9.1				0.4	
Control Delay (s/veh)		7.6				8.5					42.5				22.9	
Level of Service (LOS)		A				A					E				C	
Approach Delay (s/veh)	0.1				2.6				42.5				22.9			
Approach LOS	A				A				E				C			

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & 469th Ave
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/8/2023	East/West Street	SD 38
Analysis Year	2050	North/South Street	469th Ave / Co Hwy 139
Time Analyzed	PM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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)		5	245	120		285	380	5		100	5	120		20	5	10
Percent Heavy Vehicles (%)		3				5				2	3	15		3	3	3
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)		4.13				4.15				7.12	6.53	6.35		7.13	6.53	6.23
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)		2.23				2.25				3.52	4.03	3.44		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

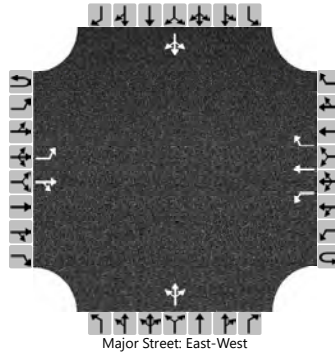
Flow Rate, v (veh/h)		5				310					245				38	
Capacity, c (veh/h)		1135				1146					175				107	
v/c Ratio		0.00				0.27					1.40				0.35	
95% Queue Length, Q ₉₅ (veh)		0.0				1.1					14.9				1.4	
Control Delay (s/veh)		8.2				9.3					259.5				55.9	
Level of Service (LOS)		A				A					F				F	
Approach Delay (s/veh)	0.1				4.0				259.5				55.9			
Approach LOS	A				A				F				F			

HCS Two-Way Stop-Control Report

General Information

Analyst	NM	Intersection	SD 38 & La Mesa
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	5/8/2023	East/West Street	SD 38
Analysis Year	2050	North/South Street	La Mesa
Time Analyzed	AM Peak	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

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	0	0	1	1	1		0	1	0		0	1	0
Configuration		L		TR		L	T	R			LTR				LTR	
Volume (veh/h)		30	700	4		0	235	15		0	15	5		75	4	30
Percent Heavy Vehicles (%)		0				0				0	13	0		0	50	0
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)		4.10				4.10				7.10	6.63	6.20		7.10	7.00	6.20
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)		2.20				2.20				3.50	4.12	3.30		3.50	4.45	3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		33				0					22				118	
Capacity, c (veh/h)		1303				857					227				219	
v/c Ratio		0.03				0.00					0.10				0.54	
95% Queue Length, Q ₉₅ (veh)		0.1				0.0					0.3				2.9	
Control Delay (s/veh)		7.8				9.2					22.5				39.2	
Level of Service (LOS)		A				A					C				E	
Approach Delay (s/veh)	0.3				0.0				22.5				39.2			
Approach LOS	A				A				C				E			

HCS Two-Way Stop-Control Report

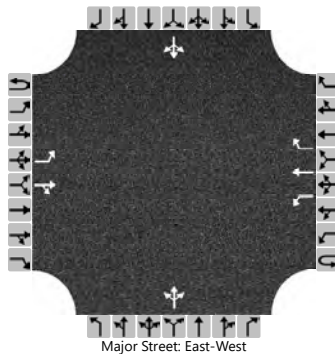
General Information

Analyst	NM
Agency/Co.	HRG
Date Performed	5/8/2023
Analysis Year	2050
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & La Mesa
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	La Mesa
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	0	0	1	1	1		0	1	0		0	1	0
Configuration		L		TR		L	T	R			LTR				LTR	
Volume (veh/h)		25	325	0		9	735	100		4	5	0		80	15	30
Percent Heavy Vehicles (%)		0				0				0	0	0		9	0	0
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)		4.10				4.10				7.10	6.50	6.20		7.19	6.50	6.20
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)		2.20				2.20				3.50	4.00	3.30		3.58	4.00	3.30

Delay, Queue Length, and Level of Service

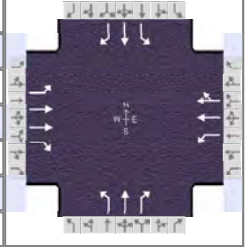
Flow Rate, v (veh/h)		27				10					10				136	
Capacity, c (veh/h)		758				1217					136				168	
v/c Ratio		0.04				0.01					0.07				0.81	
95% Queue Length, Q ₉₅ (veh)		0.1				0.0					0.2				5.4	
Control Delay (s/veh)		9.9				8.0					33.5				81.5	
Level of Service (LOS)		A				A					D				F	
Approach Delay (s/veh)	0.7				0.1				33.5				81.5			
Approach LOS	A				A				D				F			

HCS Signalized Intersection Results Summary

General Information

Agency	HRG		
Analyst	NM	Analysis Date	May 8, 2023
Jurisdiction	SDDOT	Time Period	AM Peak
Urban Street	SD 38	Analysis Year	2050
Intersection	SD 38 & Marion Street	File Name	(18) SD38&Marion
Project Description			

Intersection Information



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	165	340	105	50	125	75	110	225	120	45	145	40

Signal Information

Cycle, s	50.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On	Green	2.6	3.9	12.9	2.5	2.0	10.0		
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	0.0	4.0	4.0	0.0	4.0		
				Red	0.0	0.0	0.0	0.0	0.0	0.0		

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	2.0	3.0	1.1	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	10.6	20.8	6.6	16.9	8.5	16.0	6.5	14.0
Change Period, ($Y+R_c$), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Allow Headway (MAH), s	2.9	0.0	2.9	0.0	2.9	2.9	2.9	2.9
Queue Clearance Time (g_s), s	7.1		3.1		5.6	8.5	3.5	5.9
Green Extension Time (g_e), s	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.6
Phase Call Probability	0.92		0.53		0.81	1.00	0.49	1.00
Max Out Probability	1.00		0.04		1.00	0.21	1.00	0.15

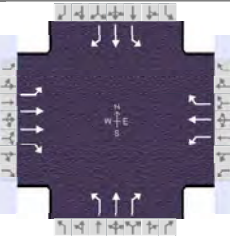
Movement Group Results

Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	179	370	114	54	112	106	120	245	130	49	158	43
Adjusted Saturation Flow Rate (s), veh/h/ln	1701	1674	1525	1714	1772	1556	1647	1674	1502	1554	1758	1466
Queue Service Time (g_s), s	5.1	4.1	2.7	1.1	2.5	2.7	3.6	6.5	3.6	1.5	3.9	1.2
Cycle Queue Clearance Time (g_c), s	5.1	4.1	2.7	1.1	2.5	2.7	3.6	6.5	3.6	1.5	3.9	1.2
Green Ratio (g/C)	0.13	0.34	0.34	0.31	0.26	0.26	0.09	0.24	0.24	0.05	0.20	0.20
Capacity (c), veh/h	223	1128	514	456	459	403	148	403	361	77	352	293
Volume-to-Capacity Ratio (X)	0.804	0.328	0.222	0.119	0.243	0.263	0.806	0.607	0.361	0.638	0.448	0.148
Back of Queue (Q), ft/ln (95 th percentile)												
Back of Queue (Q), veh/ln (95 th percentile)	4.1	2.2	1.4	0.6	1.6	1.6	3.2	3.5	1.7	1.0	2.3	0.6
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	21.1	12.4	11.9	12.3	14.7	14.7	22.3	16.9	15.8	23.3	17.6	16.5
Incremental Delay (d_2), s/veh	11.0	0.8	1.0	0.0	1.3	1.6	15.9	0.8	0.2	3.3	0.3	0.1
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	32.1	13.1	12.9	12.3	15.9	16.3	38.2	17.7	16.0	26.6	17.9	16.6
Level of Service (LOS)	C	B	B	B	B	B	D	B	B	C	B	B
Approach Delay, s/veh / LOS	18.2	B		15.4	B		22.2	C		19.4	B	
Intersection Delay, s/veh / LOS	19.1						B					

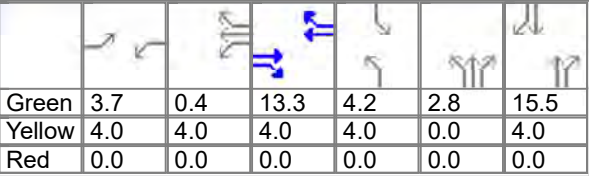

Multimodal Results

	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	2.08	B		2.09	B		2.26	B		2.42	B	
Bicycle LOS Score / LOS	1.03	A		0.71	A		1.30	A		0.90	A	

HCS Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	HRG			Duration, h	0.250	
Analyst	NM	Analysis Date	May 8, 2023	Area Type	Other	
Jurisdiction	SDDOT	Time Period	PM Peak	PHF	0.90	
Urban Street	SD 38	Analysis Year	2050	Analysis Period	1> 16:45	
Intersection	SD 38 & Marion Street	File Name	(18) SD38&Marion_PM.xus			
Project Description						

Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	70	230	105	170	355	55	180	205	125	85	355	205

Signal Information											
Cycle, s	60.0	Reference Phase	2		3.7	0.4	13.3	4.2	2.8	15.5	
Offset, s	0	Reference Point	End								
Uncoordinated	No	Simult. Gap E/W	On								
Force Mode	Fixed	Simult. Gap N/S	On								
Green											
Yellow											
Red											

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0
Phase Duration, s	7.7	17.3	12.2	21.7	11.0	22.3	8.2	19.5
Change Period, ($Y+R_c$), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Allow Headway (MAH), s	2.9	0.0	2.9	0.0	2.9	3.0	2.9	3.0
Queue Clearance Time (g_s), s	5.1		8.5		9.0	8.1	5.3	14.7
Green Extension Time (g_e), s	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.8
Phase Call Probability	0.73		0.96		0.96	1.00	0.79	1.00
Max Out Probability	0.55		1.00		1.00	0.03	1.00	0.89

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	78	256	117	189	394	61	200	228	139	94	394	228
Adjusted Saturation Flow Rate (s), veh/h/ln	1474	1660	1490	1688	1772	1406	1714	1772	1478	1688	1772	1478
Queue Service Time (g_s), s	3.1	3.9	4.0	6.5	12.1	1.9	7.0	6.1	4.3	3.3	12.7	8.1
Cycle Queue Clearance Time (g_c), s	3.1	3.9	4.0	6.5	12.1	1.9	7.0	6.1	4.3	3.3	12.7	8.1
Green Ratio (g/C)	0.06	0.22	0.22	0.14	0.30	0.30	0.12	0.31	0.31	0.07	0.26	0.26
Capacity (c), veh/h	92	735	330	230	523	415	200	541	451	119	459	383
Volume-to-Capacity Ratio (X)	0.845	0.347	0.354	0.822	0.754	0.147	1.000	0.421	0.308	0.797	0.859	0.595
Back of Queue (Q), ft/ln (95 th percentile)												
Back of Queue (Q), veh/ln (95 th percentile)	2.1	2.5	2.5	6.1	9.1	1.0	10.0	3.6	2.1	2.7	9.5	4.2
Queue Storage Ratio (RQ) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	27.8	19.7	19.7	25.2	19.2	15.6	26.5	16.6	16.0	27.5	21.2	19.5
Incremental Delay (d_2), s/veh	7.7	1.3	3.0	18.3	9.7	0.7	63.6	0.2	0.1	10.2	10.8	0.7
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	35.6	21.0	22.7	43.5	28.9	16.3	90.1	16.8	16.1	37.7	31.9	20.2
Level of Service (LOS)	D	C	C	D	C	B	F	B	B	D	C	C
Approach Delay, s/veh / LOS	23.9	C		32.0	C		42.5	D		29.0	C	
Intersection Delay, s/veh / LOS	32.1						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.10	B	2.10	B	2.26	B	2.27	B
Bicycle LOS Score / LOS	0.86	A	1.55	B	1.42	A	1.67	B

HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	5/11/2023
Agency	HRG	Analysis Year	2050 NB
Jurisdiction	SDDOT	Time Analyzed	AM PEAK
Project Description	EB SD38 Corridor Study	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1084
Measured FFS	Measured	Free-Flow Speed, mi/h	55.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	585	Opposing Demand Flow Rate, veh/h	350
Peak Hour Factor	0.88	Total Trucks, %	2.16
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.34

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.0
Speed Slope Coefficient (m)	4.36618	Speed Power Coefficient (p)	0.50547
PF Slope Coefficient (m)	-1.35882	PF Power Coefficient (p)	0.76024
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	6.7
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1084	-	-	52.0

Vehicle Results

Average Speed, mi/h	52.0	Percent Followers, %	59.5
Segment Travel Time, minutes	0.24	Follower Density (FD), followers/mi/ln	6.7
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	585	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.94	Bicycle Effective Speed Factor	4.62
Bicycle LOS	C		

Segment 2

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	507
Measured FFS	Measured	Free-Flow Speed, mi/h	55.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		585	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.16
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.34
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		55.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.43973	PF Power Coefficient (p)		0.72475
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		7.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	507	-	-	51.6
Vehicle Results					
Average Speed, mi/h		51.6	Percent Followers, %		62.3
Segment Travel Time, minutes		0.11	Follower Density (FD), followers/mi/ln		7.1
Vehicle LOS		C			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		585	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.94	Bicycle Effective Speed Factor		4.62
Bicycle LOS		C			
Segment 3					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		535
Measured FFS		Measured	Free-Flow Speed, mi/h		55.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		585	Opposing Demand Flow Rate, veh/h		350
Peak Hour Factor		0.88	Total Trucks, %		2.16
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.34
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		55.0
Speed Slope Coefficient (m)		4.36618	Speed Power Coefficient (p)		0.50547
PF Slope Coefficient (m)		-1.35882	PF Power Coefficient (p)		0.76024
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		6.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	535	-	-	52.0

Vehicle Results

Average Speed, mi/h	52.0	Percent Followers, %	59.5
Segment Travel Time, minutes	0.12	Follower Density (FD), followers/mi/ln	6.7
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	585	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.94	Bicycle Effective Speed Factor	4.62
Bicycle LOS	C		

Segment 4

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1494
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	816	Opposing Demand Flow Rate, veh/h	434
Peak Hour Factor	0.88	Total Trucks, %	1.63
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.48

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.39151	Speed Power Coefficient (p)	0.49146
PF Slope Coefficient (m)	-1.26499	PF Power Coefficient (p)	0.79656
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	8.1
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1494	-	-	66.3

Vehicle Results

Average Speed, mi/h	66.3	Percent Followers, %	65.9
Segment Travel Time, minutes	0.26	Follower Density (FD), followers/mi/ln	8.1
Vehicle LOS	D		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	816	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.11	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		5762
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		816	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		1.63
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.48
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.62977	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.20069	PF Power Coefficient (p)		0.78591
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		7.9
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5762	-	-	66.0
Vehicle Results					
Average Speed, mi/h		66.0	Percent Followers, %		64.1
Segment Travel Time, minutes		0.99	Follower Density (FD), followers/mi/ln		7.9
Vehicle LOS		C			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		816	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.11	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		383
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		816	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		1.89
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.48
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29361	PF Power Coefficient (p)	0.75772
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	8.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	383	-	-	66.0

Vehicle Results			
Average Speed, mi/h	66.0	Percent Followers, %	67.0
Segment Travel Time, minutes	0.07	Follower Density (FD), followers/mi/ln	8.3
Vehicle LOS	D		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	816	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.17	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 7

Vehicle Inputs			
Segment Type	Passing Constrained	Length, ft	1485
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	883	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	3.19
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.52

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57684	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.28453	PF Power Coefficient (p)	0.76145
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	9.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1485	-	-	65.9

Vehicle Results			
Average Speed, mi/h	65.9	Percent Followers, %	68.9
Segment Travel Time, minutes	0.26	Follower Density (FD), followers/mi/ln	9.2
Vehicle LOS	D		

Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		883	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.56	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 8					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		426
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		430	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		6.47
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.25
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29307	PF Power Coefficient (p)		0.75839
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		3.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	426	-	-	67.1
Vehicle Results					
Average Speed, mi/h		67.1	Percent Followers, %		49.4
Segment Travel Time, minutes		0.07	Follower Density (FD), followers/mi/ln		3.2
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		430	Bicycle Effective Width, ft		24
Bicycle LOS Score		4.23	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 9					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1212
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					

Directional Demand Flow Rate, veh/h		360	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.21
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29321	PF Power Coefficient (p)		0.75821
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1212	-	-	67.4
Vehicle Results					
Average Speed, mi/h		67.4	Percent Followers, %		44.9
Segment Travel Time, minutes		0.20	Follower Density (FD), followers/mi/ln		2.4
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		360	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.73	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1877
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		360	Opposing Demand Flow Rate, veh/h		263
Peak Hour Factor		0.88	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.21
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.35010	Speed Power Coefficient (p)		0.52339
PF Slope Coefficient (m)		-1.22503	PF Power Coefficient (p)		0.81368
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	1877	-	-	67.8
Vehicle Results					
Average Speed, mi/h		67.8	Percent Followers, %		41.4
Segment Travel Time, minutes		0.31	Follower Density (FD), followers/mi/ln		2.2
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		360	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.73	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1872
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		360	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.21
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.58354	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.26676	PF Power Coefficient (p)		0.76864
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1872	-	-	67.4
Vehicle Results					
Average Speed, mi/h		67.4	Percent Followers, %		43.9
Segment Travel Time, minutes		0.32	Follower Density (FD), followers/mi/ln		2.3
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		360	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.73	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 12					

Vehicle Inputs					
Segment Type		Passing Zone		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				3603	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		360		Opposing Demand Flow Rate, veh/h	
				263	
Peak Hour Factor		0.88		Total Trucks, %	
				5.26	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.21	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
				70.0	
Speed Slope Coefficient (m)		4.37375		Speed Power Coefficient (p)	
				0.52339	
PF Slope Coefficient (m)		-1.18124		PF Power Coefficient (p)	
				0.83047	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln	
				2.1	
%Improvement to Percent Followers		0.0		%Improvement to Speed	
				0.0	
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3603	-	-	67.8
Vehicle Results					
Average Speed, mi/h		67.8		Percent Followers, %	
				39.7	
Segment Travel Time, minutes		0.60		Follower Density (FD), followers/mi/ln	
				2.1	
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0		Pavement Condition Rating	
				4	
Flow Rate Outside Lane, veh/h		360		Bicycle Effective Width, ft	
				24	
Bicycle LOS Score		3.73		Bicycle Effective Speed Factor	
				5.07	
Bicycle LOS		D			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Constrained		Length, ft	
				1053	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		360		Opposing Demand Flow Rate, veh/h	
				-	
Peak Hour Factor		0.88		Total Trucks, %	
				5.26	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.21	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
				70.0	
Speed Slope Coefficient (m)		4.57372		Speed Power Coefficient (p)	
				0.41674	
PF Slope Coefficient (m)		-1.29321		PF Power Coefficient (p)	
				0.75821	

In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1053	-	-	67.4
Vehicle Results					
Average Speed, mi/h		67.4	Percent Followers, %		44.9
Segment Travel Time, minutes		0.18	Follower Density (FD), followers/mi/ln		2.4
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		360	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.73	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 14					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1120
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		360	Opposing Demand Flow Rate, veh/h		263
Peak Hour Factor		0.88	Total Trucks, %		5.26
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.21
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.34020	Speed Power Coefficient (p)		0.52339
PF Slope Coefficient (m)		-1.25077	PF Power Coefficient (p)		0.80264
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1120	-	-	67.9
Vehicle Results					
Average Speed, mi/h	67.9	Percent Followers, %	42.4		
Segment Travel Time, minutes	0.19	Follower Density (FD), followers/mi/ln	2.2		
Vehicle LOS	B				
Bicycle Results					
Percent Occupied Parking	0	Pavement Condition Rating	4		

Flow Rate Outside Lane, veh/h	360	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.73	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 15

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1272
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	456	Opposing Demand Flow Rate, veh/h	306
Peak Hour Factor	0.88	Total Trucks, %	5.09
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.27

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.35349	Speed Power Coefficient (p)	0.51403
PF Slope Coefficient (m)	-1.25787	PF Power Coefficient (p)	0.80000
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1272	-	-	67.4

Vehicle Results

Average Speed, mi/h	67.4	Percent Followers, %	48.9
Segment Travel Time, minutes	0.21	Follower Density (FD), followers/mi/ln	3.3
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	456	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.79	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 16

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	625
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	456	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	5.09
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.27

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29323	PF Power Coefficient (p)	0.75819
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.5
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	625	-	-	67.0

Vehicle Results			
Average Speed, mi/h	67.0	Percent Followers, %	51.0
Segment Travel Time, minutes	0.11	Follower Density (FD), followers/mi/ln	3.5
Vehicle LOS	B		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	456	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.79	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 17

Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	1995
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	456	Opposing Demand Flow Rate, veh/h	306
Peak Hour Factor	0.88	Total Trucks, %	5.09
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.27

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.36529	Speed Power Coefficient (p)	0.51403
PF Slope Coefficient (m)	-1.22751	PF Power Coefficient (p)	0.81278
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1995	-	-	67.4

Vehicle Results			
Average Speed, mi/h	67.4	Percent Followers, %	47.7

Segment Travel Time, minutes		0.34	Follower Density (FD), followers/mi/ln		3.2
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		456	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.79	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 18					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1399
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		456	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		5.09
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.27
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57524	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.28884	PF Power Coefficient (p)		0.75993
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		3.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1399	-	-	67.0
Vehicle Results					
Average Speed, mi/h		67.0	Percent Followers, %		50.8
Segment Travel Time, minutes		0.24	Follower Density (FD), followers/mi/ln		3.5
Vehicle LOS		B			

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	456	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.79	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		
Segment 19			
Vehicle Inputs			
Segment Type	Passing Constrained	Length, ft	1254
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		811	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		1.51
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.48
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29366	PF Power Coefficient (p)		0.75766
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		8.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1254	-	-	66.0
Vehicle Results					
Average Speed, mi/h		66.0	Percent Followers, %		66.9
Segment Travel Time, minutes		0.22	Follower Density (FD), followers/mi/ln		8.2
Vehicle LOS		D			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		811	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.07	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 20					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1108
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		811	Opposing Demand Flow Rate, veh/h		280
Peak Hour Factor		0.88	Total Trucks, %		1.51
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.48
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.34556	Speed Power Coefficient (p)		0.51956
PF Slope Coefficient (m)		-1.25412	PF Power Coefficient (p)		0.80102
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		8.0
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1108	-	-	66.4

Vehicle Results

Average Speed, mi/h	66.4	Percent Followers, %	65.4
Segment Travel Time, minutes	0.19	Follower Density (FD), followers/mi/ln	8.0
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	811	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.07	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 21

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	2901
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	811	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	1.51
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.48

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.59854	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.23554	PF Power Coefficient (p)	0.77974
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	8.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2901	-	-	66.0

Vehicle Results

Average Speed, mi/h	66.0	Percent Followers, %	65.0
Segment Travel Time, minutes	0.50	Follower Density (FD), followers/mi/ln	8.0
Vehicle LOS	C		

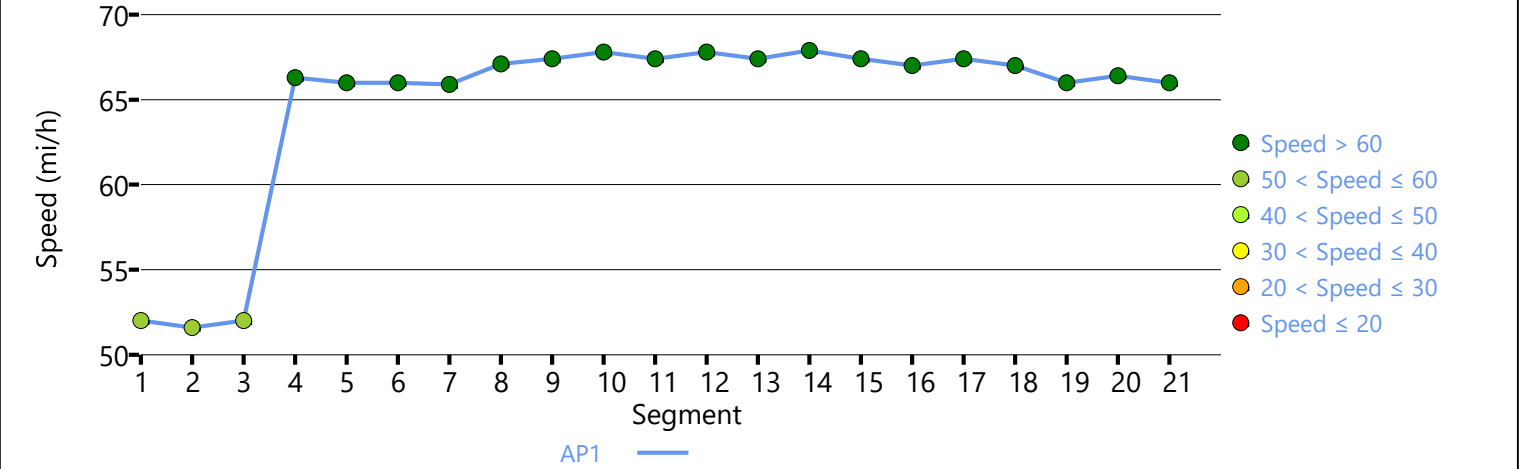
Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	811	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.07	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

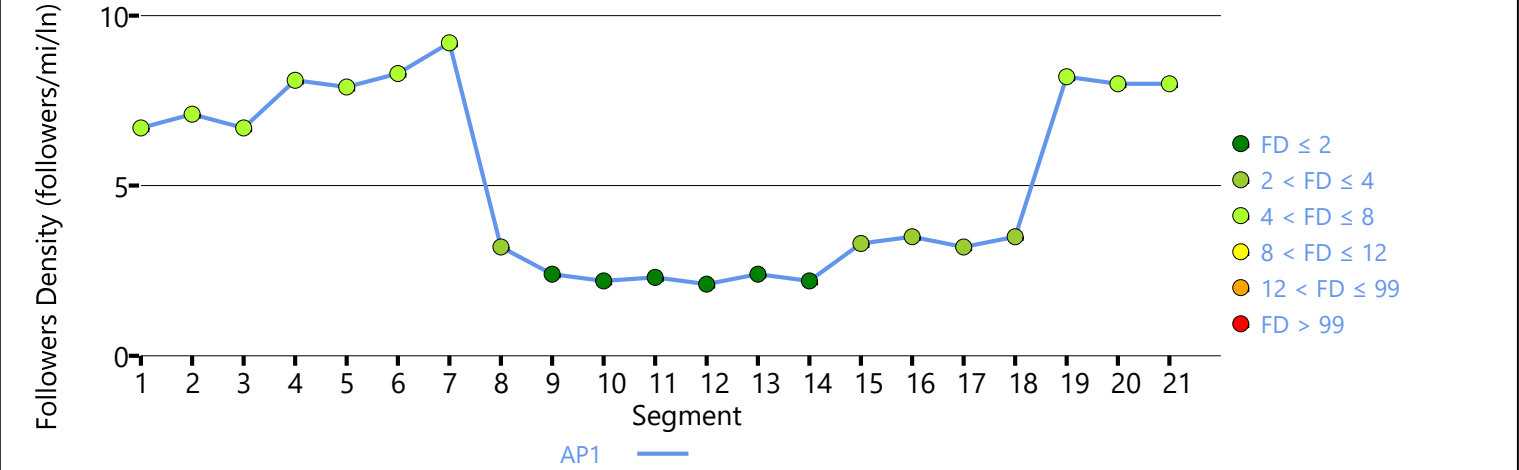
Facility Results

T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	813	0.62	5.3	C

Speed Distribution



Followers Density Distribution



HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	5/11/2023
Agency	HRG	Analysis Year	2050 NB
Jurisdiction	SDDOT	Time Analyzed	PM PEAK
Project Description	EB SD38 Corridor Study	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1084
Measured FFS	Measured	Free-Flow Speed, mi/h	55.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	368	Opposing Demand Flow Rate, veh/h	674
Peak Hour Factor	0.88	Total Trucks, %	2.16
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.22

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.0
Speed Slope Coefficient (m)	4.44134	Speed Power Coefficient (p)	0.46217
PF Slope Coefficient (m)	-1.40189	PF Power Coefficient (p)	0.74782
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.4
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1084	-	-	52.6

Vehicle Results

Average Speed, mi/h	52.6	Percent Followers, %	48.5
Segment Travel Time, minutes	0.23	Follower Density (FD), followers/mi/ln	3.4
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	368	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.70	Bicycle Effective Speed Factor	4.62
Bicycle LOS	C		

Segment 2

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1014
Measured FFS	Measured	Free-Flow Speed, mi/h	55.0

Demand and Capacity							
Directional Demand Flow Rate, veh/h		368		Opposing Demand Flow Rate, veh/h		-	
Peak Hour Factor		0.88		Total Trucks, %		2.16	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.22	
Intermediate Results							
Segment Vertical Class		1		Free-Flow Speed, mi/h		55.0	
Speed Slope Coefficient (m)		4.57372		Speed Power Coefficient (p)		0.41674	
PF Slope Coefficient (m)		-1.43973		PF Power Coefficient (p)		0.72475	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		3.5	
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0	
Subsegment Data							
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h		
1	Tangent	507	-	-	52.4		
2	Horizontal Curve	507	3000	0.0	52.4		
Vehicle Results							
Average Speed, mi/h		52.4		Percent Followers, %		50.2	
Segment Travel Time, minutes		0.22		Follower Density (FD), followers/mi/ln		3.5	
Vehicle LOS		B					
Bicycle Results							
Percent Occupied Parking		0		Pavement Condition Rating		4	
Flow Rate Outside Lane, veh/h		368		Bicycle Effective Width, ft		24	
Bicycle LOS Score		2.70		Bicycle Effective Speed Factor		4.62	
Bicycle LOS		C					
Segment 3							
Vehicle Inputs							
Segment Type		Passing Zone		Length, ft		535	
Measured FFS		Measured		Free-Flow Speed, mi/h		55.0	
Demand and Capacity							
Directional Demand Flow Rate, veh/h		368		Opposing Demand Flow Rate, veh/h		674	
Peak Hour Factor		0.88		Total Trucks, %		2.16	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.22	
Intermediate Results							
Segment Vertical Class		1		Free-Flow Speed, mi/h		55.0	
Speed Slope Coefficient (m)		4.44134		Speed Power Coefficient (p)		0.46217	
PF Slope Coefficient (m)		-1.40189		PF Power Coefficient (p)		0.74782	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		3.4	
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0	

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	535	-	-	52.6

Vehicle Results			
Average Speed, mi/h	52.6	Percent Followers, %	48.5
Segment Travel Time, minutes	0.12	Follower Density (FD), followers/mi/ln	3.4
Vehicle LOS	B		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	368	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.70	Bicycle Effective Speed Factor	4.62
Bicycle LOS	C		

Segment 4			
Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	1494
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	445	Opposing Demand Flow Rate, veh/h	986
Peak Hour Factor	0.88	Total Trucks, %	1.63
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.26

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.50109	Speed Power Coefficient (p)	0.43798
PF Slope Coefficient (m)	-1.28998	PF Power Coefficient (p)	0.77572
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1494	-	-	67.2

Vehicle Results			
Average Speed, mi/h	67.2	Percent Followers, %	49.8
Segment Travel Time, minutes	0.25	Follower Density (FD), followers/mi/ln	3.3
Vehicle LOS	B		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	445	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.80	Bicycle Effective Speed Factor	5.07

Bicycle LOS		C			
Segment 5					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		5762
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		445	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		1.63
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.26
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.62977	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.20069	PF Power Coefficient (p)		0.78591
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		3.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5762	-	-	67.0
Vehicle Results					
Average Speed, mi/h		67.0	Percent Followers, %		47.1
Segment Travel Time, minutes		0.98	Follower Density (FD), followers/mi/ln		3.1
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		445	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.80	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		383
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		453	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		1.89
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.27
Intermediate Results					

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29361	PF Power Coefficient (p)	0.75772
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.4
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	383	-	-	67.0

Vehicle Results

Average Speed, mi/h	67.0	Percent Followers, %	50.9
Segment Travel Time, minutes	0.06	Follower Density (FD), followers/mi/ln	3.4
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	453	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.87	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 7

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1485
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	522	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	3.19
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.31

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57684	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.28453	PF Power Coefficient (p)	0.76145
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1485	-	-	66.8

Vehicle Results

Average Speed, mi/h	66.8	Percent Followers, %	54.3
Segment Travel Time, minutes	0.25	Follower Density (FD), followers/mi/ln	4.2

Vehicle LOS		C			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating	4	
Flow Rate Outside Lane, veh/h		522	Bicycle Effective Width, ft	24	
Bicycle LOS Score		3.29	Bicycle Effective Speed Factor	5.07	
Bicycle LOS		C			
Segment 8					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft	426	
Measured FFS		Measured	Free-Flow Speed, mi/h	70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		407	Opposing Demand Flow Rate, veh/h	-	
Peak Hour Factor		0.88	Total Trucks, %	6.47	
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)	0.24	
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h	70.0	
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)	0.41674	
PF Slope Coefficient (m)		-1.29307	PF Power Coefficient (p)	0.75839	
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln	2.9	
%Improvement to Percent Followers		0.0	%Improvement to Speed	0.0	
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	426	-	-	67.2
Vehicle Results					
Average Speed, mi/h		67.2	Percent Followers, %	48.0	
Segment Travel Time, minutes		0.07	Follower Density (FD), followers/mi/ln	2.9	
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating	4	
Flow Rate Outside Lane, veh/h		407	Bicycle Effective Width, ft	24	
Bicycle LOS Score		4.20	Bicycle Effective Speed Factor	5.07	
Bicycle LOS		D			
Segment 9					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft	1212	
Measured FFS		Measured	Free-Flow Speed, mi/h	70.0	

Demand and Capacity							
Directional Demand Flow Rate, veh/h		314		Opposing Demand Flow Rate, veh/h		-	
Peak Hour Factor		0.88		Total Trucks, %		5.26	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.18	
Intermediate Results							
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0	
Speed Slope Coefficient (m)		4.57372		Speed Power Coefficient (p)		0.41674	
PF Slope Coefficient (m)		-1.29321		PF Power Coefficient (p)		0.75821	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		1.9	
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0	
Subsegment Data							
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h		
1	Tangent	1212	-	-	67.6		
Vehicle Results							
Average Speed, mi/h		67.6		Percent Followers, %		41.5	
Segment Travel Time, minutes		0.20		Follower Density (FD), followers/mi/ln		1.9	
Vehicle LOS		A					
Bicycle Results							
Percent Occupied Parking		0		Pavement Condition Rating		4	
Flow Rate Outside Lane, veh/h		314		Bicycle Effective Width, ft		24	
Bicycle LOS Score		3.66		Bicycle Effective Speed Factor		5.07	
Bicycle LOS		D					
Segment 10							
Vehicle Inputs							
Segment Type		Passing Zone		Length, ft		1877	
Measured FFS		Measured		Free-Flow Speed, mi/h		70.0	
Demand and Capacity							
Directional Demand Flow Rate, veh/h		314		Opposing Demand Flow Rate, veh/h		430	
Peak Hour Factor		0.88		Total Trucks, %		5.26	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.18	
Intermediate Results							
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0	
Speed Slope Coefficient (m)		4.39699		Speed Power Coefficient (p)		0.49215	
PF Slope Coefficient (m)		-1.24708		PF Power Coefficient (p)		0.80425	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		1.8	
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0	
Subsegment Data							

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1877	-	-	67.9

Vehicle Results

Average Speed, mi/h	67.9	Percent Followers, %	38.8
Segment Travel Time, minutes	0.31	Follower Density (FD), followers/mi/ln	1.8
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	314	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.66	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 11

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1872
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	314	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	5.26
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.18

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.58354	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.26676	PF Power Coefficient (p)	0.76864
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.9
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1872	-	-	67.6

Vehicle Results

Average Speed, mi/h	67.6	Percent Followers, %	40.5
Segment Travel Time, minutes	0.31	Follower Density (FD), followers/mi/ln	1.9
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	314	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.66	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 12					
Vehicle Inputs					
Segment Type		Passing Zone		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				3603	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		314		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.88		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.18	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
Speed Slope Coefficient (m)		4.42064		Speed Power Coefficient (p)	
PF Slope Coefficient (m)		-1.20239		PF Power Coefficient (p)	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln	
%Improvement to Percent Followers		0.0		%Improvement to Speed	
				0.0	
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3603	-	-	67.9
Vehicle Results					
Average Speed, mi/h		67.9		Percent Followers, %	
Segment Travel Time, minutes		0.60		Follower Density (FD), followers/mi/ln	
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0		Pavement Condition Rating	
Flow Rate Outside Lane, veh/h		314		Bicycle Effective Width, ft	
Bicycle LOS Score		3.66		Bicycle Effective Speed Factor	
Bicycle LOS		D			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Constrained		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				1053	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		314		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.88		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.18	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
				70.0	

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29321	PF Power Coefficient (p)	0.75821
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.9
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1053	-	-	67.6

Vehicle Results

Average Speed, mi/h	67.6	Percent Followers, %	41.5
Segment Travel Time, minutes	0.18	Follower Density (FD), followers/mi/ln	1.9
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	314	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.66	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 14

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1120
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	314	Opposing Demand Flow Rate, veh/h	430
Peak Hour Factor	0.88	Total Trucks, %	5.26
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.18

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.38709	Speed Power Coefficient (p)	0.49215
PF Slope Coefficient (m)	-1.27337	PF Power Coefficient (p)	0.79352
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.8
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1120	-	-	67.9

Vehicle Results

Average Speed, mi/h	67.9	Percent Followers, %	39.8
Segment Travel Time, minutes	0.19	Follower Density (FD), followers/mi/ln	1.8
Vehicle LOS	A		

Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		314	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.66	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 15					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1272
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		409	Opposing Demand Flow Rate, veh/h		536
Peak Hour Factor		0.88	Total Trucks, %		5.09
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.24
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.41232	Speed Power Coefficient (p)		0.47739
PF Slope Coefficient (m)		-1.28274	PF Power Coefficient (p)		0.78869
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.8
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1272	-	-	67.5
Vehicle Results					
Average Speed, mi/h		67.5	Percent Followers, %		46.9
Segment Travel Time, minutes		0.21	Follower Density (FD), followers/mi/ln		2.8
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		409	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.74	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 16					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		625
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					

Directional Demand Flow Rate, veh/h		409	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		5.09
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.24
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29323	PF Power Coefficient (p)		0.75819
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.9
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	625	-	-	67.2
Vehicle Results					
Average Speed, mi/h		67.2	Percent Followers, %		48.1
Segment Travel Time, minutes		0.11	Follower Density (FD), followers/mi/ln		2.9
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		409	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.74	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 17					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1995
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		409	Opposing Demand Flow Rate, veh/h		536
Peak Hour Factor		0.88	Total Trucks, %		5.09
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.24
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.42412	Speed Power Coefficient (p)		0.47739
PF Slope Coefficient (m)		-1.25168	PF Power Coefficient (p)		0.80109
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.8
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	1995	-	-	67.5
Vehicle Results					
Average Speed, mi/h		67.5	Percent Followers, %		45.8
Segment Travel Time, minutes		0.34	Follower Density (FD), followers/mi/ln		2.8
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		409	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.74	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 18					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1399
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		409	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		5.09
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.24
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57524	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.28884	PF Power Coefficient (p)		0.75993
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.9
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1399	-	-	67.2
Vehicle Results					
Average Speed, mi/h		67.2	Percent Followers, %		48.0
Segment Travel Time, minutes		0.24	Follower Density (FD), followers/mi/ln		2.9
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		409	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.74	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 19					

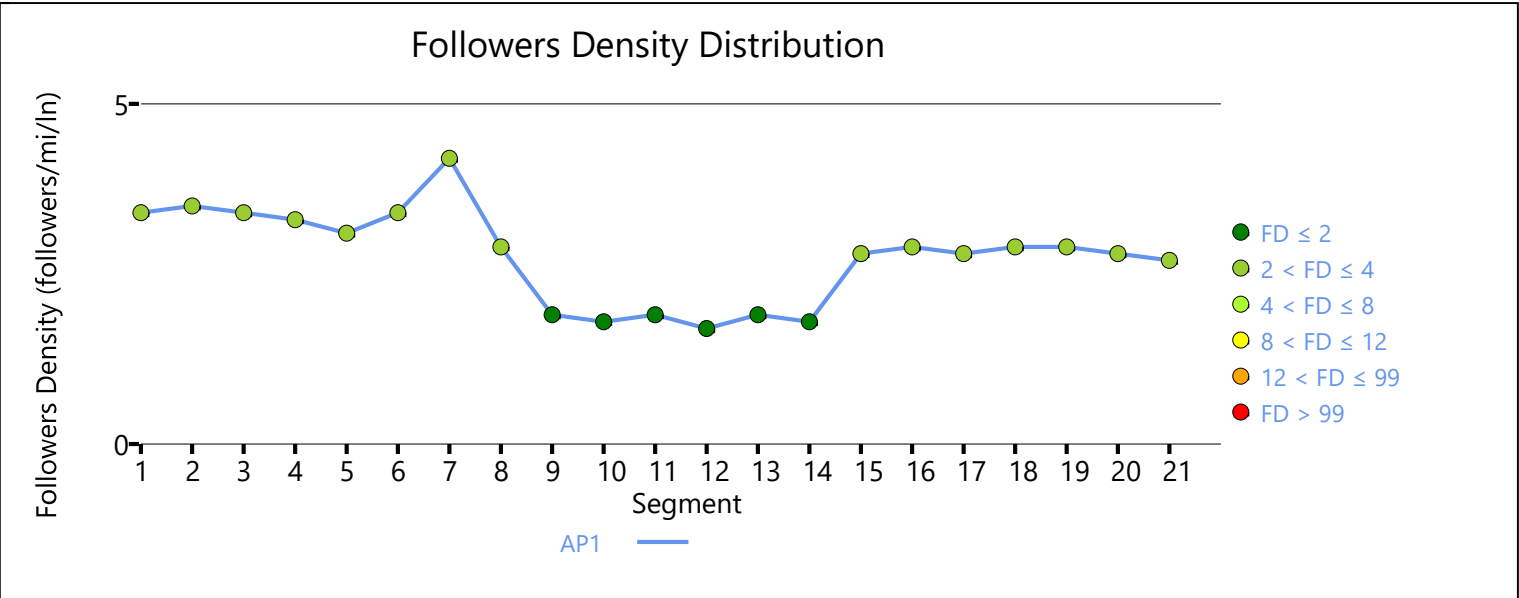
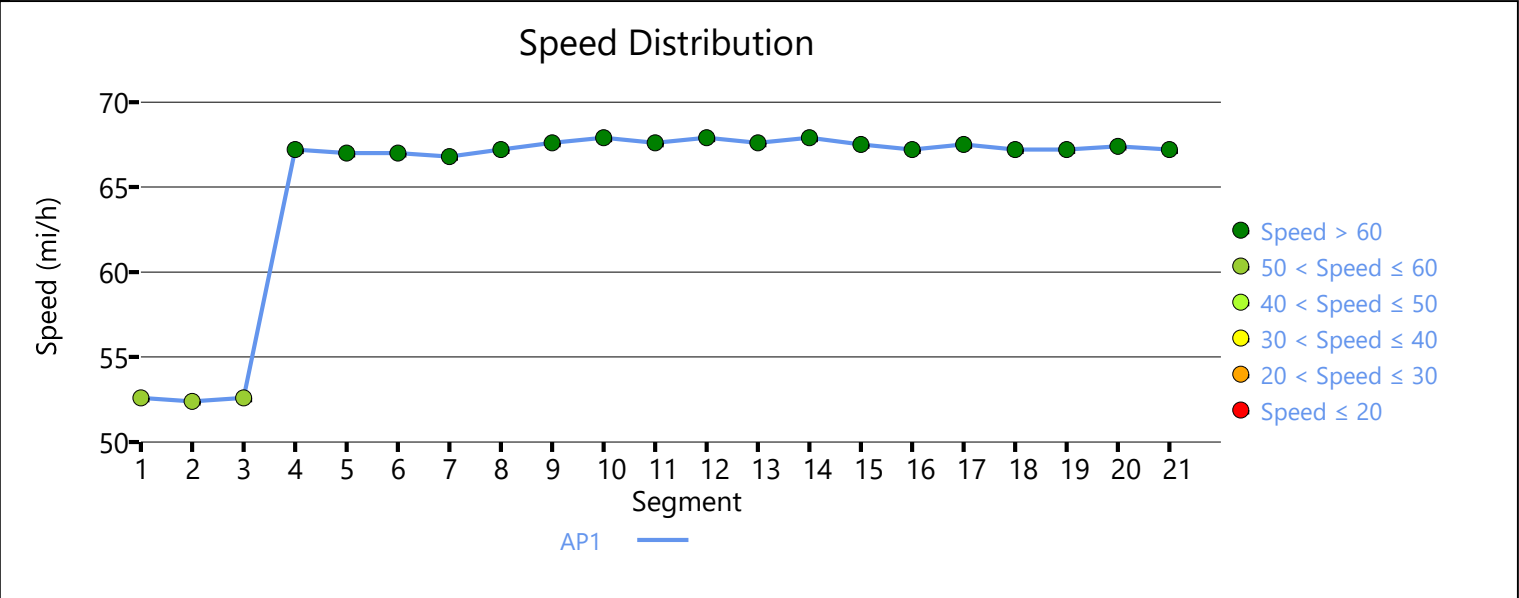
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1254
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		402	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		1.51
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.24
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29366	PF Power Coefficient (p)		0.75766
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.9
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1254	-	-	67.2
Vehicle Results					
Average Speed, mi/h		67.2	Percent Followers, %		47.7
Segment Travel Time, minutes		0.21	Follower Density (FD), followers/mi/ln		2.9
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		402	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.72	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 20					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1108
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		402	Opposing Demand Flow Rate, veh/h		848
Peak Hour Factor		0.88	Total Trucks, %		1.51
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.24
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.47406	Speed Power Coefficient (p)		0.44728
PF Slope Coefficient (m)		-1.29735	PF Power Coefficient (p)		0.77650

In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.8
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1108	-	-	67.4
Vehicle Results					
Average Speed, mi/h		67.4	Percent Followers, %		47.3
Segment Travel Time, minutes		0.19	Follower Density (FD), followers/mi/ln		2.8
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		402	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.72	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 21					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		2901
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		402	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		1.51
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.24
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.59854	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.23554	PF Power Coefficient (p)		0.77974
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2901	-	-	67.2
Vehicle Results					
Average Speed, mi/h		67.2	Percent Followers, %		45.5
Segment Travel Time, minutes		0.49	Follower Density (FD), followers/mi/ln		2.7
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4

Flow Rate Outside Lane, veh/h	402	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.72	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Facility Results				
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	541	0.32	2.7	B



HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	5/11/2023
Agency	HRG	Analysis Year	2050 NB
Jurisdiction	SDDOT	Time Analyzed	AM Peak
Project Description	SD 38 WB East of Hartford	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1727
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	280	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	8.97
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.16

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.58112	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.27241	PF Power Coefficient (p)	0.76681
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.6
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1727	-	-	67.8

Vehicle Results

Average Speed, mi/h	67.8	Percent Followers, %	38.0
Segment Travel Time, minutes	0.29	Follower Density (FD), followers/mi/ln	1.6
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	280	Bicycle Effective Width, ft	24
Bicycle LOS Score	4.96	Bicycle Effective Speed Factor	5.07
Bicycle LOS	E		

Segment 2

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1676
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		280	Opposing Demand Flow Rate, veh/h		811
Peak Hour Factor		0.88	Total Trucks, %		8.97
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.16
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.47404	Speed Power Coefficient (p)		0.45007
PF Slope Coefficient (m)		-1.27736	PF Power Coefficient (p)		0.78596
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1676	-	-	67.9
Vehicle Results					
Average Speed, mi/h		67.9	Percent Followers, %		37.4
Segment Travel Time, minutes		0.28	Follower Density (FD), followers/mi/ln		1.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		280	Bicycle Effective Width, ft		24
Bicycle LOS Score		4.96	Bicycle Effective Speed Factor		5.07
Bicycle LOS		E			
Segment 3					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1864
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		306	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		17.04
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.18
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.58341	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.26572	PF Power Coefficient (p)		0.77025
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.8
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1864	-	-	67.6

Vehicle Results

Average Speed, mi/h	67.6	Percent Followers, %	39.8
Segment Travel Time, minutes	0.31	Follower Density (FD), followers/mi/ln	1.8
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	306	Bicycle Effective Width, ft	24
Bicycle LOS Score	8.99	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 4

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	718
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	306	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	17.04
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.18

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29182	PF Power Coefficient (p)	0.75993
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.8
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	718	-	-	67.6

Vehicle Results

Average Speed, mi/h	67.6	Percent Followers, %	40.8
Segment Travel Time, minutes	0.12	Follower Density (FD), followers/mi/ln	1.8
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	306	Bicycle Effective Width, ft	24
Bicycle LOS Score	8.99	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1738
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		306	Opposing Demand Flow Rate, veh/h		456
Peak Hour Factor		0.88	Total Trucks, %		17.04
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.18
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.40112	Speed Power Coefficient (p)		0.48825
PF Slope Coefficient (m)		-1.25400	PF Power Coefficient (p)		0.80244
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1738	-	-	68.0
Vehicle Results					
Average Speed, mi/h		68.0	Percent Followers, %		38.4
Segment Travel Time, minutes		0.29	Follower Density (FD), followers/mi/ln		1.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		306	Bicycle Effective Width, ft		24
Bicycle LOS Score		8.99	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		579
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		306	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		17.04
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.18
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29182	PF Power Coefficient (p)	0.75993
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.8
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	579	-	-	67.6

Vehicle Results			
Average Speed, mi/h	67.6	Percent Followers, %	40.8
Segment Travel Time, minutes	0.10	Follower Density (FD), followers/mi/ln	1.8
Vehicle LOS	A		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	306	Bicycle Effective Width, ft	24
Bicycle LOS Score	8.99	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 7

Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	2262
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	263	Opposing Demand Flow Rate, veh/h	360
Peak Hour Factor	0.88	Total Trucks, %	18.44
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.15

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.38489	Speed Power Coefficient (p)	0.50362
PF Slope Coefficient (m)	-1.22431	PF Power Coefficient (p)	0.81530
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2262	-	-	68.2

Vehicle Results			
Average Speed, mi/h	68.2	Percent Followers, %	33.7
Segment Travel Time, minutes	0.38	Follower Density (FD), followers/mi/ln	1.3
Vehicle LOS	A		

Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		262	Bicycle Effective Width, ft		24
Bicycle LOS Score		9.75	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 8					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		980
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		263	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29166	PF Power Coefficient (p)		0.76014
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	980	-	-	67.9
Vehicle Results					
Average Speed, mi/h		67.9	Percent Followers, %		37.3
Segment Travel Time, minutes		0.16	Follower Density (FD), followers/mi/ln		1.4
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		262	Bicycle Effective Width, ft		24
Bicycle LOS Score		9.75	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 9					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		3667
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					

Directional Demand Flow Rate, veh/h		263	Opposing Demand Flow Rate, veh/h		360
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.40330	Speed Power Coefficient (p)		0.50362
PF Slope Coefficient (m)		-1.19252	PF Power Coefficient (p)		0.82659
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3667	-	-	68.2
Vehicle Results					
Average Speed, mi/h		68.2	Percent Followers, %		32.6
Segment Travel Time, minutes		0.61	Follower Density (FD), followers/mi/ln		1.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		262	Bicycle Effective Width, ft		24
Bicycle LOS Score		9.75	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1846
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		263	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.58311	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.26629	PF Power Coefficient (p)		0.77017
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	1846	-	-	67.9
Vehicle Results					
Average Speed, mi/h		67.9	Percent Followers, %		36.4
Segment Travel Time, minutes		0.31	Follower Density (FD), followers/mi/ln		1.4
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		262	Bicycle Effective Width, ft		24
Bicycle LOS Score		9.75	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		2174
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		263	Opposing Demand Flow Rate, veh/h		360
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.38357	Speed Power Coefficient (p)		0.50362
PF Slope Coefficient (m)		-1.22716	PF Power Coefficient (p)		0.81417
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2174	-	-	68.2
Vehicle Results					
Average Speed, mi/h		68.2	Percent Followers, %		33.8
Segment Travel Time, minutes		0.36	Follower Density (FD), followers/mi/ln		1.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		262	Bicycle Effective Width, ft		24
Bicycle LOS Score		9.75	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 12					

Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1277
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		263	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29166	PF Power Coefficient (p)		0.76014
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1277	-	-	67.9
Vehicle Results					
Average Speed, mi/h		67.9	Percent Followers, %		37.3
Segment Travel Time, minutes		0.21	Follower Density (FD), followers/mi/ln		1.4
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		262	Bicycle Effective Width, ft		24
Bicycle LOS Score		9.75	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		779
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		263	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.15
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29166	PF Power Coefficient (p)		0.76014

In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.4
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	779	-	-	67.9

Vehicle Results

Average Speed, mi/h	67.9	Percent Followers, %	37.3
Segment Travel Time, minutes	0.13	Follower Density (FD), followers/mi/ln	1.4
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	262	Bicycle Effective Width, ft	24
Bicycle LOS Score	9.75	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 14

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	422
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	358	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	13.95
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.21

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29219	PF Power Coefficient (p)	0.75948
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.4
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	422	-	-	67.4

Vehicle Results

Average Speed, mi/h	67.4	Percent Followers, %	44.7
Segment Travel Time, minutes	0.07	Follower Density (FD), followers/mi/ln	2.4
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
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Flow Rate Outside Lane, veh/h	358	Bicycle Effective Width, ft	24
Bicycle LOS Score	7.38	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 15

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1478
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	310	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	19.53
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.18

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57671	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.28298	PF Power Coefficient (p)	0.76370
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.9
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1478	-	-	67.6

Vehicle Results

Average Speed, mi/h	67.6	Percent Followers, %	40.8
Segment Travel Time, minutes	0.25	Follower Density (FD), followers/mi/ln	1.9
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	310	Bicycle Effective Width, ft	24
Bicycle LOS Score	10.52	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 16

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	384
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	445	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	12.76
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.26

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29233	PF Power Coefficient (p)	0.75931
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	384	-	-	67.1

Vehicle Results			
Average Speed, mi/h	67.1	Percent Followers, %	50.3
Segment Travel Time, minutes	0.07	Follower Density (FD), followers/mi/ln	3.3
Vehicle LOS	B		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	445	Bicycle Effective Width, ft	24
Bicycle LOS Score	6.89	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 17

Vehicle Inputs			
Segment Type	Passing Constrained	Length, ft	3732
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	434	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	12.21
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.26

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.60878	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.21846	PF Power Coefficient (p)	0.78615
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.0
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3732	-	-	67.1

Vehicle Results			
Average Speed, mi/h	67.1	Percent Followers, %	46.9

Segment Travel Time, minutes		0.63	Follower Density (FD), followers/mi/ln		3.0
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		434	Bicycle Effective Width, ft		24
Bicycle LOS Score		6.61	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 18					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1360
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		434	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		12.21
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.26
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57450	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29014	PF Power Coefficient (p)		0.76012
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		3.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1360	-	-	67.1
Vehicle Results					
Average Speed, mi/h		67.1	Percent Followers, %		49.5
Segment Travel Time, minutes		0.23	Follower Density (FD), followers/mi/ln		3.2
Vehicle LOS		B			

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	434	Bicycle Effective Width, ft	24
Bicycle LOS Score	6.61	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		
Segment 19			
Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	1595
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity							
Directional Demand Flow Rate, veh/h		434		Opposing Demand Flow Rate, veh/h		816	
Peak Hour Factor		0.88		Total Trucks, %		12.21	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.26	
Intermediate Results							
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0	
Speed Slope Coefficient (m)		4.47345		Speed Power Coefficient (p)		0.44971	
PF Slope Coefficient (m)		-1.28088		PF Power Coefficient (p)		0.78481	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		3.1	
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0	
Subsegment Data							
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h		
1	Tangent	1595	-	-	67.3		
Vehicle Results							
Average Speed, mi/h		67.3		Percent Followers, %		48.6	
Segment Travel Time, minutes		0.27		Follower Density (FD), followers/mi/ln		3.1	
Vehicle LOS		B					
Bicycle Results							
Percent Occupied Parking		0		Pavement Condition Rating		4	
Flow Rate Outside Lane, veh/h		434		Bicycle Effective Width, ft		24	
Bicycle LOS Score		6.61		Bicycle Effective Speed Factor		5.07	
Bicycle LOS		F					
Segment 20							
Vehicle Inputs							
Segment Type		Passing Constrained		Length, ft		595	
Measured FFS		Measured		Free-Flow Speed, mi/h		70.0	
Demand and Capacity							
Directional Demand Flow Rate, veh/h		434		Opposing Demand Flow Rate, veh/h		-	
Peak Hour Factor		0.88		Total Trucks, %		12.21	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.26	
Intermediate Results							
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0	
Speed Slope Coefficient (m)		4.57372		Speed Power Coefficient (p)		0.41674	
PF Slope Coefficient (m)		-1.29239		PF Power Coefficient (p)		0.75923	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		3.2	
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0	
Subsegment Data							

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	595	-	-	67.1

Vehicle Results

Average Speed, mi/h	67.1	Percent Followers, %	49.6
Segment Travel Time, minutes	0.10	Follower Density (FD), followers/mi/ln	3.2
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	434	Bicycle Effective Width, ft	24
Bicycle LOS Score	6.61	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 21

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	958
Measured FFS	Measured	Free-Flow Speed, mi/h	55.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	350	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	10.81
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.21

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.43859	PF Power Coefficient (p)	0.72596
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	3.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	958	-	-	52.4

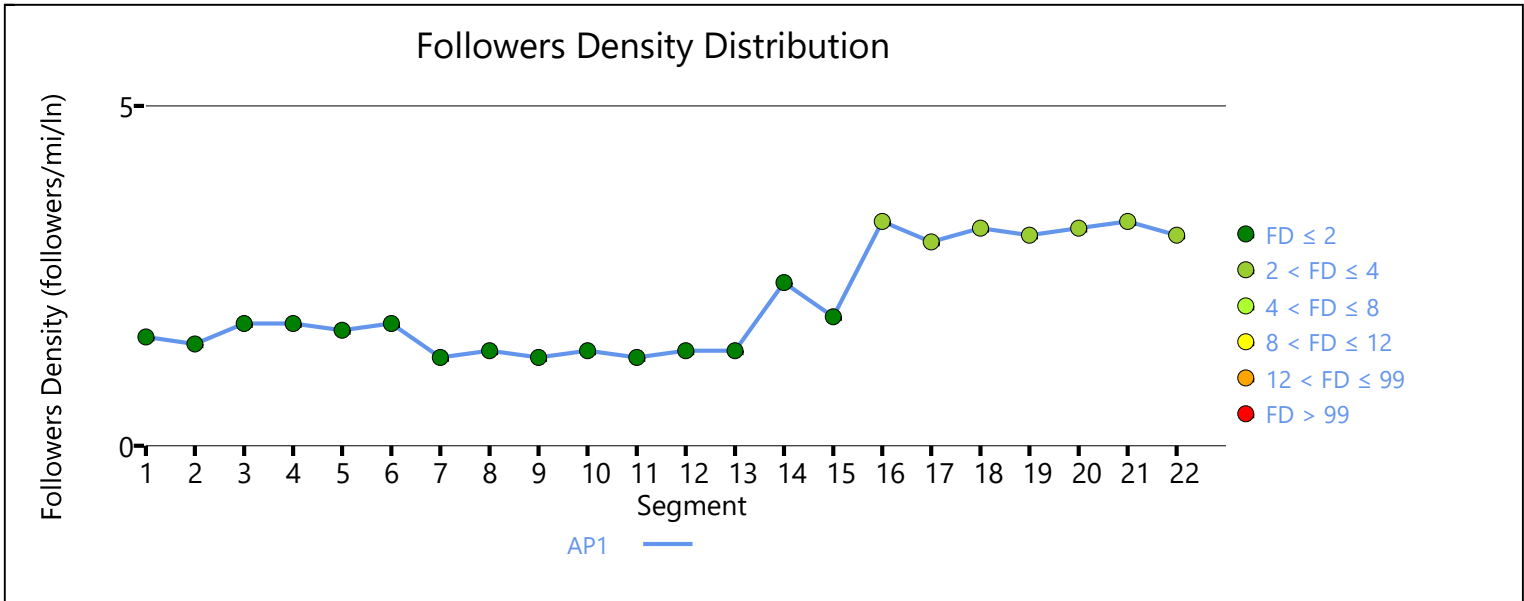
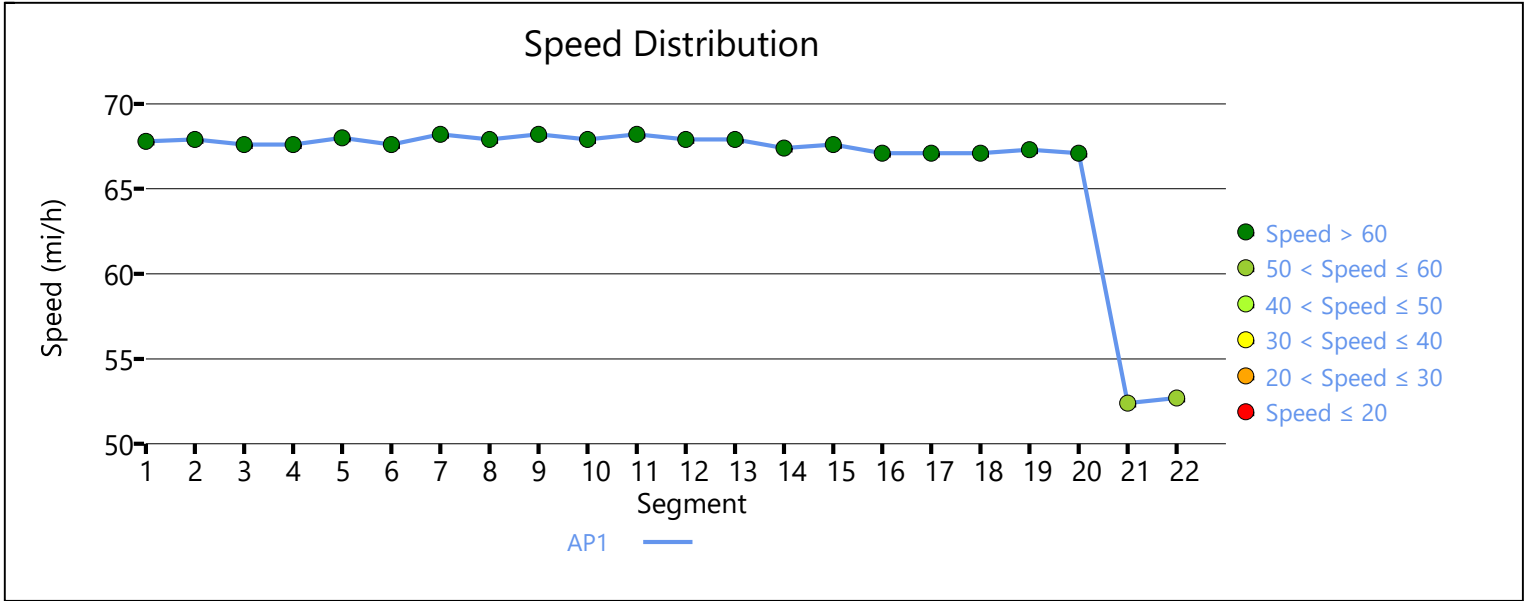
Vehicle Results

Average Speed, mi/h	52.4	Percent Followers, %	48.9
Segment Travel Time, minutes	0.21	Follower Density (FD), followers/mi/ln	3.3
Vehicle LOS	B		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	350	Bicycle Effective Width, ft	24
Bicycle LOS Score	5.45	Bicycle Effective Speed Factor	4.62
Bicycle LOS	E		

Segment 22					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft	1659	
Measured FFS		Measured	Free-Flow Speed, mi/h	55.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		350	Opposing Demand Flow Rate, veh/h	585	
Peak Hour Factor		0.88	Total Trucks, %	10.81	
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)	0.21	
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h	55.0	
Speed Slope Coefficient (m)		4.42925	Speed Power Coefficient (p)	0.47156	
PF Slope Coefficient (m)		-1.37257	PF Power Coefficient (p)	0.75811	
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln	3.1	
%Improvement to Percent Followers		0.0	%Improvement to Speed	0.0	
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1659	-	-	52.7
Vehicle Results					
Average Speed, mi/h		52.7	Percent Followers, %	46.2	
Segment Travel Time, minutes		0.36	Follower Density (FD), followers/mi/ln	3.1	
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating	4	
Flow Rate Outside Lane, veh/h		350	Bicycle Effective Width, ft	24	
Bicycle LOS Score		5.45	Bicycle Effective Speed Factor	4.62	
Bicycle LOS		E			
Facility Results					
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS	
1	446	0.23	2.0	B	



HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	5/11/2023
Agency	HRG	Analysis Year	2050 NB
Jurisdiction	SDDOT	Time Analyzed	PM Peak
Project Description	SD 38 WB East of Hartford	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1727
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	848	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	8.97
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.50

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.58112	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.27241	PF Power Coefficient (p)	0.76681
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	8.7
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1727	-	-	65.9

Vehicle Results

Average Speed, mi/h	65.9	Percent Followers, %	67.4
Segment Travel Time, minutes	0.30	Follower Density (FD), followers/mi/ln	8.7
Vehicle LOS	D		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	848	Bicycle Effective Width, ft	24
Bicycle LOS Score	5.52	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 2

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1676
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		848	Opposing Demand Flow Rate, veh/h		402
Peak Hour Factor		0.88	Total Trucks, %		8.97
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.50
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.38668	Speed Power Coefficient (p)		0.49646
PF Slope Coefficient (m)		-1.25223	PF Power Coefficient (p)		0.80275
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		8.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1676	-	-	66.2
Vehicle Results					
Average Speed, mi/h		66.2	Percent Followers, %		66.6
Segment Travel Time, minutes		0.29	Follower Density (FD), followers/mi/ln		8.5
Vehicle LOS		D			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		848	Bicycle Effective Width, ft		24
Bicycle LOS Score		5.52	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 3					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1864
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		536	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		17.04
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.32
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.58341	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.26572	PF Power Coefficient (p)		0.77025
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		4.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1864	-	-	66.8

Vehicle Results

Average Speed, mi/h	66.8	Percent Followers, %	54.3
Segment Travel Time, minutes	0.32	Follower Density (FD), followers/mi/ln	4.4
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	536	Bicycle Effective Width, ft	24
Bicycle LOS Score	9.28	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 4

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	718
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	536	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	17.04
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.32

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29182	PF Power Coefficient (p)	0.75993
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.4
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	718	-	-	66.8

Vehicle Results

Average Speed, mi/h	66.8	Percent Followers, %	55.3
Segment Travel Time, minutes	0.12	Follower Density (FD), followers/mi/ln	4.4
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	536	Bicycle Effective Width, ft	24
Bicycle LOS Score	9.28	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Zone		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				1738	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		536		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.88		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.32	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
Speed Slope Coefficient (m)		4.38950		Speed Power Coefficient (p)	
PF Slope Coefficient (m)		-1.24935		PF Power Coefficient (p)	
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln	
%Improvement to Percent Followers		0.0		%Improvement to Speed	
				0.0	
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1738	-	-	67.1
Vehicle Results					
Average Speed, mi/h		67.1		Percent Followers, %	
Segment Travel Time, minutes		0.29		Follower Density (FD), followers/mi/ln	
Vehicle LOS		C			
Bicycle Results					
Percent Occupied Parking		0		Pavement Condition Rating	
Flow Rate Outside Lane, veh/h		536		Bicycle Effective Width, ft	
Bicycle LOS Score		9.28		Bicycle Effective Speed Factor	
Bicycle LOS		F			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained		Length, ft	
Measured FFS		Measured		Free-Flow Speed, mi/h	
				579	
				70.0	
Demand and Capacity					
Directional Demand Flow Rate, veh/h		536		Opposing Demand Flow Rate, veh/h	
Peak Hour Factor		0.88		Total Trucks, %	
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)	
				0.32	
Intermediate Results					
Segment Vertical Class		1		Free-Flow Speed, mi/h	
				70.0	

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29182	PF Power Coefficient (p)	0.75993
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.4
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	579	-	-	66.8

Vehicle Results			
Average Speed, mi/h	66.8	Percent Followers, %	55.3
Segment Travel Time, minutes	0.10	Follower Density (FD), followers/mi/ln	4.4
Vehicle LOS	C		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	536	Bicycle Effective Width, ft	24
Bicycle LOS Score	9.28	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 7

Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	2262
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	430	Opposing Demand Flow Rate, veh/h	314
Peak Hour Factor	0.88	Total Trucks, %	18.44
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.25

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.37173	Speed Power Coefficient (p)	0.51243
PF Slope Coefficient (m)	-1.21815	PF Power Coefficient (p)	0.81800
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.9
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2262	-	-	67.5

Vehicle Results			
Average Speed, mi/h	67.5	Percent Followers, %	45.7
Segment Travel Time, minutes	0.38	Follower Density (FD), followers/mi/ln	2.9
Vehicle LOS	B		

Bicycle Results											
Percent Occupied Parking		0		Pavement Condition Rating		4					
Flow Rate Outside Lane, veh/h		430		Bicycle Effective Width, ft		24					
Bicycle LOS Score		10.00		Bicycle Effective Speed Factor		5.07					
Bicycle LOS		F									
Segment 8											
Vehicle Inputs											
Segment Type		Passing Constrained		Length, ft		980					
Measured FFS		Measured		Free-Flow Speed, mi/h		70.0					
Demand and Capacity											
Directional Demand Flow Rate, veh/h		430		Opposing Demand Flow Rate, veh/h		-					
Peak Hour Factor		0.88		Total Trucks, %		18.44					
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.25					
Intermediate Results											
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0					
Speed Slope Coefficient (m)		4.57372		Speed Power Coefficient (p)		0.41674					
PF Slope Coefficient (m)		-1.29166		PF Power Coefficient (p)		0.76014					
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		3.2					
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0					
Subsegment Data											
#	Segment Type		Length, ft		Radius, ft		Superelevation, %		Average Speed, mi/h		
1	Tangent		980		-		-		67.1		
Vehicle Results											
Average Speed, mi/h			67.1			Percent Followers, %			49.3		
Segment Travel Time, minutes			0.17			Follower Density (FD), followers/mi/ln			3.2		
Vehicle LOS			B								
Bicycle Results											
Percent Occupied Parking			0			Pavement Condition Rating			4		
Flow Rate Outside Lane, veh/h			430			Bicycle Effective Width, ft			24		
Bicycle LOS Score			10.00			Bicycle Effective Speed Factor			5.07		
Bicycle LOS			F								
Segment 9											
Vehicle Inputs											
Segment Type			Passing Zone			Length, ft			3667		
Measured FFS			Measured			Free-Flow Speed, mi/h			70.0		
Demand and Capacity											

Directional Demand Flow Rate, veh/h		430	Opposing Demand Flow Rate, veh/h		314
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.25
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.39013	Speed Power Coefficient (p)		0.51243
PF Slope Coefficient (m)		-1.18655	PF Power Coefficient (p)		0.82939
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.8
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3667	-	-	67.5
Vehicle Results					
Average Speed, mi/h		67.5	Percent Followers, %		44.5
Segment Travel Time, minutes		0.62	Follower Density (FD), followers/mi/ln		2.8
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		430	Bicycle Effective Width, ft		24
Bicycle LOS Score		10.00	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1846
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		430	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.25
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.58311	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.26629	PF Power Coefficient (p)		0.77017
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		3.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	1846	-	-	67.1
Vehicle Results					
Average Speed, mi/h		67.1	Percent Followers, %		48.3
Segment Travel Time, minutes		0.31	Follower Density (FD), followers/mi/ln		3.1
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		430	Bicycle Effective Width, ft		24
Bicycle LOS Score		10.00	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		2174
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		430	Opposing Demand Flow Rate, veh/h		314
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.25
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.37041	Speed Power Coefficient (p)		0.51243
PF Slope Coefficient (m)		-1.22098	PF Power Coefficient (p)		0.81685
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.9
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2174	-	-	67.5
Vehicle Results					
Average Speed, mi/h		67.5	Percent Followers, %		45.8
Segment Travel Time, minutes		0.37	Follower Density (FD), followers/mi/ln		2.9
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		430	Bicycle Effective Width, ft		24
Bicycle LOS Score		10.00	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 12					

Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1277
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		430	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.25
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29166	PF Power Coefficient (p)		0.76014
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		3.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1277	-	-	67.1
Vehicle Results					
Average Speed, mi/h		67.1	Percent Followers, %		49.3
Segment Travel Time, minutes		0.22	Follower Density (FD), followers/mi/ln		3.2
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		430	Bicycle Effective Width, ft		24
Bicycle LOS Score		10.00	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		779
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		430	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		18.44
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.25
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29166	PF Power Coefficient (p)		0.76014

In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		3.2
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	779	-	-	67.1
Vehicle Results					
Average Speed, mi/h		67.1	Percent Followers, %		49.3
Segment Travel Time, minutes		0.13	Follower Density (FD), followers/mi/ln		3.2
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		430	Bicycle Effective Width, ft		24
Bicycle LOS Score		10.00	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 14					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		422
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		607	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		13.95
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.36
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29219	PF Power Coefficient (p)		0.75948
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		5.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	422	-	-	66.6
Vehicle Results					
Average Speed, mi/h		66.6	Percent Followers, %		58.7
Segment Travel Time, minutes		0.07	Follower Density (FD), followers/mi/ln		5.4
Vehicle LOS		C			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4

Flow Rate Outside Lane, veh/h	607	Bicycle Effective Width, ft	24
Bicycle LOS Score	7.64	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 15

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1478
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	524	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	19.53
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.31

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57671	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.28298	PF Power Coefficient (p)	0.76370
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	4.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1478	-	-	66.8

Vehicle Results

Average Speed, mi/h	66.8	Percent Followers, %	54.3
Segment Travel Time, minutes	0.25	Follower Density (FD), followers/mi/ln	4.3
Vehicle LOS	C		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	524	Bicycle Effective Width, ft	24
Bicycle LOS Score	10.78	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 16

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	384
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	990	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	12.76
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.58

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29233	PF Power Coefficient (p)	0.75931
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	10.9
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	384	-	-	65.6

Vehicle Results			
Average Speed, mi/h	65.6	Percent Followers, %	72.3
Segment Travel Time, minutes	0.07	Follower Density (FD), followers/mi/ln	10.9
Vehicle LOS	D		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	990	Bicycle Effective Width, ft	24
Bicycle LOS Score	7.29	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 17

Vehicle Inputs			
Segment Type	Passing Constrained	Length, ft	3732
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	986	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	12.21
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.58

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.60878	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.21846	PF Power Coefficient (p)	0.78615
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	10.5
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3732	-	-	65.6

Vehicle Results			
Average Speed, mi/h	65.6	Percent Followers, %	70.0

Segment Travel Time, minutes	0.65	Follower Density (FD), followers/mi/ln	10.5
Vehicle LOS	D		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	986	Bicycle Effective Width, ft	24
Bicycle LOS Score	7.03	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 18

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	1360
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	986	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	12.21
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.58

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57450	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29014	PF Power Coefficient (p)	0.76012
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	10.8
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1360	-	-	65.6

Vehicle Results

Average Speed, mi/h	65.6	Percent Followers, %	72.1
Segment Travel Time, minutes	0.24	Follower Density (FD), followers/mi/ln	10.8
Vehicle LOS	D		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	986	Bicycle Effective Width, ft	24
Bicycle LOS Score	7.03	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 19

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1595
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		986	Opposing Demand Flow Rate, veh/h		445
Peak Hour Factor		0.88	Total Trucks, %		12.21
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.58
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.39614	Speed Power Coefficient (p)		0.48975
PF Slope Coefficient (m)		-1.26001	PF Power Coefficient (p)		0.79959
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		10.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1595	-	-	65.9
Vehicle Results					
Average Speed, mi/h		65.9	Percent Followers, %		71.2
Segment Travel Time, minutes		0.28	Follower Density (FD), followers/mi/ln		10.7
Vehicle LOS		D			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		986	Bicycle Effective Width, ft		24
Bicycle LOS Score		7.03	Bicycle Effective Speed Factor		5.07
Bicycle LOS		F			
Segment 20					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		595
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		986	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		12.21
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.58
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29239	PF Power Coefficient (p)		0.75923
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		10.8
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	595	-	-	65.7

Vehicle Results

Average Speed, mi/h	65.7	Percent Followers, %	72.2
Segment Travel Time, minutes	0.10	Follower Density (FD), followers/mi/ln	10.8
Vehicle LOS	D		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	986	Bicycle Effective Width, ft	24
Bicycle LOS Score	7.03	Bicycle Effective Speed Factor	5.07
Bicycle LOS	F		

Segment 21

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	958
Measured FFS	Measured	Free-Flow Speed, mi/h	55.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	674	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	10.81
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.40

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	55.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.43859	PF Power Coefficient (p)	0.72596
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	8.7
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	958	-	-	51.4

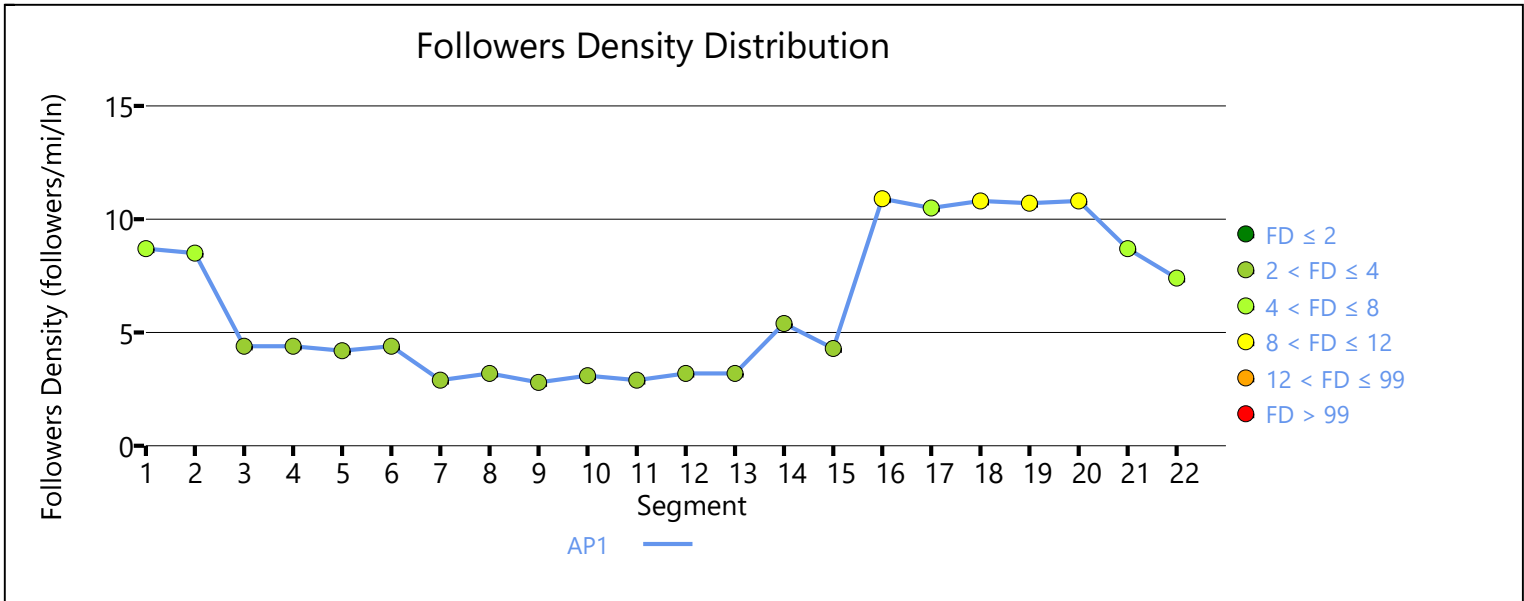
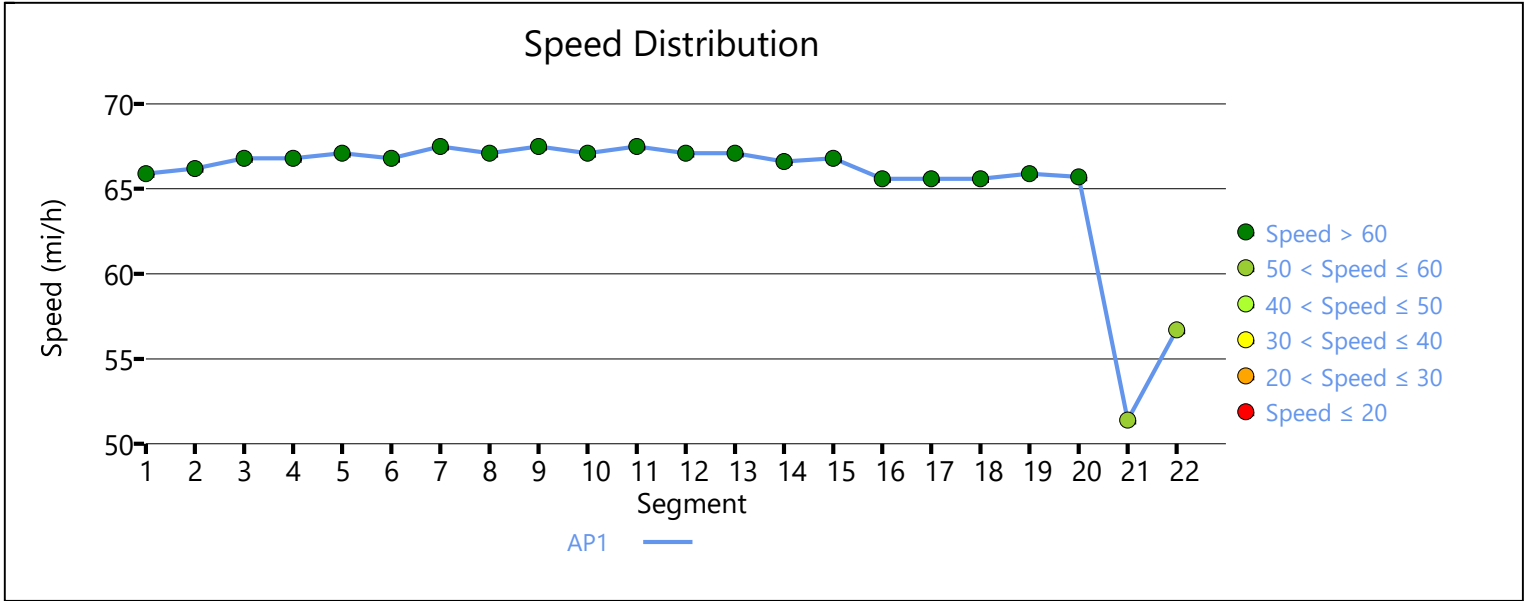
Vehicle Results

Average Speed, mi/h	51.4	Percent Followers, %	66.0
Segment Travel Time, minutes	0.21	Follower Density (FD), followers/mi/ln	8.7
Vehicle LOS	D		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	674	Bicycle Effective Width, ft	24
Bicycle LOS Score	5.78	Bicycle Effective Speed Factor	4.62
Bicycle LOS	F		

Segment 22					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1659
Measured FFS		Measured	Free-Flow Speed, mi/h		60.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		674	Opposing Demand Flow Rate, veh/h		368
Peak Hour Factor		0.88	Total Trucks, %		10.81
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.40
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		60.0
Speed Slope Coefficient (m)		4.37738	Speed Power Coefficient (p)		0.50221
PF Slope Coefficient (m)		-1.31799	PF Power Coefficient (p)		0.78037
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		7.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1659	-	-	56.7
Vehicle Results					
Average Speed, mi/h		56.7	Percent Followers, %		62.0
Segment Travel Time, minutes		0.33	Follower Density (FD), followers/mi/ln		7.4
Vehicle LOS		C			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		674	Bicycle Effective Width, ft		24
Bicycle LOS Score		5.78	Bicycle Effective Speed Factor		4.62
Bicycle LOS		F			
Facility Results					
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln		LOS
1	894	0.71	6.0		C



HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	5/11/2023
Agency	HRG	Analysis Year	2050 NB
Jurisdiction	SDDOT	Time Analyzed	AM Peak
Project Description	West of Hartford SD 38 EB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1069
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	243	Opposing Demand Flow Rate, veh/h	169
Peak Hour Factor	0.88	Total Trucks, %	5.79
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.14

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.30713	Speed Power Coefficient (p)	0.54838
PF Slope Coefficient (m)	-1.23090	PF Power Coefficient (p)	0.80942
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1069	-	-	68.5

Vehicle Results

Average Speed, mi/h	68.5	Percent Followers, %	32.4
Segment Travel Time, minutes	0.18	Follower Density (FD), followers/mi/ln	1.2
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	243	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.70	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 2

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	664
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		243	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		5.79
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.14
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29315	PF Power Coefficient (p)		0.75829
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	664	-	-	68.0
Vehicle Results					
Average Speed, mi/h		68.0	Percent Followers, %		35.8
Segment Travel Time, minutes		0.11	Follower Density (FD), followers/mi/ln		1.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		243	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.70	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 3					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1871
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		243	Opposing Demand Flow Rate, veh/h		169
Peak Hour Factor		0.88	Total Trucks, %		5.79
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.14
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.31694	Speed Power Coefficient (p)		0.54838
PF Slope Coefficient (m)		-1.20586	PF Power Coefficient (p)		0.82063
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1871	-	-	68.5

Vehicle Results

Average Speed, mi/h	68.5	Percent Followers, %	31.5
Segment Travel Time, minutes	0.31	Follower Density (FD), followers/mi/ln	1.1
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	243	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.70	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 4

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	925
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	243	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	5.79
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.14

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29315	PF Power Coefficient (p)	0.75829
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	925	-	-	68.0

Vehicle Results

Average Speed, mi/h	68.0	Percent Followers, %	35.8
Segment Travel Time, minutes	0.15	Follower Density (FD), followers/mi/ln	1.3
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	243	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.70	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		4476
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		243	Opposing Demand Flow Rate, veh/h		169
Peak Hour Factor		0.88	Total Trucks, %		5.79
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.14
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.35043	Speed Power Coefficient (p)		0.54838
PF Slope Coefficient (m)		-1.15155	PF Power Coefficient (p)		0.84082
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	4476	-	-	68.5
Vehicle Results					
Average Speed, mi/h		68.5	Percent Followers, %		29.6
Segment Travel Time, minutes		0.74	Follower Density (FD), followers/mi/ln		1.1
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		243	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.70	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		896
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		243	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		5.79
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.14
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29315	PF Power Coefficient (p)	0.75829
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.3
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	896	-	-	68.0

Vehicle Results			
Average Speed, mi/h	68.0	Percent Followers, %	35.8
Segment Travel Time, minutes	0.15	Follower Density (FD), followers/mi/ln	1.3
Vehicle LOS	A		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	243	Bicycle Effective Width, ft	24
Bicycle LOS Score	3.70	Bicycle Effective Speed Factor	5.07
Bicycle LOS	D		

Segment 7

Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	743
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	243	Opposing Demand Flow Rate, veh/h	169
Peak Hour Factor	0.88	Total Trucks, %	5.79
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.14

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.30713	Speed Power Coefficient (p)	0.54838
PF Slope Coefficient (m)	-1.23090	PF Power Coefficient (p)	0.80942
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.2
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	743	-	-	68.5

Vehicle Results			
Average Speed, mi/h	68.5	Percent Followers, %	32.4
Segment Travel Time, minutes	0.12	Follower Density (FD), followers/mi/ln	1.2
Vehicle LOS	A		

Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		243	Bicycle Effective Width, ft		24
Bicycle LOS Score		3.70	Bicycle Effective Speed Factor		5.07
Bicycle LOS		D			
Segment 8					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		2717
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		245	Opposing Demand Flow Rate, veh/h		165
Peak Hour Factor		0.88	Total Trucks, %		3.28
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.14
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.32768	Speed Power Coefficient (p)		0.54983
PF Slope Coefficient (m)		-1.17918	PF Power Coefficient (p)		0.83165
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2717	-	-	68.5
Vehicle Results					
Average Speed, mi/h		68.5	Percent Followers, %		30.7
Segment Travel Time, minutes		0.45	Follower Density (FD), followers/mi/ln		1.1
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		245	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.93	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 9					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1013
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					

Directional Demand Flow Rate, veh/h		245	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		3.28
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.14
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29345	PF Power Coefficient (p)		0.75792
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1013	-	-	68.0
Vehicle Results					
Average Speed, mi/h		68.0	Percent Followers, %		36.0
Segment Travel Time, minutes		0.17	Follower Density (FD), followers/mi/ln		1.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		245	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.93	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		4569
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		245	Opposing Demand Flow Rate, veh/h		165
Peak Hour Factor		0.88	Total Trucks, %		3.28
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.14
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.34958	Speed Power Coefficient (p)		0.54983
PF Slope Coefficient (m)		-1.14981	PF Power Coefficient (p)		0.84100
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	4569	-	-	68.5
Vehicle Results					
Average Speed, mi/h		68.5	Percent Followers, %		29.7
Segment Travel Time, minutes		0.76	Follower Density (FD), followers/mi/ln		1.1
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		245	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.93	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		5676
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		244	Opposing Demand Flow Rate, veh/h		165
Peak Hour Factor		0.88	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.14
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.36055	Speed Power Coefficient (p)		0.54983
PF Slope Coefficient (m)		-1.14222	PF Power Coefficient (p)		0.84066
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5676	-	-	68.5
Vehicle Results					
Average Speed, mi/h		68.5	Percent Followers, %		29.5
Segment Travel Time, minutes		0.94	Follower Density (FD), followers/mi/ln		1.1
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		244	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.80	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 12					

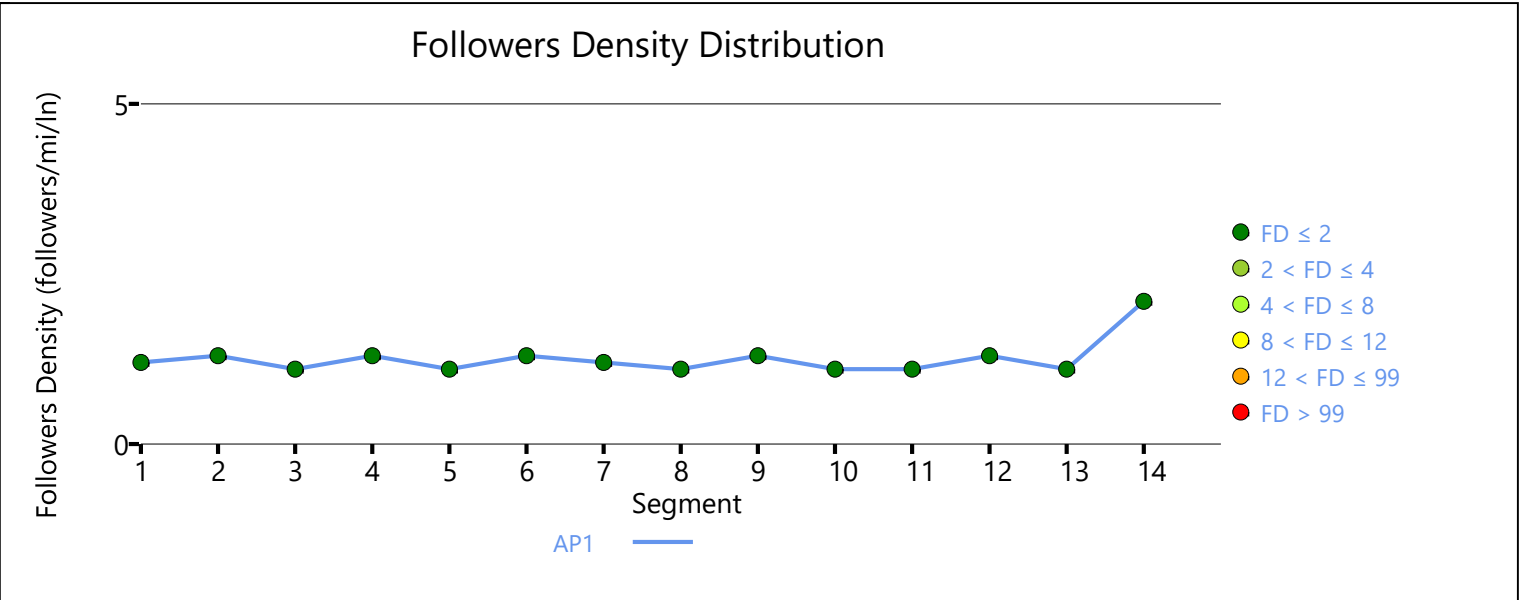
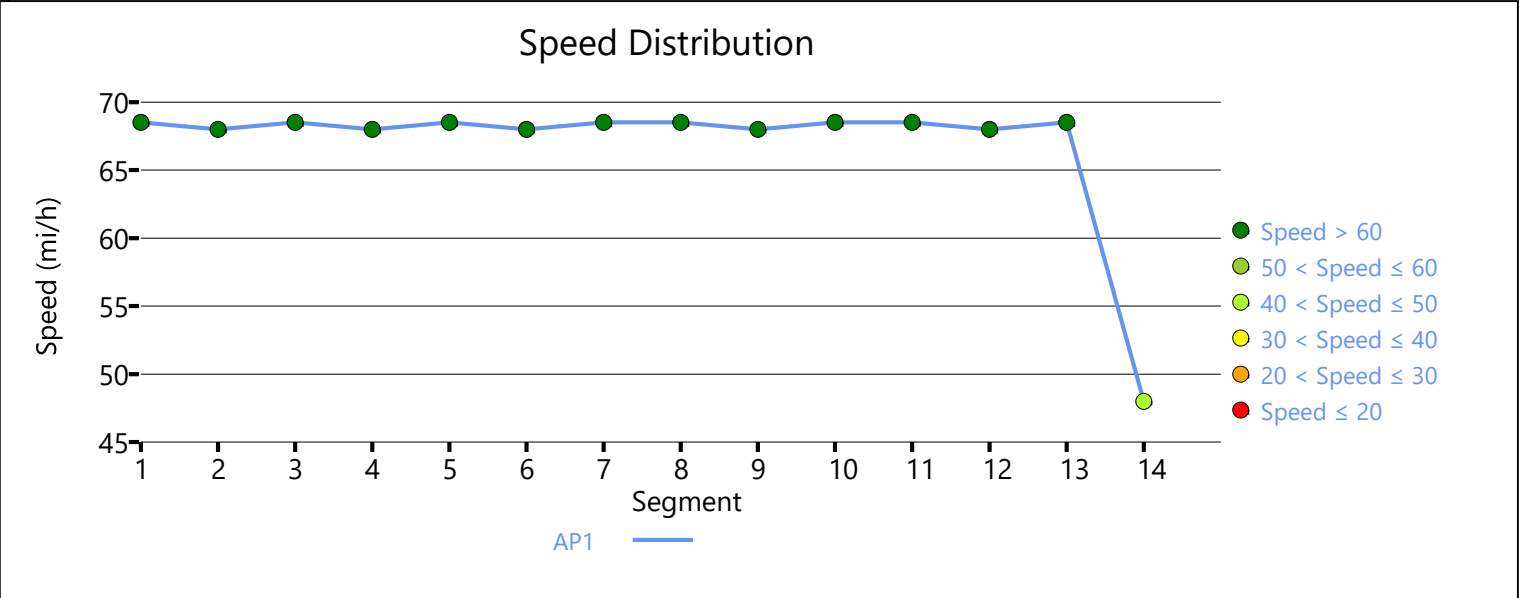
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		657
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		244	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.14
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29350	PF Power Coefficient (p)		0.75785
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.3
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	657	-	-	68.0
Vehicle Results					
Average Speed, mi/h		68.0	Percent Followers, %		35.9
Segment Travel Time, minutes		0.11	Follower Density (FD), followers/mi/ln		1.3
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		244	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.80	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		6009
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		244	Opposing Demand Flow Rate, veh/h		165
Peak Hour Factor		0.88	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.14
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.36364	Speed Power Coefficient (p)		0.54983
PF Slope Coefficient (m)		-1.14089	PF Power Coefficient (p)		0.83997

In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	6009	-	-	68.5
Vehicle Results					
Average Speed, mi/h		68.5	Percent Followers, %		29.5
Segment Travel Time, minutes		1.00	Follower Density (FD), followers/mi/ln		1.1
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		244	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.80	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 14					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		891
Measured FFS		Measured	Free-Flow Speed, mi/h		50.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		244	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.14
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		50.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.47375	PF Power Coefficient (p)		0.71164
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		2.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	891	-	-	48.0
Vehicle Results					
Average Speed, mi/h		48.0	Percent Followers, %		41.8
Segment Travel Time, minutes		0.21	Follower Density (FD), followers/mi/ln		2.1
Vehicle LOS		B			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4

Flow Rate Outside Lane, veh/h	244	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.59	Bicycle Effective Speed Factor	4.42
Bicycle LOS	C		

Facility Results				
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	327	0.11	1.1	A



HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	5/11/2023
Agency	HRG	Analysis Year	2050 NB
Jurisdiction	SDDOT	Time Analyzed	PM Peak
Project Description	West of Hartford SD 38 EB	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	1069
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	157	Opposing Demand Flow Rate, veh/h	286
Peak Hour Factor	0.88	Total Trucks, %	5.79
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.09

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.34767	Speed Power Coefficient (p)	0.51808
PF Slope Coefficient (m)	-1.25475	PF Power Coefficient (p)	0.80124
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.6
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1069	-	-	69.0

Vehicle Results

Average Speed, mi/h	69.0	Percent Followers, %	24.8
Segment Travel Time, minutes	0.18	Follower Density (FD), followers/mi/ln	0.6
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	157	Bicycle Effective Width, ft	30
Bicycle LOS Score	1.86	Bicycle Effective Speed Factor	5.07
Bicycle LOS	B		

Segment 2

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	664
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		157	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		5.79
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29315	PF Power Coefficient (p)		0.75829
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	664	-	-	68.6
Vehicle Results					
Average Speed, mi/h		68.6	Percent Followers, %		27.2
Segment Travel Time, minutes		0.11	Follower Density (FD), followers/mi/ln		0.6
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		157	Bicycle Effective Width, ft		30
Bicycle LOS Score		1.86	Bicycle Effective Speed Factor		5.07
Bicycle LOS		B			
Segment 3					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1871
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		157	Opposing Demand Flow Rate, veh/h		286
Peak Hour Factor		0.88	Total Trucks, %		5.79
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.35747	Speed Power Coefficient (p)		0.51808
PF Slope Coefficient (m)		-1.22915	PF Power Coefficient (p)		0.81213
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1871	-	-	69.0

Vehicle Results

Average Speed, mi/h	69.0	Percent Followers, %	23.9
Segment Travel Time, minutes	0.31	Follower Density (FD), followers/mi/ln	0.5
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	157	Bicycle Effective Width, ft	30
Bicycle LOS Score	1.86	Bicycle Effective Speed Factor	5.07
Bicycle LOS	B		

Segment 4

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	925
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	157	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	5.79
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.09

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29315	PF Power Coefficient (p)	0.75829
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.6
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	925	-	-	68.6

Vehicle Results

Average Speed, mi/h	68.6	Percent Followers, %	27.2
Segment Travel Time, minutes	0.15	Follower Density (FD), followers/mi/ln	0.6
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	157	Bicycle Effective Width, ft	30
Bicycle LOS Score	1.86	Bicycle Effective Speed Factor	5.07
Bicycle LOS	B		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		4476
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		157	Opposing Demand Flow Rate, veh/h		286
Peak Hour Factor		0.88	Total Trucks, %		5.79
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.39096	Speed Power Coefficient (p)		0.51808
PF Slope Coefficient (m)		-1.17364	PF Power Coefficient (p)		0.83159
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	4476	-	-	69.0
Vehicle Results					
Average Speed, mi/h		69.0	Percent Followers, %		22.2
Segment Travel Time, minutes		0.74	Follower Density (FD), followers/mi/ln		0.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		157	Bicycle Effective Width, ft		30
Bicycle LOS Score		1.86	Bicycle Effective Speed Factor		5.07
Bicycle LOS		B			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		896
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		157	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		5.79
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.09
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29315	PF Power Coefficient (p)	0.75829
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.6
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	896	-	-	68.6

Vehicle Results			
Average Speed, mi/h	68.6	Percent Followers, %	27.2
Segment Travel Time, minutes	0.15	Follower Density (FD), followers/mi/ln	0.6
Vehicle LOS	A		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	157	Bicycle Effective Width, ft	30
Bicycle LOS Score	1.86	Bicycle Effective Speed Factor	5.07
Bicycle LOS	B		

Segment 7

Vehicle Inputs			
Segment Type	Passing Zone	Length, ft	743
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	157	Opposing Demand Flow Rate, veh/h	286
Peak Hour Factor	0.88	Total Trucks, %	5.79
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.09

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.34767	Speed Power Coefficient (p)	0.51808
PF Slope Coefficient (m)	-1.25475	PF Power Coefficient (p)	0.80124
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.6
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	743	-	-	69.0

Vehicle Results			
Average Speed, mi/h	69.0	Percent Followers, %	24.8
Segment Travel Time, minutes	0.12	Follower Density (FD), followers/mi/ln	0.6
Vehicle LOS	A		

Bicycle Results					
Percent Occupied Parking	0	Pavement Condition Rating	4		
Flow Rate Outside Lane, veh/h	157	Bicycle Effective Width, ft	30		
Bicycle LOS Score	1.86	Bicycle Effective Speed Factor	5.07		
Bicycle LOS	B				
Segment 8					
Vehicle Inputs					
Segment Type	Passing Zone	Length, ft	2717		
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0		
Demand and Capacity					
Directional Demand Flow Rate, veh/h	164	Opposing Demand Flow Rate, veh/h	289		
Peak Hour Factor	0.88	Total Trucks, %	3.28		
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.10		
Intermediate Results					
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0		
Speed Slope Coefficient (m)	4.37072	Speed Power Coefficient (p)	0.51760		
PF Slope Coefficient (m)	-1.20338	PF Power Coefficient (p)	0.82225		
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.6		
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0		
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2717	-	-	68.9
Vehicle Results					
Average Speed, mi/h	68.9	Percent Followers, %	23.8		
Segment Travel Time, minutes	0.45	Follower Density (FD), followers/mi/ln	0.6		
Vehicle LOS	A				
Bicycle Results					
Percent Occupied Parking	0	Pavement Condition Rating	4		
Flow Rate Outside Lane, veh/h	164	Bicycle Effective Width, ft	29		
Bicycle LOS Score	1.40	Bicycle Effective Speed Factor	5.07		
Bicycle LOS	A				
Segment 9					
Vehicle Inputs					
Segment Type	Passing Constrained	Length, ft	1013		
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0		
Demand and Capacity					

Directional Demand Flow Rate, veh/h		164	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		3.28
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29345	PF Power Coefficient (p)		0.75792
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1013	-	-	68.5
Vehicle Results					
Average Speed, mi/h		68.5	Percent Followers, %		28.0
Segment Travel Time, minutes		0.17	Follower Density (FD), followers/mi/ln		0.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		164	Bicycle Effective Width, ft		29
Bicycle LOS Score		1.40	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		4569
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		164	Opposing Demand Flow Rate, veh/h		289
Peak Hour Factor		0.88	Total Trucks, %		3.28
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.39263	Speed Power Coefficient (p)		0.51760
PF Slope Coefficient (m)		-1.17332	PF Power Coefficient (p)		0.83118
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	4569	-	-	68.9
Vehicle Results					
Average Speed, mi/h		68.9	Percent Followers, %		22.9
Segment Travel Time, minutes		0.75	Follower Density (FD), followers/mi/ln		0.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		164	Bicycle Effective Width, ft		29
Bicycle LOS Score		1.40	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		5676
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		164	Opposing Demand Flow Rate, veh/h		280
Peak Hour Factor		0.88	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.40080	Speed Power Coefficient (p)		0.51956
PF Slope Coefficient (m)		-1.16417	PF Power Coefficient (p)		0.83135
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	5676	-	-	68.9
Vehicle Results					
Average Speed, mi/h		68.9	Percent Followers, %		22.8
Segment Travel Time, minutes		0.94	Follower Density (FD), followers/mi/ln		0.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		164	Bicycle Effective Width, ft		29
Bicycle LOS Score		1.28	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 12					

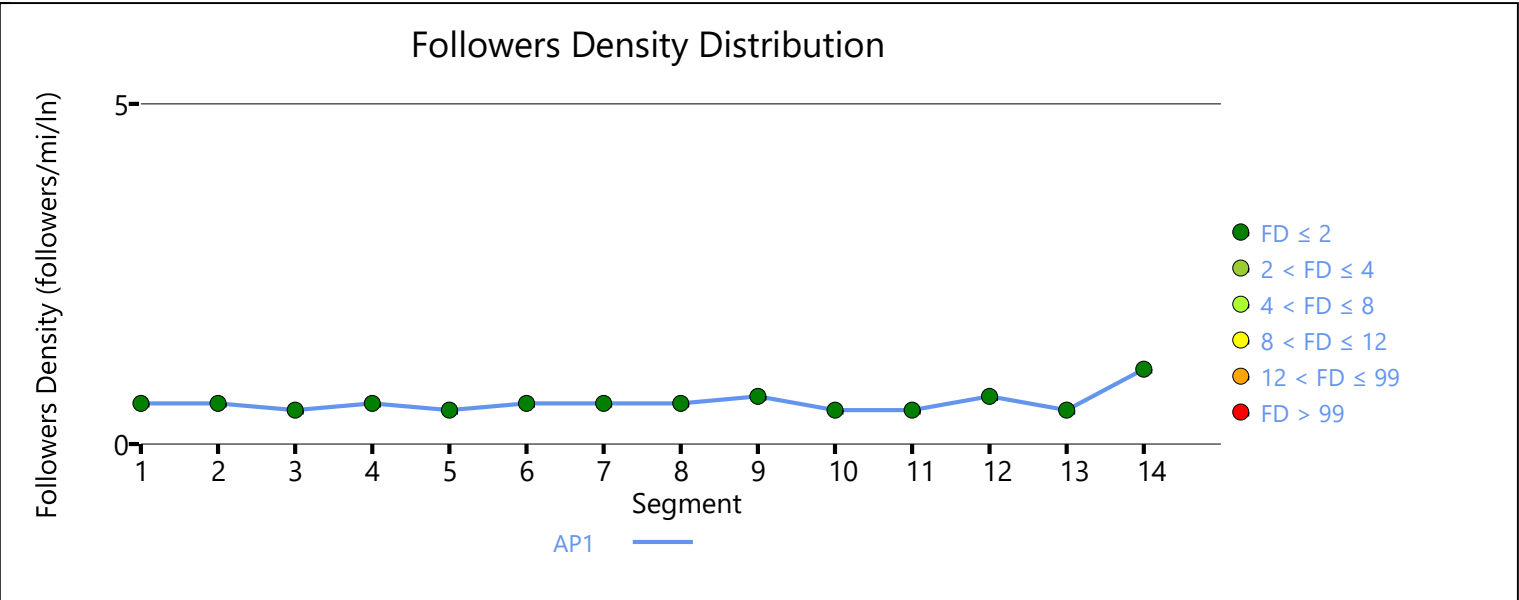
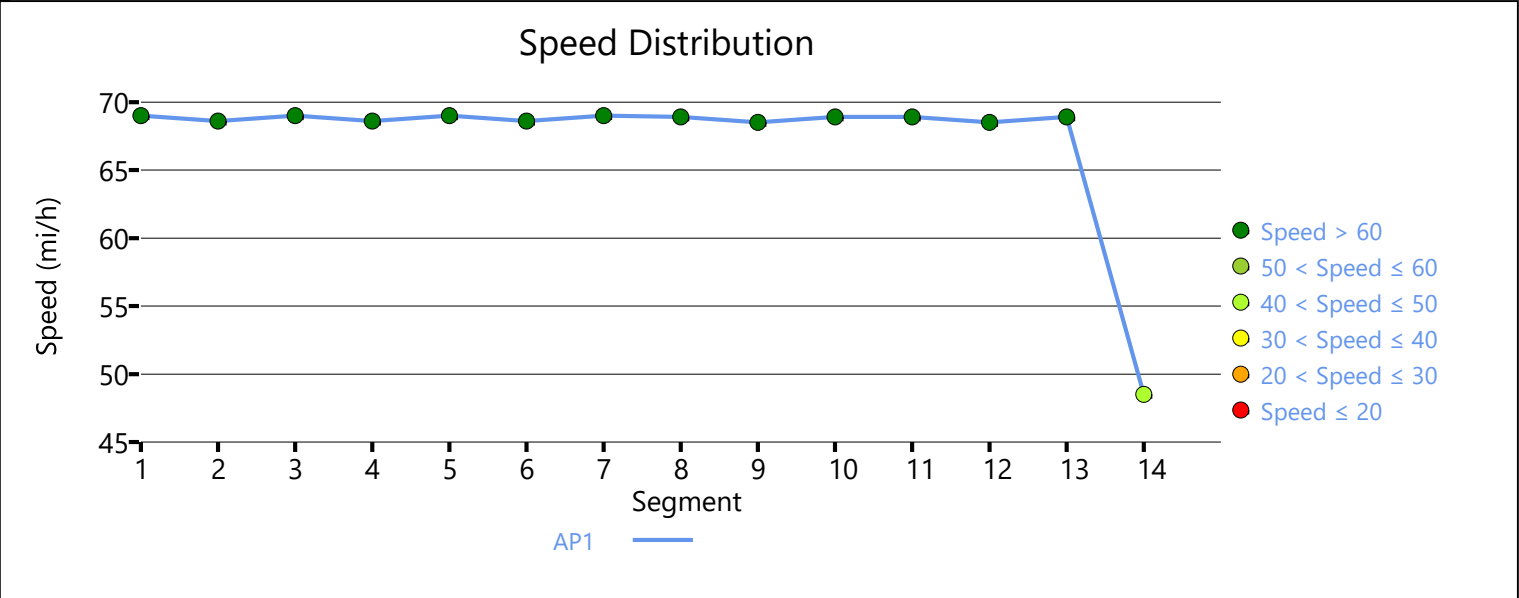
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		657
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		164	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29350	PF Power Coefficient (p)		0.75785
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	657	-	-	68.5
Vehicle Results					
Average Speed, mi/h		68.5	Percent Followers, %		28.0
Segment Travel Time, minutes		0.11	Follower Density (FD), followers/mi/ln		0.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		164	Bicycle Effective Width, ft		29
Bicycle LOS Score		1.28	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		6009
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		164	Opposing Demand Flow Rate, veh/h		280
Peak Hour Factor		0.88	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.40389	Speed Power Coefficient (p)		0.51956
PF Slope Coefficient (m)		-1.16281	PF Power Coefficient (p)		0.83065

In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	6009	-	-	68.9
Vehicle Results					
Average Speed, mi/h		68.9	Percent Followers, %		22.8
Segment Travel Time, minutes		0.99	Follower Density (FD), followers/mi/ln		0.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		164	Bicycle Effective Width, ft		29
Bicycle LOS Score		1.28	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 14					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		891
Measured FFS		Measured	Free-Flow Speed, mi/h		50.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		164	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.82
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		50.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.47375	PF Power Coefficient (p)		0.71164
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.1
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	891	-	-	48.5
Vehicle Results					
Average Speed, mi/h		48.5	Percent Followers, %		33.4
Segment Travel Time, minutes		0.21	Follower Density (FD), followers/mi/ln		1.1
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4

Flow Rate Outside Lane, veh/h	164	Bicycle Effective Width, ft	29
Bicycle LOS Score	1.06	Bicycle Effective Speed Factor	4.42
Bicycle LOS	A		

Facility Results				
T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	216	0.05	0.6	A



HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	5/11/2023
Agency	HRG	Analysis Year	2050 NB
Jurisdiction	SDDOT	Time Analyzed	AM Peak
Project Description	WB 38 West of Hartford	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	10549
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	165	Opposing Demand Flow Rate, veh/h	244
Peak Hour Factor	0.88	Total Trucks, %	12.50
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.10

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.42827	Speed Power Coefficient (p)	0.52768
PF Slope Coefficient (m)	-1.16689	PF Power Coefficient (p)	0.80729
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.6
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	10549	-	-	69.0

Vehicle Results

Average Speed, mi/h	69.0	Percent Followers, %	23.8
Segment Travel Time, minutes	1.74	Follower Density (FD), followers/mi/ln	0.6
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	165	Bicycle Effective Width, ft	29
Bicycle LOS Score	4.94	Bicycle Effective Speed Factor	5.07
Bicycle LOS	E		

Segment 2

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	2793
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		165	Opposing Demand Flow Rate, veh/h		244
Peak Hour Factor		0.88	Total Trucks, %		12.50
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.35767	Speed Power Coefficient (p)		0.52768
PF Slope Coefficient (m)		-1.19319	PF Power Coefficient (p)		0.82737
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2793	-	-	69.0
Vehicle Results					
Average Speed, mi/h		69.0	Percent Followers, %		23.5
Segment Travel Time, minutes		0.46	Follower Density (FD), followers/mi/ln		0.6
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		165	Bicycle Effective Width, ft		29
Bicycle LOS Score		4.94	Bicycle Effective Speed Factor		5.07
Bicycle LOS		E			
Segment 3					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		3825
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		165	Opposing Demand Flow Rate, veh/h		245
Peak Hour Factor		0.88	Total Trucks, %		2.40
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.37079	Speed Power Coefficient (p)		0.52741
PF Slope Coefficient (m)		-1.17529	PF Power Coefficient (p)		0.83222
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3825	-	-	69.0

Vehicle Results

Average Speed, mi/h	69.0	Percent Followers, %	23.1
Segment Travel Time, minutes	0.63	Follower Density (FD), followers/mi/ln	0.6
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	165	Bicycle Effective Width, ft	29
Bicycle LOS Score	1.17	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 4

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	791
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	165	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	2.40
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.10

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29355	PF Power Coefficient (p)	0.75779
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.7
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	791	-	-	68.5

Vehicle Results

Average Speed, mi/h	68.5	Percent Followers, %	28.1
Segment Travel Time, minutes	0.13	Follower Density (FD), followers/mi/ln	0.7
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	165	Bicycle Effective Width, ft	29
Bicycle LOS Score	1.17	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		3414
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		165	Opposing Demand Flow Rate, veh/h		245
Peak Hour Factor		0.88	Total Trucks, %		2.40
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.36595	Speed Power Coefficient (p)		0.52741
PF Slope Coefficient (m)		-1.18179	PF Power Coefficient (p)		0.83026
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3414	-	-	69.0
Vehicle Results					
Average Speed, mi/h		69.0	Percent Followers, %		23.2
Segment Travel Time, minutes		0.56	Follower Density (FD), followers/mi/ln		0.6
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		165	Bicycle Effective Width, ft		29
Bicycle LOS Score		1.17	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		286
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		165	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.40
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29355	PF Power Coefficient (p)	0.75779
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.7
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	286	-	-	68.5

Vehicle Results			
Average Speed, mi/h	68.5	Percent Followers, %	28.1
Segment Travel Time, minutes	0.05	Follower Density (FD), followers/mi/ln	0.7
Vehicle LOS	A		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	165	Bicycle Effective Width, ft	29
Bicycle LOS Score	1.17	Bicycle Effective Speed Factor	5.07
Bicycle LOS	A		

Segment 7

Vehicle Inputs			
Segment Type	Passing Constrained	Length, ft	463
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	169	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	2.60
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.10

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29353	PF Power Coefficient (p)	0.75782
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.7
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	463	-	-	68.5

Vehicle Results			
Average Speed, mi/h	68.5	Percent Followers, %	28.6
Segment Travel Time, minutes	0.08	Follower Density (FD), followers/mi/ln	0.7
Vehicle LOS	A		

Bicycle Results					
Percent Occupied Parking	0	Pavement Condition Rating	4		
Flow Rate Outside Lane, veh/h	169	Bicycle Effective Width, ft	29		
Bicycle LOS Score	1.23	Bicycle Effective Speed Factor	5.07		
Bicycle LOS	A				
Segment 8					
Vehicle Inputs					
Segment Type	Passing Zone	Length, ft	4822		
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0		
Demand and Capacity					
Directional Demand Flow Rate, veh/h	169	Opposing Demand Flow Rate, veh/h	243		
Peak Hour Factor	0.88	Total Trucks, %	2.60		
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.10		
Intermediate Results					
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0		
Speed Slope Coefficient (m)	4.38079	Speed Power Coefficient (p)	0.52796		
PF Slope Coefficient (m)	-1.16377	PF Power Coefficient (p)	0.83451		
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.6		
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0		
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	4822	-	-	68.9
Vehicle Results					
Average Speed, mi/h	68.9	Percent Followers, %	23.2		
Segment Travel Time, minutes	0.79	Follower Density (FD), followers/mi/ln	0.6		
Vehicle LOS	A				
Bicycle Results					
Percent Occupied Parking	0	Pavement Condition Rating	4		
Flow Rate Outside Lane, veh/h	169	Bicycle Effective Width, ft	29		
Bicycle LOS Score	1.23	Bicycle Effective Speed Factor	5.07		
Bicycle LOS	A				
Segment 9					
Vehicle Inputs					
Segment Type	Passing Constrained	Length, ft	861		
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0		
Demand and Capacity					

Directional Demand Flow Rate, veh/h		169	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.60
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29353	PF Power Coefficient (p)		0.75782
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	861	-	-	68.5
Vehicle Results					
Average Speed, mi/h		68.5	Percent Followers, %		28.6
Segment Travel Time, minutes		0.14	Follower Density (FD), followers/mi/ln		0.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		169	Bicycle Effective Width, ft		29
Bicycle LOS Score		1.23	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1556
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		169	Opposing Demand Flow Rate, veh/h		243
Peak Hour Factor		0.88	Total Trucks, %		2.60
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.33831	Speed Power Coefficient (p)		0.52796
PF Slope Coefficient (m)		-1.23554	PF Power Coefficient (p)		0.80871
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	1556	-	-	68.9
Vehicle Results					
Average Speed, mi/h		68.9	Percent Followers, %		25.5
Segment Travel Time, minutes		0.26	Follower Density (FD), followers/mi/ln		0.6
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		169	Bicycle Effective Width, ft		29
Bicycle LOS Score		1.23	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		799
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		169	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.60
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29353	PF Power Coefficient (p)		0.75782
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	799	-	-	68.5
Vehicle Results					
Average Speed, mi/h		68.5	Percent Followers, %		28.6
Segment Travel Time, minutes		0.13	Follower Density (FD), followers/mi/ln		0.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		169	Bicycle Effective Width, ft		29
Bicycle LOS Score		1.23	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 12					

Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		857
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		169	Opposing Demand Flow Rate, veh/h		243
Peak Hour Factor		0.88	Total Trucks, %		2.60
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.33390	Speed Power Coefficient (p)		0.52796
PF Slope Coefficient (m)		-1.24754	PF Power Coefficient (p)		0.80350
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		0.6
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	857	-	-	68.9
Vehicle Results					
Average Speed, mi/h		68.9	Percent Followers, %		25.9
Segment Travel Time, minutes		0.14	Follower Density (FD), followers/mi/ln		0.6
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		169	Bicycle Effective Width, ft		29
Bicycle LOS Score		1.23	Bicycle Effective Speed Factor		5.07
Bicycle LOS		A			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1288
Measured FFS		Measured	Free-Flow Speed, mi/h		60.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		169	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.60
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.10
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		60.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.39677	PF Power Coefficient (p)		0.73640

In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	0.9
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1288	-	-	58.5

Vehicle Results

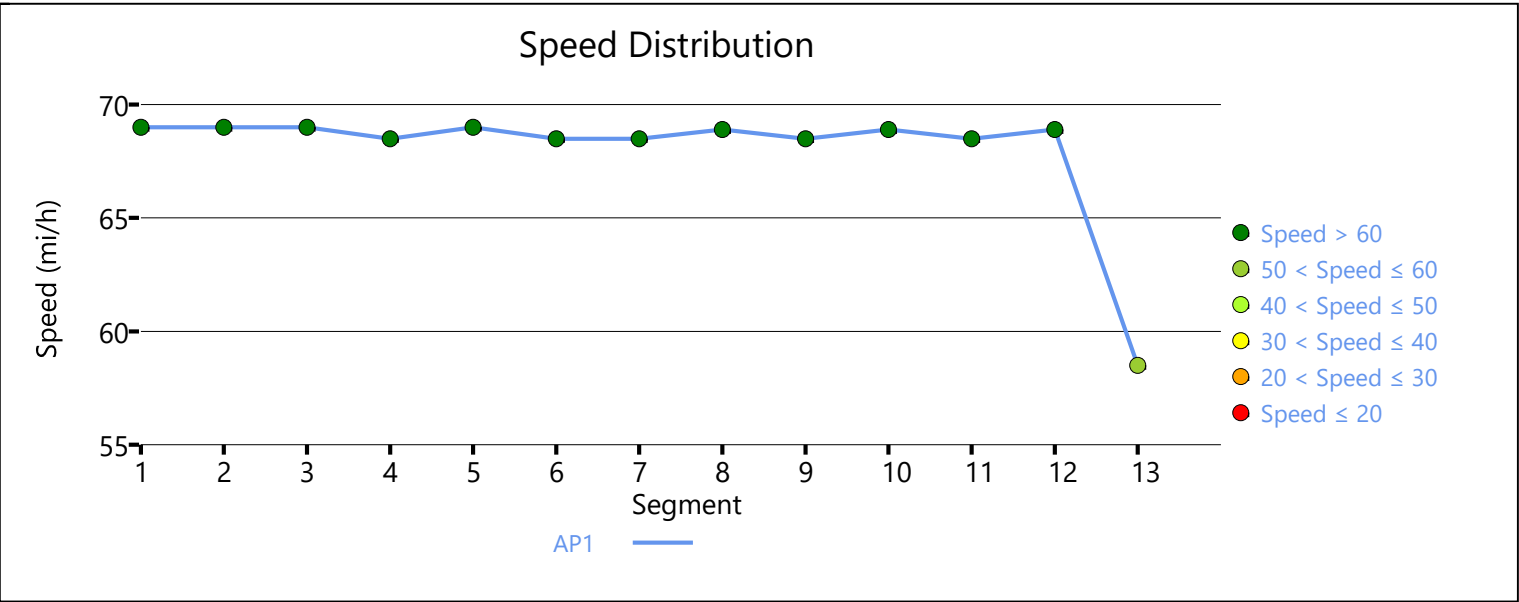
Average Speed, mi/h	58.5	Percent Followers, %	31.5
Segment Travel Time, minutes	0.25	Follower Density (FD), followers/mi/ln	0.9
Vehicle LOS	A		

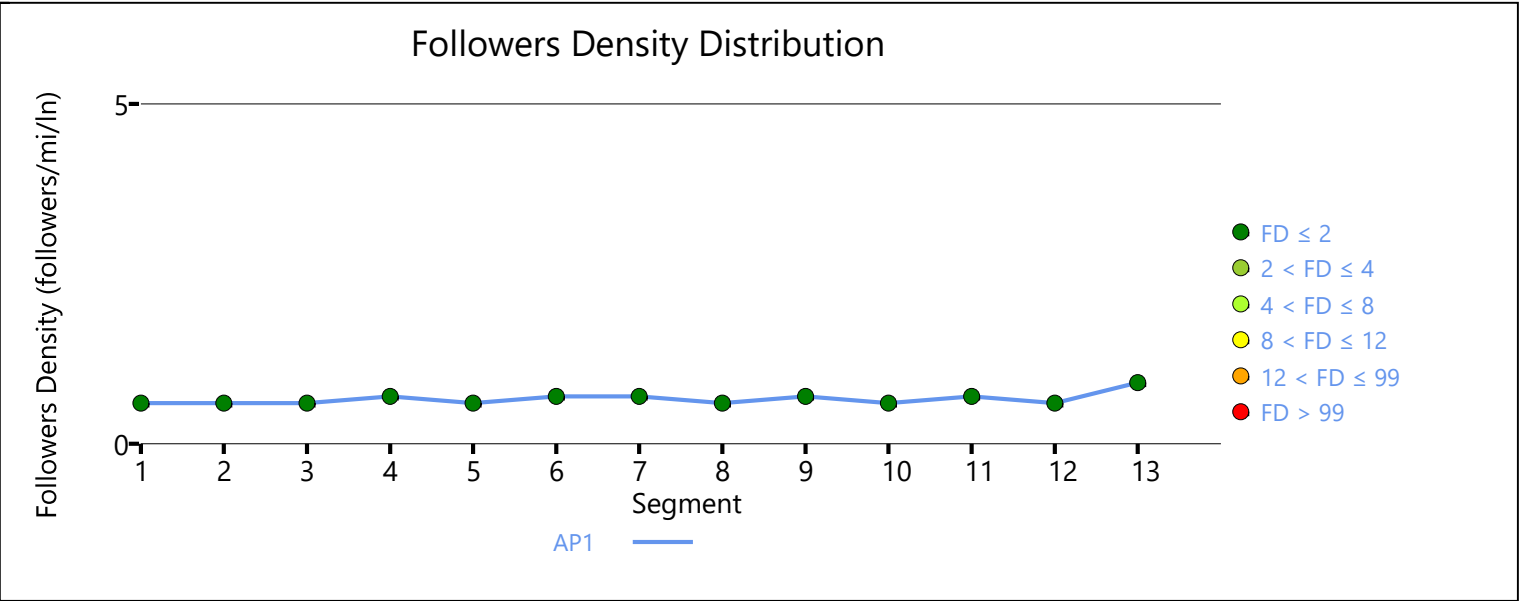
Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	169	Bicycle Effective Width, ft	29
Bicycle LOS Score	1.14	Bicycle Effective Speed Factor	4.79
Bicycle LOS	A		

Facility Results

T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	224	0.05	0.6	A





HCS Two-Lane Highway Report

Project Information

Analyst	MJV	Date	5/11/2023
Agency	HRG	Analysis Year	2050 NB
Jurisdiction	SDDOT	Time Analyzed	PM Peak
Project Description	WB 38 West of Hartford	Units	U.S. Customary

Segment 1

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	10549
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	280	Opposing Demand Flow Rate, veh/h	164
Peak Hour Factor	0.88	Total Trucks, %	1.94
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.16

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.39885	Speed Power Coefficient (p)	0.55020
PF Slope Coefficient (m)	-1.15143	PF Power Coefficient (p)	0.81244
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.4
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	10549	-	-	68.3

Vehicle Results

Average Speed, mi/h	68.3	Percent Followers, %	33.6
Segment Travel Time, minutes	1.76	Follower Density (FD), followers/mi/ln	1.4
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	280	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.64	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 2

Vehicle Inputs

Segment Type	Passing Zone	Length, ft	2793
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity					
Directional Demand Flow Rate, veh/h		280	Opposing Demand Flow Rate, veh/h		164
Peak Hour Factor		0.88	Total Trucks, %		1.94
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.16
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.32824	Speed Power Coefficient (p)		0.55020
PF Slope Coefficient (m)		-1.17723	PF Power Coefficient (p)		0.83227
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	2793	-	-	68.3
Vehicle Results					
Average Speed, mi/h		68.3	Percent Followers, %		33.5
Segment Travel Time, minutes		0.46	Follower Density (FD), followers/mi/ln		1.4
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		280	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.64	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 3					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		3825
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		289	Opposing Demand Flow Rate, veh/h		164
Peak Hour Factor		0.88	Total Trucks, %		2.19
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.17
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.34098	Speed Power Coefficient (p)		0.55020
PF Slope Coefficient (m)		-1.15833	PF Power Coefficient (p)		0.83897
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3825	-	-	68.3

Vehicle Results

Average Speed, mi/h	68.3	Percent Followers, %	33.5
Segment Travel Time, minutes	0.64	Follower Density (FD), followers/mi/ln	1.4
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	289	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.72	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 4

Vehicle Inputs

Segment Type	Passing Constrained	Length, ft	791
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity

Directional Demand Flow Rate, veh/h	289	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	2.19
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.17

Intermediate Results

Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29358	PF Power Coefficient (p)	0.75776
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.7
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	791	-	-	67.7

Vehicle Results

Average Speed, mi/h	67.7	Percent Followers, %	39.6
Segment Travel Time, minutes	0.13	Follower Density (FD), followers/mi/ln	1.7
Vehicle LOS	A		

Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	289	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.72	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 5					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		3414
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		289	Opposing Demand Flow Rate, veh/h		164
Peak Hour Factor		0.88	Total Trucks, %		2.19
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.17
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.33614	Speed Power Coefficient (p)		0.55020
PF Slope Coefficient (m)		-1.16472	PF Power Coefficient (p)		0.83695
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.4
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	3414	-	-	68.3
Vehicle Results					
Average Speed, mi/h		68.3	Percent Followers, %		33.7
Segment Travel Time, minutes		0.57	Follower Density (FD), followers/mi/ln		1.4
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		289	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.72	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 6					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		286
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		289	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		2.19
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.17
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0

Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29358	PF Power Coefficient (p)	0.75776
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.7
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	286	-	-	67.7

Vehicle Results			
Average Speed, mi/h	67.7	Percent Followers, %	39.6
Segment Travel Time, minutes	0.05	Follower Density (FD), followers/mi/ln	1.7
Vehicle LOS	A		

Bicycle Results			
Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	289	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.72	Bicycle Effective Speed Factor	5.07
Bicycle LOS	C		

Segment 7

Vehicle Inputs			
Segment Type	Passing Constrained	Length, ft	463
Measured FFS	Measured	Free-Flow Speed, mi/h	70.0

Demand and Capacity			
Directional Demand Flow Rate, veh/h	286	Opposing Demand Flow Rate, veh/h	-
Peak Hour Factor	0.88	Total Trucks, %	3.08
Segment Capacity, veh/h	1700	Demand/Capacity (D/C)	0.17

Intermediate Results			
Segment Vertical Class	1	Free-Flow Speed, mi/h	70.0
Speed Slope Coefficient (m)	4.57372	Speed Power Coefficient (p)	0.41674
PF Slope Coefficient (m)	-1.29347	PF Power Coefficient (p)	0.75789
In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	1.7
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	463	-	-	67.7

Vehicle Results			
Average Speed, mi/h	67.7	Percent Followers, %	39.4
Segment Travel Time, minutes	0.08	Follower Density (FD), followers/mi/ln	1.7
Vehicle LOS	A		

Bicycle Results											
Percent Occupied Parking		0		Pavement Condition Rating		4					
Flow Rate Outside Lane, veh/h		286		Bicycle Effective Width, ft		24					
Bicycle LOS Score		2.95		Bicycle Effective Speed Factor		5.07					
Bicycle LOS		C									
Segment 8											
Vehicle Inputs											
Segment Type		Passing Zone		Length, ft		4822					
Measured FFS		Measured		Free-Flow Speed, mi/h		70.0					
Demand and Capacity											
Directional Demand Flow Rate, veh/h		286		Opposing Demand Flow Rate, veh/h		157					
Peak Hour Factor		0.88		Total Trucks, %		3.08					
Segment Capacity, veh/h		1700		Demand/Capacity (D/C)		0.17					
Intermediate Results											
Segment Vertical Class		1		Free-Flow Speed, mi/h		70.0					
Speed Slope Coefficient (m)		4.34895		Speed Power Coefficient (p)		0.55243					
PF Slope Coefficient (m)		-1.14563		PF Power Coefficient (p)		0.84199					
In Passing Lane Effective Length?		No		Total Segment Density, veh/mi/ln		1.4					
%Improvement to Percent Followers		0.0		%Improvement to Speed		0.0					
Subsegment Data											
#	Segment Type		Length, ft		Radius, ft		Superelevation, %		Average Speed, mi/h		
1	Tangent		4822		-		-		68.3		
Vehicle Results											
Average Speed, mi/h			68.3			Percent Followers, %			33.0		
Segment Travel Time, minutes			0.80			Follower Density (FD), followers/mi/ln			1.4		
Vehicle LOS			A								
Bicycle Results											
Percent Occupied Parking			0			Pavement Condition Rating			4		
Flow Rate Outside Lane, veh/h			286			Bicycle Effective Width, ft			24		
Bicycle LOS Score			2.95			Bicycle Effective Speed Factor			5.07		
Bicycle LOS			C								
Segment 9											
Vehicle Inputs											
Segment Type			Passing Constrained			Length, ft			861		
Measured FFS			Measured			Free-Flow Speed, mi/h			70.0		
Demand and Capacity											

Directional Demand Flow Rate, veh/h		286	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		3.08
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.17
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29347	PF Power Coefficient (p)		0.75789
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	861	-	-	67.7
Vehicle Results					
Average Speed, mi/h		67.7	Percent Followers, %		39.4
Segment Travel Time, minutes		0.14	Follower Density (FD), followers/mi/ln		1.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		286	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.95	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 10					
Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		1556
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		286	Opposing Demand Flow Rate, veh/h		157
Peak Hour Factor		0.88	Total Trucks, %		3.08
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.17
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.30647	Speed Power Coefficient (p)		0.55243
PF Slope Coefficient (m)		-1.21611	PF Power Coefficient (p)		0.81541
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h

1	Tangent	1556	-	-	68.3
Vehicle Results					
Average Speed, mi/h		68.3	Percent Followers, %		35.5
Segment Travel Time, minutes		0.26	Follower Density (FD), followers/mi/ln		1.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		286	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.95	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 11					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		799
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		286	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		3.08
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.17
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.29347	PF Power Coefficient (p)		0.75789
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.7
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	799	-	-	67.7
Vehicle Results					
Average Speed, mi/h		67.7	Percent Followers, %		39.4
Segment Travel Time, minutes		0.13	Follower Density (FD), followers/mi/ln		1.7
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		286	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.95	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 12					

Vehicle Inputs					
Segment Type		Passing Zone	Length, ft		857
Measured FFS		Measured	Free-Flow Speed, mi/h		70.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		286	Opposing Demand Flow Rate, veh/h		157
Peak Hour Factor		0.88	Total Trucks, %		3.08
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.17
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		70.0
Speed Slope Coefficient (m)		4.30206	Speed Power Coefficient (p)		0.55243
PF Slope Coefficient (m)		-1.22789	PF Power Coefficient (p)		0.81007
In Passing Lane Effective Length?		No	Total Segment Density, veh/mi/ln		1.5
%Improvement to Percent Followers		0.0	%Improvement to Speed		0.0
Subsegment Data					
#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	857	-	-	68.3
Vehicle Results					
Average Speed, mi/h		68.3	Percent Followers, %		36.0
Segment Travel Time, minutes		0.14	Follower Density (FD), followers/mi/ln		1.5
Vehicle LOS		A			
Bicycle Results					
Percent Occupied Parking		0	Pavement Condition Rating		4
Flow Rate Outside Lane, veh/h		286	Bicycle Effective Width, ft		24
Bicycle LOS Score		2.95	Bicycle Effective Speed Factor		5.07
Bicycle LOS		C			
Segment 13					
Vehicle Inputs					
Segment Type		Passing Constrained	Length, ft		1288
Measured FFS		Measured	Free-Flow Speed, mi/h		60.0
Demand and Capacity					
Directional Demand Flow Rate, veh/h		286	Opposing Demand Flow Rate, veh/h		-
Peak Hour Factor		0.88	Total Trucks, %		3.08
Segment Capacity, veh/h		1700	Demand/Capacity (D/C)		0.17
Intermediate Results					
Segment Vertical Class		1	Free-Flow Speed, mi/h		60.0
Speed Slope Coefficient (m)		4.57372	Speed Power Coefficient (p)		0.41674
PF Slope Coefficient (m)		-1.39671	PF Power Coefficient (p)		0.73647

In Passing Lane Effective Length?	No	Total Segment Density, veh/mi/ln	2.1
%Improvement to Percent Followers	0.0	%Improvement to Speed	0.0

Subsegment Data

#	Segment Type	Length, ft	Radius, ft	Superelevation, %	Average Speed, mi/h
1	Tangent	1288	-	-	57.7

Vehicle Results

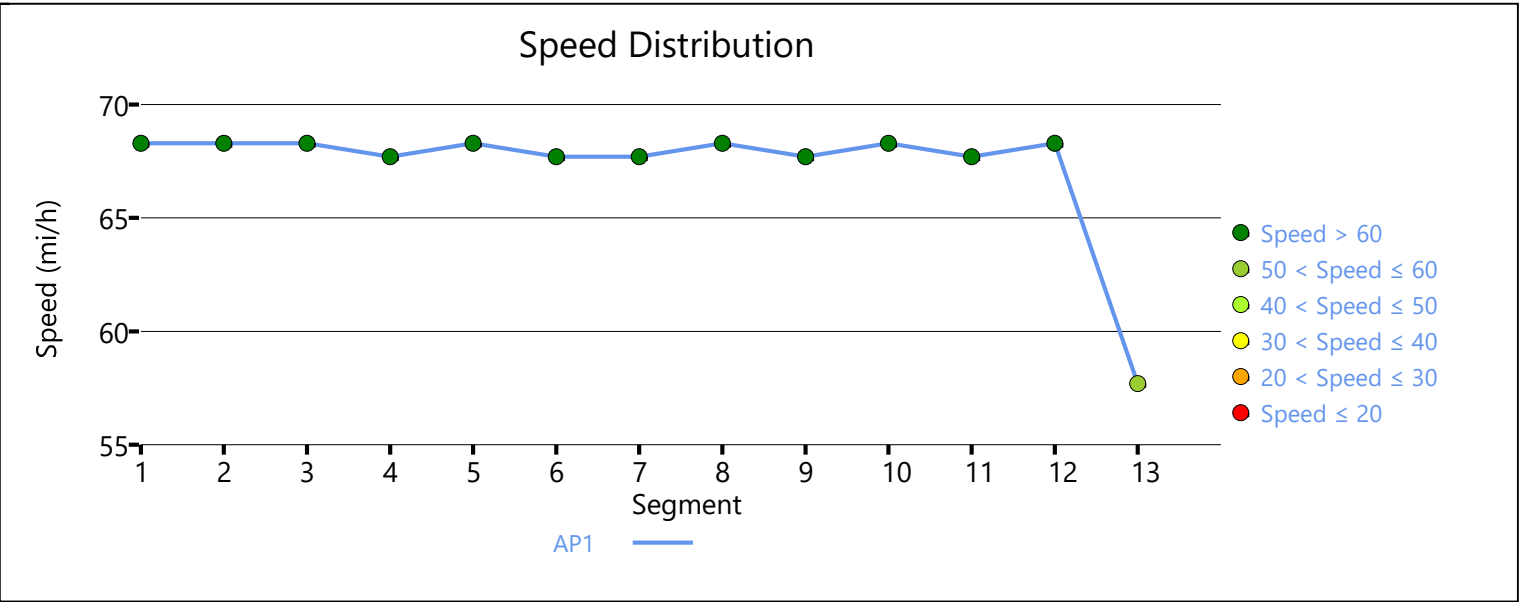
Average Speed, mi/h	57.7	Percent Followers, %	42.7
Segment Travel Time, minutes	0.25	Follower Density (FD), followers/mi/ln	2.1
Vehicle LOS	B		

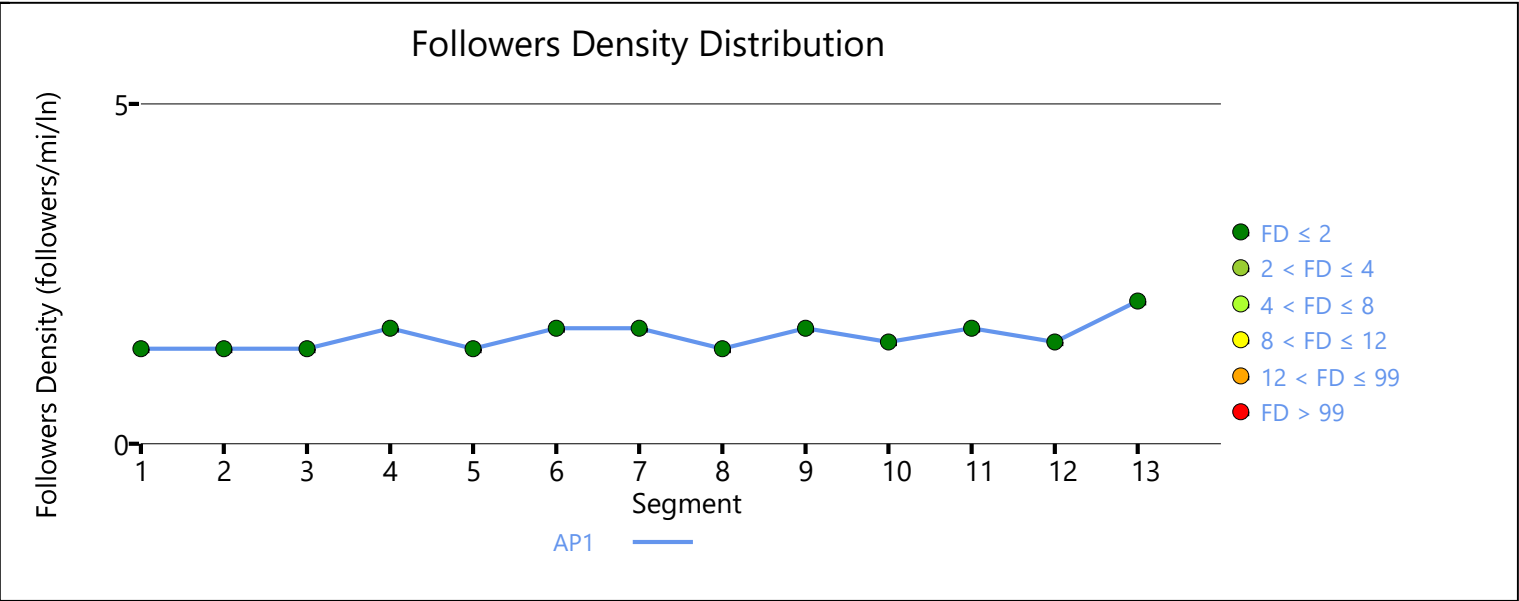
Bicycle Results

Percent Occupied Parking	0	Pavement Condition Rating	4
Flow Rate Outside Lane, veh/h	286	Bicycle Effective Width, ft	24
Bicycle LOS Score	2.86	Bicycle Effective Speed Factor	4.79
Bicycle LOS	C		

Facility Results

T	VMT veh-mi/p	VHD veh-h/p	Follower Density, followers/ mi/ln	LOS
1	382	0.15	1.5	A



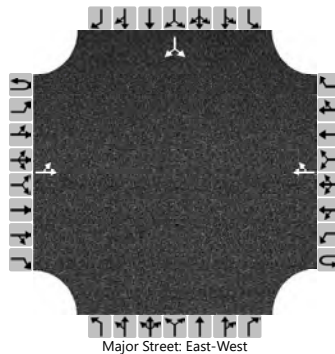


HCS Two-Way Stop-Control Report

General Information

Analyst	CEC	Intersection	SD 38 & I-90 Expressway
Agency/Co.	HRG	Jurisdiction	SDDOT
Date Performed	7/21/2023	East/West Street	SD 38
Analysis Year	2023	North/South Street	I-90 Expressway
Time Analyzed	Event Arrival	Peak Hour Factor	0.79
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	SD 38		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		62	77				96	240						7		0
Percent Heavy Vehicles (%)		2							2					2		2
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)		4.12												6.42		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.52		3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		78													9	
Capacity, c (veh/h)		1134													474	
v/c Ratio		0.07													0.02	
95% Queue Length, Q ₉₅ (veh)		0.2													0.1	
Control Delay (s/veh)		8.4	0.6												12.7	
Level of Service (LOS)		A	A												B	
Approach Delay (s/veh)	4.1												12.7			
Approach LOS	A												B			

HCS Two-Way Stop-Control Report

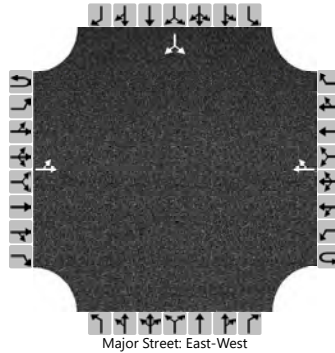
General Information

Analyst	CEC
Agency/Co.	HRG
Date Performed	7/21/2023
Analysis Year	2023
Time Analyzed	Departure
Intersection Orientation	East-West
Project Description	SD 38

Site Information

Intersection	SD 38 & I-90 Expressway
Jurisdiction	SDDOT
East/West Street	SD 38
North/South Street	I-90 Expressway
Peak Hour Factor	0.71
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	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		2	29				5	1						349		135
Percent Heavy Vehicles (%)		2												2		2
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)		4.12												6.42		6.22
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.22												3.52		3.32

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		3													682	
Capacity, c (veh/h)		1612													983	
v/c Ratio		0.00													0.69	
95% Queue Length, Q ₉₅ (veh)		0.0													5.9	
Control Delay (s/veh)		7.2	0.0												16.5	
Level of Service (LOS)		A	A												C	
Approach Delay (s/veh)	0.5												16.5			
Approach LOS	A												C			

APPENDIX B: ENVIRONMENTAL SCREENING REPORT

SD38 Corridor Study



ENVIRONMENTAL SCREENING REPORT

SOUTH DAKOTA SD 38 CORRIDOR STUDY

MINNEHAHA COUNTY, SOUTH DAKOTA

SUBMITTED ON:
November 1, 2024

SUBMITTED TO:



South Dakota Department of Transportation
700 East Broadway Avenue
Pierre, SD 57501



Federal Highway Administration
South Dakota Division
116 East Dakota Avenue, Suite A
Pierre, SD 57501

As consistent with 23 CFR 450

SUBMITTED BY:



Banner Associates
409 22nd Avenue South
Brookings, SD 57006



HR Green
431 North Phillips Avenue, Ste. 400
Sioux Falls, SD 57104

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INTRODUCTION

PROJECT BACKGROUND

The area of interest for the study is the corridor of South Dakota Highway 38 (SD 38) from the east intersection with South Dakota Highway 19 (SD 19) in the Town of Humboldt (Humboldt) to Marion Road in Sioux Falls, Minnehaha County. The South Dakota Department of Transportation (SDDOT) has undertaken this Environmental Screening Report to develop a more thorough understanding of this corridor. The report shall evaluate the existing and projected future operating conditions and features of this corridor with the goal of identifying existing environmental conditions and anticipated problem areas. The results of this effort may ultimately be used to support a National Environmental Policy Act (NEPA) decision and final design.

This Environmental Screening Report identifies environmental resources and environmentally sensitive areas and is composed of readily available data and limited field survey information. The purpose of this screening report is to identify resources early in the planning process to avoid fatal flaws and to consider sensitive environmental resources. The intent of this screening report is not to identify impacts but rather to identify potential resource areas for use in an alternatives analysis to avoid and minimize impacts to resources. As each identified transportation improvement progresses to a specific project, this process can be used to develop alternatives that meet the purpose and need. If a recommended improvement receives funding, the results of the Environmental Screening Report will be carried forward at that time into project development, additional environmental review (NEPA-level or similar local environmental review process), design, and ultimately construction, maintenance, and operations.

The previous planning studies or information that are relevant to the project are noted below in chronological order:

- In 2015, **Sioux Falls Metropolitan Planning Organization (MPO) Bicycle Plan** was completed to consider bike route connections between county roads and the Sioux Falls Metro Area Cities, which includes Brandon, Crooks, Harrisburg, Hartford, Sioux Falls, and Tea.
- In 2015, Minnehaha County adopted the **Envision 2035 Comprehensive Plan** for the purpose of protecting and guiding the physical, social, economic, and environmental development of the county; to protect the tax base; to encourage a distribution of population or mode of land utilization that will facilitate the economical and adequate provisions of transportation, roads, water supply, drainage, sanitation, education, recreation, or other public requirements to lessen governmental expenditure; and to conserve and develop natural resources.
- In 2016, the **Shape Sioux Falls 2040 Comprehensive Plan** was adopted. Updates to this comprehensive plan were completed in 2019 and 2022 to accommodate maps for development areas, sanitary availability, water and roads, drainage and future land uses.
- In 2017, the **Hartford Comprehensive Plan 2017-2037** was completed to accomplish two primary purposes. One to address the planning requirements of state law while also providing a sound and logical basis for city growth and management strategies. Two, to provide some predictability about the potential land uses and timing of development so that both public and private sectors can make informed decisions in the area of real estate and capital investments.
- In 2003, the **Humboldt Comprehensive Plan 2003 – 2025** was completed to accomplish three main goals. The goals with more specific objectives include to ensure the health and safety of citizens, protect natural resources, and enhance the visual quality of the community.
- In 2020, the **Go Sioux Falls Long Range Transportation Plan** was completed to guide transportation planning activities and strategies to shape the greater Sioux Falls region's transportation network.
- Ongoing is the **South Dakota Department of Transportation Pavement Management System** which identified these corridors as needing maintenance.

PROJECT LOCATION

The study focuses on a 14.2-mile stretch of SD 38, an east/west two-lane, rural principal arterial highway. The Project Study Area is in Minnehaha County and extends from the east intersection with SD 19 in Humboldt to Marion Road in Sioux Falls. The SD 38 corridor is shown in **Figure 1**.

The Project Study Area begins at the eastern city limits of Humboldt and continues east through a predominately rural agricultural area with scattered rural residences and farmsteads until reaching the City of Hartford (Hartford). The reach of SD 38 through Hartford is urbanized, with numerous businesses, residences, and intersecting city streets present. The Central Valley Golf Course, West Central High School, and the Hartford Cemetery are also located adjacent to SD 38 within the Hartford city limits. An unnamed tributary of Skunk Creek meanders adjacent to the south side of SD 38 beginning southeast of the intersection of SD 38 and 464th Avenue/Railroad Street in Hartford, eventually connecting to Skunk Creek northwest of the SD 38 and 466th Avenue intersection. East of Hartford, the SD 38 alignment is to the southeast, eventually crossing the Interstate 90 (I-90) corridor at Exit 390 and continuing to the east until reaching Marion Road in Sioux Falls. Between Hartford and Sioux Falls, four smaller residential developments exist: Songbird Acres, Hartford Heights, Maple Pass, and Shatter's Fourth Addition. Aside from these residential developments, the Project Study Area east of Hartford to Sioux Falls is predominately agricultural, with scattered rural residential homes and commercial and industrial businesses. SD 38 crosses the main channel of Skunk Creek approximately 0.5-mile east of the intersection with I-90 and crosses two unnamed tributaries and the main channel of Willow Creek on the eastern end of the Project Study Area. The study segment of SD 38 is predominantly a rural two-lane highway. The vertical profile of the roadway is flat with some rolling terrain, primarily associated with stream drainages. There are a total of eighteen study intersections reviewed as part of the existing conditions assessment, including seventeen stop-controlled intersections and one traffic signal-controlled intersection. Refer to **Table 1**.

Table 1. SD 38 Study Intersections

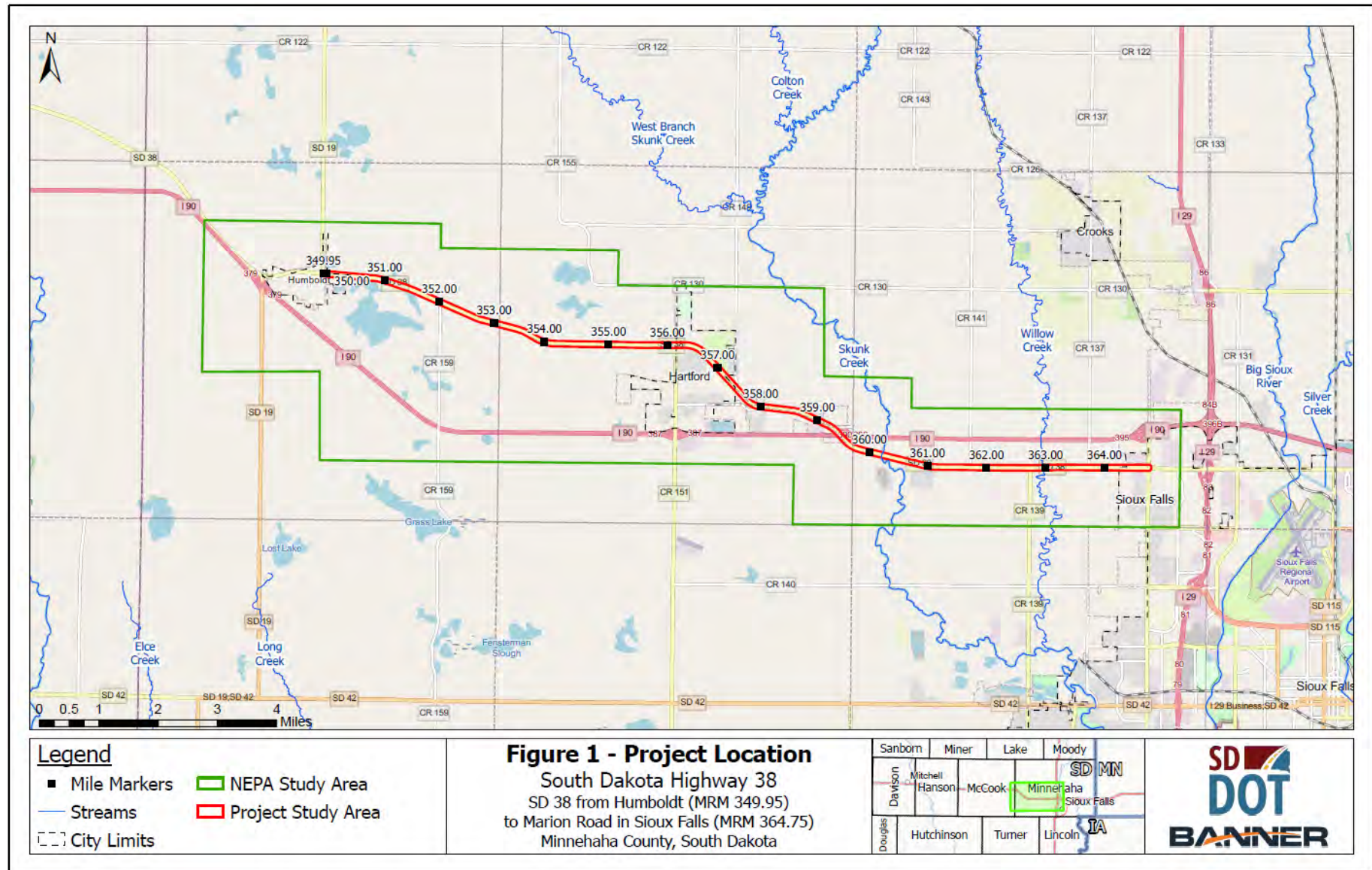
Main Line	Cross Street(s)
SD 38	SD 19 / 457 th Avenue
	459 th Avenue
	I-90 Speedway Entrance
	Western Avenue / 463 rd Avenue
	Main Avenue
	Vandemark Avenue
	2 nd Street
	West Central High School Entrance
	Railroad Street / 464 th Avenue
	Mickelson Road / 260 th Street
	466 ^h Avenue (North)
	Westbound I-90 Exit 390
	Eastbound I-90 Exit 390
	466 th Avenue (South)
	County Highway 141 / 468 th Avenue
	County Highway 139 / 469 th Avenue
	La Mesa Drive / 470 th Avenue
	Marion Road

SD 38 is in a rapidly developing area and serves as a viable alternate route to I-90. Development pressure is expected to impact the SD 38 corridor with higher traffic volumes, greater demand for multi-modal (bike and pedestrian) uses, and additional access management concerns (HR Green 2023a). The eastern portion of the corridor is located within the MPO urban boundary and the growth area of the cities of Sioux Falls, Hartford, and Humboldt. Refer to **Figure 1**.

Two study areas, the NEPA Study Area and the Project Study Area, will be utilized in this screening report to analyze the indirect, direct, and cumulative effects of the proposed transportation improvements. The NEPA Study Area is larger than the Project Study Area and is utilized to analyze the indirect and cumulative effects for resources that extend geographically and are not specifically located within the Project Study Area. The Project Study Area analyzes the direct and indirect effects, allowing for a more specific look at resources such as wetlands or unique habitats that could be potentially affected. The Project Study Area is a 500-foot-wide corridor, 250 feet on either side of the centerline of SD 38. The Project Study Area is specifically utilized for indirect and direct impact analysis.

To determine the boundaries of the NEPA Study Area, traffic data, communities, resource extents, and the needs of the corridor were taken into consideration. The western boundary of the corridor was Humboldt, taking into consideration the connectivity of SD 38 to I-90. The eastern boundary incorporates the connection of SD 38 into Sioux Falls. The northern boundary includes the current and future city limit extents of Hartford and Humboldt. The southern boundary includes the extensions of the two I-90 interchanges and SD 38 entering Sioux Falls. Refer to **Figure 1**.

Figure 1. Project Location



PRELIMINARY NEEDS, PURPOSE, AND GOALS/OBJECTIVES

The Study Advisory Team, composed of FHWA, SDDOT, Minnehaha County, Humboldt, Hartford, Sioux Falls, and the Sioux Falls Metropolitan Planning Organization (MPO), is examining the need for transportation improvements along SD 38 from its intersection with SD 19 to Marion Road.

The logical termini of this study are the east intersection of SD 38 with SD 19 in Humboldt and the intersection of SD 38 with Marion Road in Sioux Falls. This Environmental Screening Report is focused on a corridor level of analysis. Although the needs identified are for the corridor, the needs can be utilized for specific transportation projects identified from this study. The sections below discuss each need that was identified further.

The overall extents of the Project Study Area are from the intersection of SD 38 with SD 19 to the intersection of SD 38 with Marion Road. Within this overall extent, four distinct segments were identified, creating logical termini for future projects. Refer to **Figure 2** in **Appendix A** for corridor segments.

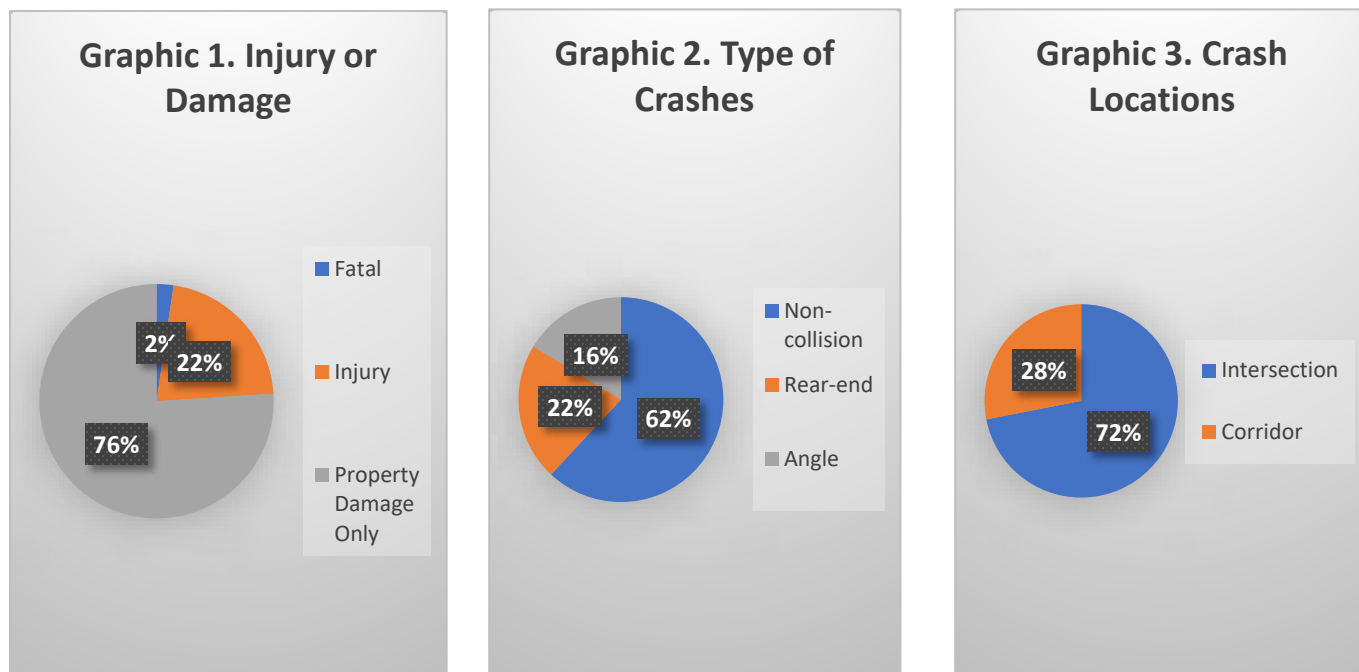
- Segment 1 extends from SD 19 to the western city limit boundary of Hartford. This is a rural segment utilized primarily by through traffic, commuting residents, and agricultural equipment. The through traffic utilizes this segment to travel between Humboldt and Hartford and to continue east or west on SD 38.
- Segment 2 extends from the western city limit boundary of Hartford to the I-90 interchange. Within Hartford, this is an urban segment with many businesses adjacent to the roadway. On the west side of Hartford, traffic transitions from a rural to urban roadway section. This segment also contains the growth area of Hartford, including the key intersections with East 2nd Street and Mickelson Road/260th Street. East 2nd Street provides access to West Central Elementary School. The West Central High School parking lot is accessed directly off SD 38 to the southeast of East 2nd Street. Students living in the residential area on the north side of SD 38 cross at this location to attend the elementary or high school. Mickelson Road is a main collector road that runs east to west on the south side of Hartford. Residential areas also have direct or indirect access to SD 38 along this segment. East of Hartford, SD 38 traverses through agricultural areas, two subdivision areas, idle ground, and wetlands associated with an unnamed tributary of Skunk Creek. This segment continues to the I-90 Exit 390 interchange.
- Segment 3 is the I-90 interchange. The interchange is currently a folded diamond configuration. The new Hartford wastewater facility is being constructed within this segment, west of the interchange and south of SD 38.
- Segment 4 extends from the I-90 interchange to Marion Road. This segment is primarily rural with agricultural uses. There is a residential subdivision southeast of the intersection of 467th Avenue and SD 38. Industrial and commercial businesses exist on the east end of the segment adjacent to Marion Road. Segment 4 ends at the intersection of SD 38 and Marion Road.

SAFETY

To consider safety within the Project Study Area, SDDOT provided historical crash data for the Project Study Area that were reviewed for the eighteen study intersections to determine current crash trends and/or concerns. A crash summary was completed by HR Green in March of 2023. Crashes occurred within the intersection area of influence and outside those areas within the SD 38 corridor. Crashes were analyzed for the five-year period between 2018 to 2022 (HR Green 2023a).

A total of 171 crashes occurred within the Project Study Area. Of these incidents, there were 4 fatal

incidents (2%), 37 injury incidents (22%), and 130 property damage only incidents (76%). Refer to **Graphic 1**. A majority of the crashes were classified as non-collision incidents (57%), followed by rear-end (20%) and angle incidents (15%). Refer to **Graphic 2**. The SD 38 corridor contained 123 (72%) crash incidents and the intersection areas of influence contained 48 (28%) crash incidents (HR Green 2023a). Refer to **Graphic 3**.



SD 38 and Marion Road intersection had the highest rate of crash frequency, totaling 14 (30%) of the intersection crash instances. SD 38 east of Hartford had the highest frequency of corridor crashes with 57 (46%) of the total corridor segment crash instances. The main contributing circumstances to fatal and injury crash incidents due to a driver included drinking (20%), failure to yield vehicle (17%), disregard of traffic signs or signals (13%), or some form of roadway/lane departure (20%) (HR Green 2023a).

The crash history was reviewed, and the SD 38 corridor had a weighted crash rate of 3.45. This is higher than the statewide average crash rate of 1.73 for rural minor arterials. Many crashes were the result of vehicle-animal strikes with 63 (51%) instances reported. Most intersections had lower observed crash frequency than the predicted crash frequency (HR Green 2023a). However, the intersections of SD 38 with SD 19 and Marion Road had an average five-year crash frequency that was above the predicted crash frequency.

Predictive crash analysis was completed using the Interactive Highway Safety Design Model (IHSDM) Crash Prediction analysis tool to evaluate the safety effects and predict the expected change in crashes between design year scenarios. Future year 2050 traffic forecasts utilized traffic data supplied by the Sioux Falls Metropolitan Planning Organization (SFMPPO) and the SDDOT (HR Green 2023b). A predictive safety analysis of the SD 38 Project Study Area was completed for the design year 2050 No-Build scenario (HR Green 2023b). Along the SD 38 segments, there were a several intersections and highway segments that produced a high number of crash incidents that indicated a need for potential safety improvements (HR Green 2023b).

The traffic safety analysis indicated that the following intersections and highway segments should be investigated for future safety improvements:

- SD 38 & Western Avenue/463rd Avenue,
- SD 38 & Main Avenue,
- SD 38 & 2nd Street,
- SD 38 & Railroad Street/464th Avenue,
- SD 38 & Mickelson Road/260th Street,
- SD 38 & Marion Road,
- SD 38 segment between 459th Street and Western Avenue/463rd Avenue,
- SD 38 segment between Mickelson Road/260th Street and 466th Avenue (North), and
- SD 38 segment between 466th Avenue (South) and La Mesa Drive/470th Avenue.

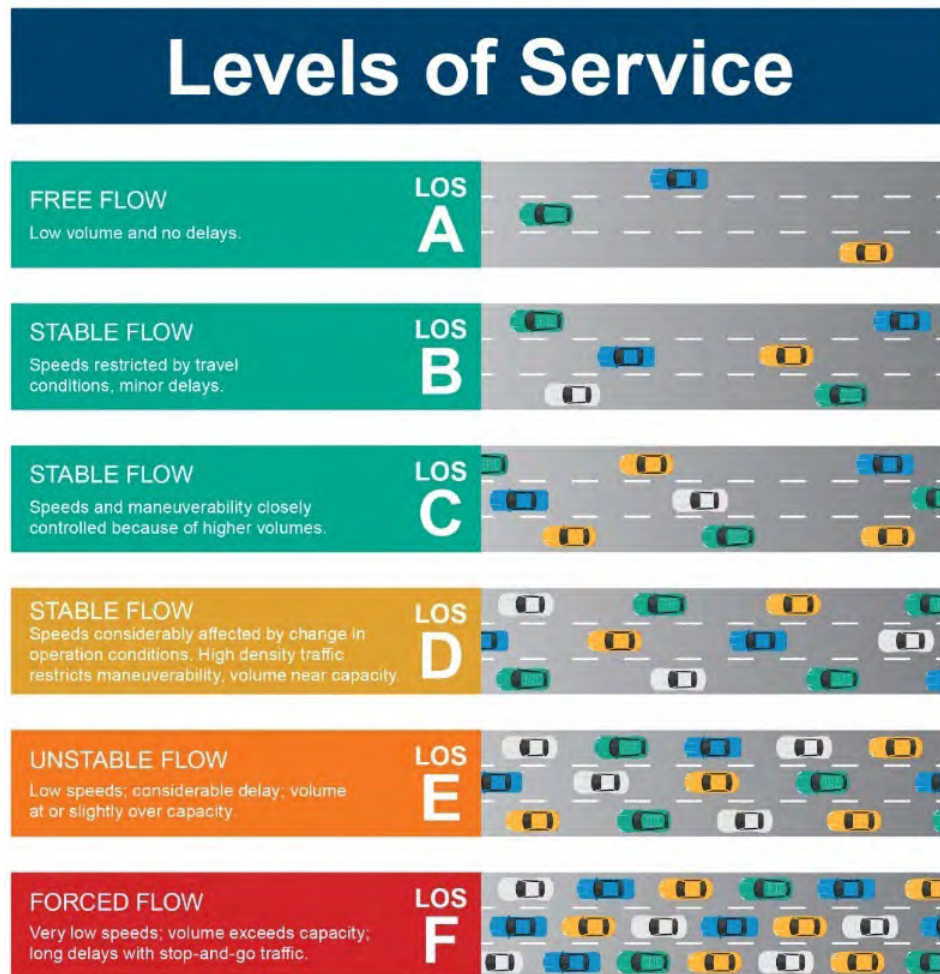
TRAFFIC CAPACITY

Existing Conditions

The SD 38 Corridor Study, Existing Traffic and Operations Analysis included an assessment of existing traffic volume data at eighteen intersections along the Project Study Area. Traffic volume data were collected on November 2, 2022, for a 12-hour period (7:00 AM to 7:00 PM) (HR Green 2023a). A review of the traffic volume data revealed distinct AM and PM peak hour periods occurring between 7:15 to 8:15 AM and 4:45 to 5:45 PM.

Intersection Level of Service (LOS) is primarily a function of peak hour turning movement volumes, intersection lane configuration, and traffic control. For intersection analysis, the Highway Capacity Manual (HCM) defines LOS in terms of the average control delay at the intersection in seconds per vehicle. Two-lane highway LOS is primarily a function of the roadway configuration, vehicle speeds, and availability of passing opportunities. For two-lane highway analysis, the HCM defines LOS in terms of the following density or the number of vehicles in a follower state per mile per lane. The results of a HCM analysis are typically presented in the form of a letter grade (A-F) that provides a qualitative estimate of the operational efficiency or effectiveness of the corridor. Much like an academic report card, LOS A represents the best range of operating conditions (i.e., motorists experiencing little delay or congestion) and LOS F represents the worst (i.e., extreme delay or severe congestion). The study utilized Level of Service (LOS) to categorize traffic flow, generally during peak (work congestion) traffic periods. Refer to **Graphic 4**.

GRAPHIC 4. Level of Service



Following SDDOT guidance, LOS C is the desired minimum traffic operational goal for intersections in rural environments while LOS D is an acceptable operational goal for intersections in dense urban environments. Under the existing conditions, the traffic operations analysis showed acceptable operations at all intersections within the Project Study Area, with intersections achieving LOS B or greater during both AM and PM peak hours. The exception was the SD 38 and La Mesa Drive/470th Avenue intersection which produced a LOS C during PM Peak Hour (HR Green 2023a).

Under the existing conditions, the traffic operations analysis showed acceptable operations along the corridors within the Project Study Area, with many segments achieving LOS B or greater during both the AM and PM peak hours. The exception was an approximately 960-foot segment of westbound SD 38 located west of Mickelson Road / 260th Street which produced a LOS C during the PM peak hour (HR Green 2023a).

In general, the existing condition traffic operations demonstrated acceptable performance measures throughout all intersections and highway segments within the Project Study Area. The desired LOS was realized for all intersections and highway segments during the AM and PM peak hours (HR Green 2023a).

Future Conditions

In order to evaluate the future traffic conditions, the 2050 ADT volumes were collected from the SFMPO

Traffic Demand Model (TDM). These forecasted volumes accounted for localized traffic growth, changes in traffic patterns, and planned roadway improvements. To determine the traffic growth within the study area and estimate 2050 peak hour volumes, the 2018 base year ADT was referenced from the TDM. Additionally, the future ADT was acquired from available SDDOT GIS data to account for portions of SD 38 that were outside of the TDM boundaries. Available development site plans were sourced and any planned development trips that have not been included in the TDM were incorporated into the future year forecasted volumes.

The initial year of 2029 was analyzed for future conditions. **Table 2** shows the results of the future traffic conditions analysis for 2029.

Table 2. Traffic Intersection Operations for Initial Year 2029

ID #	SD 38 Cross Street(s)	AM PEAK HOUR		PM PEAK HOUR	
		Delay	LOS	Delay	LOS
1	SD 19 / 457th Avenue	10.4	B	10.5	B
2	459 th Avenue	10.4	B	11.8	B
3	I-90 Speedway Entrance	0.0	A	0.0	A
4	Western Avenue / 463rd Avenue	13.5	B	16.5	C
5	Main Avenue	12.0	B	15.2	C
6	Vandemark Avenue	12.6	B	12.7	B
7	2nd Street	16.6	C	18.5	C
8	West Central High School Entrance	13.5	B	13.2	B
9	Railroad Street / 464th Avenue	18.2	C	19.8	C
10	Mickelson Road / 260th Street	24.8	C	54.5	F
11	466th Avenue (North)	19.5	C	20.3	C
12	Westbound (WB) I-90 Exit 390	11.5	B	17.7	C
13	Eastbound (EB) I-90 Exit 390	12.3	B	15.4	C
14	466th Avenue (South)	11.9	B	12.3	B
15	County 141 / 468th Avenue	13.5	B	14.5	B
16	County 139 / 469th Avenue	14.2	B	18.5	C
17	La Mesa Drive / 470th Avenue	17.0	C	21.7	C
18	Marion Road	16.2	B	20.6	C

Under the 2029 conditions, the traffic operations analysis showed acceptable operations at the majority of intersections within the Project Study Area, with intersections achieving LOS C or greater during both the AM and PM peak hours. The SD38 and Mickelson Road/260th Street intersection received a LOS F during PM peak hour which can be attributed to the additional development traffic at this intersection.

Interim year 2040 traffic operations analysis used future year traffic volumes and posted travel volumes and posted travel speeds. The SD 38 and Mickelson Road/260th Street Intersection was analyzed under traffic signal control. The results of the interim year 2040 intersection capacity analysis can be viewed in **Table 3**.

Table 3. Traffic Intersection Operations for Interim Year 2040

ID #	SD 38 Cross Street(s)	AM PEAK HOUR		PM PEAK HOUR	
		Delay	LOS	Delay	LOS
1	SD Highway 19 / 457th Avenue	11.1	B	11.2	B
2	459 th Avenue	10.9	B	12.4	B
3	I-90 Speedway Entrance	0.0	A	0.0	A
4	Western Avenue / 463rd Avenue	15.9	C	23.2	C
5	Main Avenue	13.1	B	19.0	C
6	Vandemark Avenue	13.6	B	14.6	B
7	2nd Street	21.2	C	25.6	D
8	West Central High School Entrance	13.5	B	13.2	B
9	Railroad Street / 464th Avenue	25.5	D	26.4	D
10	Mickelson Road / 260th Street	30.1	C	29.6	C
11	466th Avenue (North)	24.6	C	25.0	C
12	WB I-90 Exit 390	13.1	B	27.0	D
13	EB I-90 Exit 390	14.4	B	21.1	C
14	466th Avenue (South)	12.6	B	13.6	B
15	County Highway 141 / 468th Avenue	14.8	B	17.2	C
16	County Highway 139 / 469th Avenue	18.4	C	31.4	D
17	La Mesa Drive / 470th Avenue	23.3	C	33.0	D
18	Marion Road	17.2	B	26.5	C

Under the interim year 2040 conditions, the traffic operations analysis showed acceptable operations at the majority of the intersections within the Study Area, within the intersections achieving LOS C or greater during both the AM and PM peak hours. The five study intersections of SD 38 with 2nd Street, Railroad Street/464th Avenue, WB I-90, County 139/469th Avenue, and La Mesa Drive/470th Avenue produced an LOS D in at least one peak hour, which does not meet the LOS goal established by SDDOT.

The highway segments were also analyzed and met the LOS goals throughout the Study Area for all peak hours.

Design Year 2050 traffic operations analysis used future year traffic volumes and posted travel speeds. The SD 38 and Mickelson Road/260th Street intersection was analysed under traffic signal control. The results of the Design Year 2050 intersection capacity analysis can be viewed in **Table 4**.

Table 4. Traffic Intersection Operations for Interim Year 2050

ID #	SD 38 Cross Street(s)	AM PEAK HOUR		PM PEAK HOUR	
		Delay	LOS	Delay	LOS
1	SD Highway 19 / 457th Avenue	12.2	B	12.3	B
2	459 th Avenue	11.6	B	13.5	B
3	I-90 Speedway Entrance	0.0	A	0.0	A
4	Western Avenue / 463rd Avenue	21.5	C	46.5	E
5	Main Avenue	14.4	B	25.5	D
6	Vandemark Avenue	15.4	C	16.8	C
7	2nd Street	31.1	D	38.3	E
8	West Central High School Entrance	15.4	C	14.8	B
9	Railroad Street / 464th Avenue	41.9	E	43.8	E
10	Mickelson Road / 260th Street	19.2	B	21.3	C
11	466th Avenue (North)	31.6	D	31.4	D
12	WB I-90 Exit 390	14.9	B	66.1	F
13	EB I-90 Exit 390	18.4	C	30.0	D
14	466th Avenue (South)	13.9	B	15.7	C
15	County Highway 141 / 468th Avenue	16.7	C	21.3	C
16	County Highway 139 / 469th Avenue	30.9	D	106.2	F
17	La Mesa Drive / 470th Avenue	39.2	E	81.5	F
18	Marion Road	19.1	B	32.1	C

Under the Design Year 2050 conditions, the traffic operations analysis showed potential capacity constraints and inefficiencies at many intersections within the study area. Nine study intersections of SD 38, including Western Avenue/463rd Avenue, Main Avenue, 2nd Street, Railroad Street/464th Avenue, 466th Avenue (North), WB I-90, EB I-90, County 139/469th Avenue, and La Mesa Drive/470th Avenue, produced an LOS D or worse during at least one peak hour, which does not meet the LOS goal established by the SDDOT.

The results of the highway segment capacity analysis are shown in **Tables 5 and 6**.

Table 5. Traffic Highway Operations for Design Year 2050, Eastbound SD 38

ID #	Segment Type	AM PEAK HOUR		PM PEAK HOUR	
		Density	LOS	Density	LOS
SD 38 Eastbound					
EB 18	Passing Zone	8.1	D	3.3	B
EB 19	Passing Constrained	7.9	C	3.1	B
EB 20	Passing Constrained	8.3	D	3.4	B
EB 21	Passing Constrained	9.2	D	4.2	C
EB 33	Passing Constrained	8.2	D	2.9	B

Table 6. Traffic Highway Operations for Design Year 2050, Westbound SD 38

ID #	Segment Type	AM PEAK HOUR		PM PEAK HOUR	
		Density	LOS	Density	LOS
SD 38 Westbound					
WB 1	Passing Constrained	1.6	A	8.7	D
WB 2	Passing Zone	1.5	A	8.5	D
WB 16	Passing Constrained	3.3	B	10.9	D
WB 17	Passing Constrained	3.0	B	10.5	D
WB 18	Passing Constrained	3.2	B	10.8	D
WB 19	Passing Zone	3.1	B	10.7	D
WB 20	Passing Constrained	3.2	B	10.8	D
WB 21	Passing Constrained	3.3	B	8.7	D

Under the Design Year 2050 conditions, the traffic operations analysis showed potential capacity constraints at the segments noted in the above tables. There were four eastbound segments and eight westbound segments that resulted in LOS D during at least one of the peak hours. The segments represent areas of focus for potential capacity improvements.

Overall, the Design Year 2050 condition traffic operations demonstrated the areas within the study limits that could benefit most from potential improvements. The desired LOS was realized for the majority of intersections and highway segments during the AM and PM peak hours but there were notable exceptions that did not meet the LOS criteria goals. The recognition of issues at these locations will be used to guide future concepts.

To determine if the proposed alternatives would meet the need for traffic capacity, the following is the criterion that will be used:

- Does the alternative reduce the number of crashes in the SD 38 corridor?
- Does the alternative maintain or improve the intersections of SD 38 to an acceptable LOS level by the planning year noted?
- Does the alternative maintain or improve the eastbound and westbound traffic of SD 38 to an acceptable LOS level by the planning year noted?
- Does the alternative maintain or improve the I-90 Exit 390 Interchange to an acceptable LOS level by the planning year noted?

SUMMARY OF PURPOSE AND NEED FOR THE CORRIDOR STUDY

The Project Study Area of SD 38 is predominantly a rural two-lane highway located in a rapidly developing area that serves as a viable alternate route to I-90. Development pressure is expected to impact the SD 38 corridor with higher traffic volumes, greater demand for multi-modal (bike and pedestrian) uses, and additional access management concerns. In addition, segments of the SD 38 corridor are expected to need major rehabilitation or reconstruction within the next 10 to 15 years. The primary purpose of the corridor study is to identify existing environmental conditions and anticipated problem areas for future construction activities that will reconstruct the roadway to meet future traffic volume demands.

RANGE OF ALTERNATIVES

Five alternatives, including a no-build alternative, were identified to address the needs along the Project corridor. Three of the five alternatives include improvements to the SD 38 mainline corridor and one of the five alternatives provides multiple options that could occur at the I-90 Exit 390 Interchange over SD 38.

- **No-Build Alternative**
- **Alternative 1 – Mainline Corridor Improvements**
 - Humboldt to Hartford: 2 lanes with turn lanes as needed
 - Hartford to Railroad Street: 3 lanes
 - Railroad Street to I-90: 5 lanes
 - I-90 to Tea/Ellis Road (469th St): 2 lanes
 - Tea/Ellis Road (469th St) to Sioux Falls: 5 lanes
- **Alternative 2 – Mainline Corridor Improvements**
 - Humboldt to Hartford: 2 lanes with turn lanes as needed
 - Hartford to Railroad Street: 3 lanes
 - Railroad Street to I-90: 5 lanes
 - I-90 to Sioux Falls: 4 lanes with raised median
- **Alternative 3 – Mainline Corridor Improvements**
 - Humboldt to Hartford: 2 lanes with turn lanes as needed
 - Hartford to Railroad Street: 3 lanes
 - Railroad Street to Sioux Falls: 4 lanes with raised median
- **I-90 Exit 390 Interchange Options**
 - Option 1: Folded Diamond - match existing SD 38 Alignment
 - Option 2: Folded Diamond – 65 Degree Skew (50 mph - SD 38)
 - Option 3: Folded Diamond – 75 Degree Skew (50 mph – SD 38)
 - Option 3.2: Folded Diamond – 75 Degree Skew (50 mph – SD 38)
 - Option 4: $\frac{3}{4}$ Standard Diamond
 - Option 5: Standard Diamond Interchange
 - Option 6a: Folded Diamond Interchange with Roundabouts – 75 Degree Skew
 - Option 6b: Folded Diamond Interchange with Roundabouts – Existing Alignment
 - Option 7: Standard Diamond Interchange – Shifted East
 - Option 8: Single Point Urban Interchange (SPUI)
 - Option 9: Diverging Diamond Interchange (DDI)
 - Option 10: Tight Urban Diamond Interchange

A screening process was completed that focused on the purpose and need criterion. The purpose and need screening criterion were the following:

- Does the alternative reduce the number of crashes in the SD 38 corridor?
- Does the alternative maintain or improve the intersections of SD 38 to an acceptable LOS level by the planning year noted?
- Does the alternative maintain or improve the eastbound and westbound traffic of SD 38 to an acceptable LOS level by the planning year noted?
- Does the alternative maintain or improve the I-90 Exit 390 Interchange to an acceptable LOS level by the planning year noted?

No Build Alternative

The No Build Alternative includes only maintenance activities for the current SD 38 corridor. No improvements along the SD 38 mainline corridor or to the I-90 Exit 390 Interchange would occur. Additionally, improvements through Hartford, Humboldt, and Sioux Falls would not occur. The No Build Alternative would not meet the needs (traffic capacity and safety, and roadway condition) identified for the study.

Although the No Build Alternative does not meet the design criteria or the purpose and need, it will be carried forward as a baseline for comparing potential impacts of the build alternatives.

Alternatives that do not meet the preliminary purpose and need screening criterion have been discarded from further consideration and include Alternative 1 and Alternative 2. Alternative 1 and Alternative 2 are briefly discussed below; no figures for these alternatives have been included in this document.

Alternative 1 – Mainline Corridor Improvements

Improvements are proposed at the intersections of SD 19/457th Avenue, 258th Street, 459th Avenue, 460th Avenue, the I-90 Speedway entrance, 259th Street, 461st Avenue, 462nd Avenue, Western Avenue/463rd Avenue, Oaks Avenue, N Main Avenue, Mundt Avenue/9th Street, N Vandemark Avenue, Elm Road, East 2nd Street, West Central High School Entrance, Railroad Street/464th Avenue, 260th Street/N Maple Avenue, 456th Avenue, Kloxin Drive, Middle Drive, Boggs Circle, 466th Avenue, 467th Avenue, 261st Street, Dorothy Drive, County Highway 141/468th Avenue, Pheasant Run Avenue, County Highway 139/469th Avenue, and La Mesa Drive/ 470th Avenue. The intersection improvements include either signage for turning movements, stoplights, turn lanes, access reconfigurations that allow for more perpendicular entrances onto SD 38, or a combination thereof.

Mainline corridor improvements under Alternative 1 are divided into five separate segments along the corridor, Humboldt to Hartford, Hartford to Railroad Street, Railroad Street to I-90, I-90 to Tea/Ellis Road (469th Street), and Tea/Ellis Road (469th Street) to Sioux Falls. The Alternative 1 mainline corridor improvement from Humboldt to Hartford includes two lanes with turn lanes as needed. From Hartford to Railroad Street, improvements include a three-lane configuration with a center turn lane. East of Railroad Street, SD 38 transitions to a five-lane configuration to the I-90 intersection. Improvements from I-90 to Tea/Ellis Road (469th Street) include a two-lane configuration up to the Tea/Ellis Road (469th Street). From the Tea/Ellis Road (469th Street), SD 38 would transition to a five-lane configuration with a center turn lane.

Other improvements under Alternative 1 not associated with a roadway intersection include, but are not limited to, modification of roadway field approaches and residential approaches as needed, the addition

of lanes for through traffic, and the addition of turn lanes for entering onto and exiting from SD 38. Additionally, realignment will occur to the pedestrian path along the north side of SD 38 east of Hartford.

An additional option for Alternative 1 includes an improvement to the I-90 Speedway entrance. The entrance for the I-90 Speedway would be located approximately 500 feet east of the original entrance to allow for a more perpendicular entrance onto SD 38. The improvement would include east bound and west bound turn lanes to exit SD 38 onto the I-90 Speedway Entrance.

Due to Alternative 1 being eliminated from consideration, figures for Alternative 1 were not included in this document.

Alternative 1 has been eliminated from further consideration due to inconsistency in roadway section (5-lane to a 2-lane east of I-90, then back to a 5-lane from Tea/Ellis Road to Marion Road), driver expectancy concerns, and a reduction/lack of access control without a raised median within the rapidly growing areas of Hartford and Sioux Falls.

Alternative 2 – Mainline Corridor Improvements

Improvements are proposed at the intersections of SD 19/457th Avenue, 258th Street, 459th Avenue, 460th Avenue, the I-90 Speedway entrance, 259th Street, 461st Avenue, 462nd Avenue, Western Avenue/463rd Avenue, Oaks Avenue, N Main Avenue, Mundt Avenue/9th Street, N Vandemark Avenue, Elm Road, East 2nd Street, West Central High School Entrance, Railroad Street/464th Avenue, 260th Street/N Maple Avenue, 456th Avenue, Kloxin Drive, Middle Drive, Boggs Circle, 466th Avenue, 467th Avenue, 261st Street, Dorothy Drive, County Highway 141/468th Avenue, Pheasant Run Avenue, County Highway 139/469th Avenue, and La Mesa Drive/ 470th Avenue. The intersection improvements include either signage for turning movements, stoplights, turn lanes, reconfigurations that allow for more perpendicular entrances onto SD 38, or a combination thereof.

Mainline corridor improvements under Alternative 2 are divided into four separate segments along the corridor, Humboldt to Hartford, Hartford to Railroad Street, Railroad Street to I-90, and I-90 to Sioux Falls. The Alternative 2 mainline corridor improvement from Humboldt to Hartford includes a two-lane configuration with turn lanes as needed. From Hartford to Railroad Street, improvements include a three-lane configuration, including a center turn lane. East of Railroad Street to I-90 includes a five-lane configuration with a center turn lane. From east of I-90 to Sioux Falls, improvements include a four-lane configuration with a raised median.

Other improvements under Alternative 2 not associated with a roadway intersection include, but are not limited to, modification of roadway field approaches and residential approaches as needed, the addition of lanes for through traffic, and the addition of turn lanes for entering onto and exiting from SD 38. Additionally, realignment will occur to the pedestrian path along the north side of SD 38 east of Hartford.

An additional option for Alternative 2 includes an improvement to the I-90 Speedway entrance. The entrance for the I-90 Speedway would be located approximately 500 feet east of the original entrance to allow for a more perpendicular entrance onto SD 38. The improvement would include east bound and west bound turn lanes to exit SD 38 onto the I-90 Speedway Entrance.

Due to Alternative 2 being eliminated from consideration, figures for Alternative 2 were not included in this document.

Alternative 2 has been eliminated from further consideration due to reduced/lack of access control

without a raised median within the rapidly growing Hartford area.

Alternative 3 meets the screening criterion and is further discussed below.

Alternative 3 – Mainline Corridor Improvements

Improvements are proposed at the intersections of SD 19/457th Avenue, 258th Street, 459th Avenue, 460th Avenue, the I-90 Speedway entrance, 259th Street, 461st Avenue, 462nd Avenue, Western Avenue/463rd Avenue, Oaks Avenue, N Main Avenue, Mundt Avenue/9th Street, N Vandemark Avenue, Elm Road, East 2nd Street, West Central High School Entrance, Railroad Street/464th Avenue, 260th Street/N Maple Avenue, 456th Avenue, Kloxin Drive, Middle Drive, Boggs Circle, 466th Avenue, 467th Avenue, 261st Street, Dorothy Drive, County Highway 141/468th Avenue, Pheasant Run Avenue, County Highway 139/469th Avenue, and La Mesa Drive/ 470th Avenue. The intersection improvements include either signage for turning movements, stoplights, turn lanes, reconfigurations that allow for more perpendicular entrances onto SD 38, or a combination thereof. Refer to **Figure 3 in Appendix A** for Alternative 3 Mainline Corridor Improvements.

Mainline corridor improvements under Alternative 3 are divided into three separate segments, Humboldt to Hartford, Hartford to Railroad Street, and Railroad Street to Sioux Falls. The Alternative 3 mainline corridor improvement from Humboldt to Hartford includes a two-lane configuration with turn lanes as needed. From Hartford to Railroad Street, improvements include a three-lane configuration including a center turn lane. From east of Railroad Street to Sioux Falls, improvements include a four-lane with a raised median which is consistent with the City of Sioux Falls design standard.

Other improvements under Alternative 3 not associated with a roadway intersection include, but are not limited to, modification of roadway field approaches and residential approaches as needed, the addition of lanes for through traffic, and the addition of turn lanes for entering onto and exiting from SD 38. Additionally, realignment will occur to the pedestrian path along the north side of SD 38 east of Hartford.

An additional option for Alternative 3 includes an improvement to the I-90 Speedway entrance. The entrance for the I-90 Speedway would be located approximately 500 feet east of the original entrance to allow for a more perpendicular entrance onto SD 38. The improvement would include east bound and west bound turn lanes to exit SD 38 onto the I-90 Speedway Entrance.

Alternative 3 meets the purpose and need criterion for the corridor and is pulled forward for consideration as the preferred SD 38 mainline corridor improvement.

I-90 Exit 390 Interchange Options

The options considered for the I-90 Exit 390 Interchange will be configured to typical interchanges that allow for traffic to enter or exit the SD 38 and I-90 transportation corridors. An Interchange Modification Justification Report (IMJR) will be completed for this segment of the corridor. An IMJR is a planning document prepared to gain approval from the FHWA to modify an existing interstate interchange. Numerous configurations for the interchange were presented for evaluation, however, a preferred improvement for I-90 Exit 390 was not selected during this environmental screening. Figures for the options that have been considered up to this point are included in **Figure 4 in Appendix A**.

Options 1, 2, 3, 4, 5, and 7 for the interchange configuration were determined to not meet the purpose and need for the project and have been eliminated from consideration. Those options are discussed below.

Option 1: Folded Diamond – Match Existing SD 38 Alignment

The alignment of SD 38 would remain the same east and west of the I-90 Exit 390 interchange. The access road located on 466th Avenue off of SD 38 to a commercial business, Goos RV, would be moved west along SD 38. The new alignment would cross an unnamed tributary of Skunk Creek two times and would require the construction of a new access road to the east of the subdivision. The curves and lengths of the interchange ramps would be slightly adjusted to allow for safer entry and exit throughout the interchange. Impacts to a commercial business, Goos RV, would also occur on the southwest corner of the business where a new west-bound I-90 ramp would be constructed. South of I-90, 466th Avenue would be moved west to allow for a perpendicular intersection onto SD 38. 466th Avenue aligns with the eastbound interchange ramps to SD 38. The access along 466th Avenue to a commercial business, Cemcast Pipe and Precast, would be re-routed to the west onto private land. An access road to the Hartford Wastewater Treatment Facility would be routed to access 466th Avenue South of I-90 and SD 38. Refer to **Interchange Option 1**.

Option 2: Folded Diamond – 65 Degree Skew (50 mph – SD 38)

The alignment of SD 38 would be placed at a 65 degree skew to I-90. The access road located on 466th Avenue off SD 38 to a commercial business, Goos RV, would be moved north along the new SD 38 alignment. Curves of interchange ramps would be adjusted to allow for a safer entry and exit throughout the interchange. South of I-90, the 466th Avenue intersection with SD 38 would be moved west to allow for a perpendicular intersection onto SD 38. 466th Avenue would align with the eastbound onramp and offramp to SD 38. The access along 466th Avenue to a commercial business, Cemcast Pipe and Precast, would be re-routed to the west onto private land. An access road to the Hartford Wastewater Treatment Facility would be routed to access 466th Avenue South of I-90 and SD 38. Refer to **Interchange Option 2**.

Option 3: Folded Diamond – 75 Degree Skew (50 mph – SD 38)

The alignment of SD 38 would be placed at a 75 degree skew to I-90. The access road located on 466th Avenue off SD 38 to a commercial business, Goos RV, would be moved north and west along the skewed SD 38 alignment. The curves and lengths of interchange ramps would be adjusted to allow for a safer entry and exit throughout the interchange. South of I-90, the 466th Avenue intersection with SD 38 would be moved west to allow for a perpendicular intersection onto SD 38. 466th Avenue would align with the eastbound interchange ramps to SD 38. The access along 466th Avenue to a commercial business, Cemcast Pipe and Precast, would be re-routed to the west onto private land. An access road to the Hartford Wastewater Treatment Facility would be routed to access 466th Avenue South of I-90 and SD 38. Refer to **Interchange Option 3**.

Option 4: $\frac{3}{4}$ Standard Diamond

The alignment of SD 38 would be placed at a 75 degree skew to I-90. The access road located on 466th Avenue off SD 38 to a commercial business, Goos RV, would be moved north and west along SD 38 alignment. The westbound onramp would be moved west of SD 38 to enter I-90 and the westbound exit ramp would be moved west to align with the onramp to I-90. The I-90 eastbound interchange ramps curves and lengths would be improved to allow for a safer entry and exit throughout the interchange. South of I-90, the 466th Avenue intersection with SD 38 would be moved west to allow for a perpendicular intersection onto SD 38. 466th Avenue would be realigned to intersect with the eastbound interchange ramps. An access road to the Hartford Wastewater Treatment Facility would be routed to access 466th Avenue South of I-90 and SD 38. Refer to **Interchange Option 4**.

Option 5: Standard Diamond Interchange

The SD 38 alignment would be placed at a 75 degree skew to I-90. . The access road on 466th Avenue off SD 38 to a commercial business, Goose RV, would be moved north and west along SD 38. The westbound onramp and eastbound offramp would be moved west of SD 38 to create the standard diamond interchange configuration. The westbound offramp and eastbound onramp would be configured to the standard diamond interchange. South of I-90, 466th Avenue would intersect along its original alignment and the Hartford Wastewater Treatment Facility access road would route to south of SD 38 to intersect with 466th Avenue. Refer to **Interchange Option 5**.

Option 7: Standard Diamond Interchange Shifted East

The alignment of SD 38 would be placed at a 75 degree skew to I-90 and shifted east.. The access road on 466th Avenue off SD 38 to a commercial business, Goose RV, would be moved north and west along SD 38. The westbound onramp and eastbound offramp of I-90 would be moved west of SD 38 to create the standard diamond interchange configuration. The westbound offramp and eastbound onramp would be configured to the standard diamond interchange. South of I-90, 466th Avenue would intersect slightly east of its original alignment for a perpendicular entry and exit to SD 38. The Hartford Wastewater Treatment Facility access road would route south of SD 38 to intersect with 466th Avenue. Refer to **Interchange Option 7**.

Options 1, 2, 3, 4, 5, and 7 have significant resource impacts include impacts to businesses, residences, and the Hartford Wastewater Treatment Facility and have been further eliminated from consideration.

Interchange configuration Options 3.2, 6, 8, 9, and 10 met the screening criterion and are further discussed below.

Option 3.2: Folded Diamond – 75 Degree Skew (50 mph – SD 38)

The alignment of SD 38 would be placed at a 75 degree skew to I-90. The access road located on 466th Avenue off SD 38 to a commercial business, Goos RV, would be moved north and west along the skewed SD 38 alignment. The curves and lengths of interchange ramps would be adjusted to allow for a safer entry and exit throughout the interchange. South of I-90, the 466th Avenue intersection with SD 38 would be moved east of the current intersection onto SD 38. The new 466th Avenue intersection with SD 38 would route through a business, ANCO Underground LLC. An access road to the Hartford Wastewater Treatment Facility would be routed to access 466th Avenue South of I-90 and SD 38. Refer to **Interchange Option 3.2**.

Option 6a: Folded Diamond Interchange with Roundabouts – 75 Degree Skew

The alignment of SD 38 would be placed at a 75 degree skew to I-90. The curves and lengths of the interchange ramps would be adjusted to allow for a safer entry and exit throughout the interchange. Roundabouts would be placed in two locations where SD 38 intersects with the interchange ramps. The access road located on 466th Avenue off SD 38 to a commercial business, Goos RV, would be moved north and west along SD 38. South of I-90, 466th Avenue would intersect west of its original alignment. The Hartford Wastewater Treatment Facility access road would intersect with 466th Avenue southwest of the roundabout. Refer to **Interchange Option 6a**.

Option 6b: Folded Diamond Interchange with Roundabouts – Existing Alignment

The alignment of SD 38 would stay along the existing alignment. The curves and lengths of the

interchange ramps would be slightly adjusted to allow for a safer entry and exit throughout the interchange. Roundabouts would generally be placed in the locations where SD 38 currently intersects with the interchange ramps; the western-most roundabout would be placed slightly west of the current interchange ramp. The access road located on 466th Avenue off SD 38 to a commercial business, Goos RV, would be moved north and west along SD 38. South of I-90, 466th Avenue would intersect west of its original alignment and in-line with the roundabout. The Hartford Wastewater Treatment Facility access road would intersect with 466th Avenue southwest of the roundabout. Refer to **Interchange Option 6b**.

Option 8: Single Point Urban Interchange (SPUI)

The alignment of SD 38 would be placed at a 75 degree skew to I-90. The access road on 466th Avenue off SD 38 to a commercial business, Goose RV, would be moved north and west along SD 38. The westbound onramp and eastbound offramp of I-90 would be moved west of SD 38 to create a single point urban interchange. The westbound offramp and eastbound onramp would be configured to a single point urban interchange. South of I-90, 466th Avenue would intersect along its original alignment for a perpendicular entry and exit to SD 38. The Hartford Wastewater Treatment Facility access road would route south of SD 38 to intersect with 466th Avenue. Refer to **Interchange Option 8**.

Option 9: Diverging Diamond Interchange (DDI)

The alignment of SD 38 would be placed at a 75 degree skew to I-90. The access road on 466th Avenue off SD 38 to a commercial business, Goose RV, would be moved north and east along SD 38. The westbound onramp and eastbound offramp of I-90 would be moved west of SD 38 to create a diverging diamond interchange. The westbound offramp and eastbound onramp would be configured to a diverging diamond interchange. South of I-90, 466th Avenue would intersect just east of its alignment for a perpendicular entry and exit to SD 38. The Hartford Wastewater Treatment Facility access road would route south of SD 38 to intersect with 466th Avenue. Refer to **Interchange Option 9**.

Option 10: Tight Urban Diamond Interchange

The alignment of SD 38 would be placed at a 75 degree skew to I-90. The access road on 466th Avenue off SD 38 to a commercial business, Goos RV, would remain in approximately the same location and utilize the existing access road. The terminal intersection of the westbound on-ramp and eastbound off-ramp of I-90 would be moved east of the current SD 38 alignment to create a tight urban diamond interchange, with the ramps themselves shifting slightly north of the I-90 alignment. The terminal intersection of the westbound off-ramp and eastbound on-ramp would stay on the current SD 38 alignment and configured to a tight urban diamond interchange, with the ramps themselves shifting slightly south of the I-90 alignment. South of I-90, 466th Avenue would intersect just south of its current alignment for a perpendicular entry and exit to SD 38. The Hartford Wastewater Treatment Facility access road would route south of the new SD 38 alignment to intersect with 466th Avenue. Refer to **Interchange Option 10**.

Options 3.2, 6a, 6b, 8, 9, and 10 are alternatives coming forward from the design team and the SAT, but one preferred alternative has not been selected. Additional interchange configurations may also be presented during the IMJR process.

ENVIRONMENTAL RESOURCES AND ISSUES

This section will identify the resources or issues that will be integral for NEPA documentation with future projects. For a photo log completed during the field reconnaissance and an overview figure of the SD 38 corridor, refer to **Appendix B**.

WATER RESOURCES, INCLUDING WATERS OF THE U.S., WATERS OF THE STATE, WETLANDS, STORM WATER, AND FLOODPLAINS

All waters in South Dakota are considered Waters of the State. According to the federal Clean Water Act (CWA), Waters of the United States (U.S.) are a subset of waters of the state that are also regulated by the federal government. Waters are regulated under the CWA in one or more of the following ways:

- (1) Obtain a permit for placement of dredge or fill material in Waters of the U.S. from the United States Army Corps of Engineers (USACE) (Section 404 of the CWA),
- (2) Obtain a Surface Water Discharge permit for the discharge of pollutants from point sources into Waters of the State from the South Dakota Department of Agriculture and Natural Resources (SDANR) or a National Pollutant Discharge Elimination System (NPDES) permit for projects impacting tribal lands from the U.S. Environmental Protection Agency for discharges to Waters of the U.S. (Section 402 of the CWA), and
- (3) For federally issued permits, obtain water quality certification from the SDDANR, or for projects impacting tribal lands, from the EPA (Section 401 of the CWA).

All projects should also be developed consistent with the state nonpoint source pollution management program (Section 319).

Water resources that are considered “jurisdictional” under the CWA are subject to the multiple federal regulatory requirements set forth with Section 404 of the CWA. The CWA additionally requires that each state develop standards for their waters of the state to ensure the beneficial uses are protected. South Dakota has developed surface water quality standards for all Waters of the State. If water resources are determined to be non-jurisdictional as Waters of the U.S., the state’s regulatory requirements for Waters of the State must still be met. The environmental analysis of aquatic resources encompasses many types of resources that may be encountered in the planning, construction, and maintenance of transportation projects.

Methodology

A windshield survey identified water resources, wetlands, streams, and open water features within the Project Study Area. To provide approximate boundaries of these identified water resources, a desktop delineation was conducted. The watersheds, specifically the 8-digit Hydrologic Unit Code (HUC), were identified by the NEPA Study Area level to consider potential direct, indirect, and cumulative effects to aquatic resources.

The Federal Emergency Management Agency (FEMA) Flood Map Service Center was reviewed online for designated floodplains occurring in the Project Study Area (FEMA 2022). A Flood Insurance Rate Map (FIRM) is the insurance and floodplain map produced by FEMA that identifies, based on detailed or approximate analysis, the areas subject to flooding within an area.

Existing Conditions

Water resources, including Waters of the US, Waters of the State, wetlands, and floodplains are present within the Project Study Area.

Waters of U.S., Waters of the State, and Wetlands

The watersheds within the Project Study Area include one 8-digit HUC watershed, the Lower Big Sioux River subbasin, 10170203, and one ten-digit HUC watershed, the Skunk Creek watershed, 1017020311. Several 12-digit HUC watersheds are found within the Project Study Area, including the Beaver Lake watershed, 101702031101, Buffalo Ridge-Skunk Creek, 101702031102, Willow Creek, 101702031103, and Outlet Skunk Creek, 101702031105 (USGS 2023). Refer to **Figure 5** in **Appendix A**.

The EPA's regulations implementing Section 305(b) of the CWA require states to identify waterbody segments where the water quality does not meet the applicable water quality standards. Section 303(d) of the CWA requires states to develop Total Maximum Daily Loads (TMDLs) for those segments that do not meet the applicable water quality standards. The TMDLs identify the sources of the pollutants contributing to the impairment and allocate an allowable loading for each point source and nonpoint source of pollution.

The SDDANR monitors and assesses the water quality for watersheds across the state. Every two years, the SDDANR publishes a report integrating the requirements of Section 303(d) and 305(b) of the federal CWA. This report identifies waters of the state that are not meeting their water quality standards and prioritizes the development of the TMDLs. The 2024 Integrated Report identified the following water quality impairments in the Project Study Area:

- Skunk Creek is impaired due to *E. coli* bacteria.

These segments need to be assessed to identify the cause(s) of the impairment and identify the total maximum daily load (TMDL) for each pollutant. The EPA has approved TMDLs for for *E. coli* and total suspended solids in the Big Sioux River near the study area. A TMDL has not yet been developed for total dissolved solids in this segment of the Big Sioux River. The *E. coli* TMDL for Skunk Creek has been developed by SDDANR and is nearing completion. All projects shall be developed consistent with the approved TMDLs.

The windshield survey and desktop delineation identified approximately 5.5 acres of potential jurisdictional Waters of the U.S. within the Project Study Area, including Skunk Creek, Willow Creek, and unnamed tributaries to Skunk Creek and Willow Creek. Verification of jurisdictional status would be completed by the US Army Corps of Engineers (USACE) during the Section 404 permit application process. Skunk Creek and Willow Creek are perennial streams. Willow Creek flows south, eventually joining Skunk Creek, which continues flowing in a southeasterly direction, eventually joining the Big Sioux River east of Interstate 29 and north of Louise Avenue in Sioux Falls. The unnamed tributaries to Skunk Creek and Willow Creek were intermittent, likely having spring flows that diminish in the late summer and fall months.

SDDANR has assigned beneficial uses to Waters of the State. Skunk Creek is classified by SDDANR for the following beneficial uses:

- (6) Warmwater marginal fish life propagation waters;
- (8) Limited-contact recreation waters;
- (9) Fish and wildlife propagation, recreation, and stock watering waters; and

- (10) Irrigation waters.

Willow Creek and the unnamed tributaries are classified by SDDANR for the following beneficial uses:

- (9) Fish and wildlife propagation, recreation, and stock watering waters; and
- (10) Irrigation waters.

Based upon the desktop delineation, there are approximately 75 acres of wetlands present within the Project Study Area. Wetland basins vary in size and are primarily classified as seasonal and temporary resources, likely becoming dry in the late summer and fall months. Although not as common as basin wetlands, sloped wetlands also occur throughout the corridor. Riverine fringe wetlands were present adjacent to the stream channels. Desktop delineated wetlands and waters of the U.S. within the Project Study Area are shown on **Figures 6a to 6o** in **Appendix A**.

The wetlands are classified by SDDANR for the following beneficial use:

- (9) Fish and wildlife propagation, recreation, and stock watering waters.

Stormwater

Water quality and the intensity, timing, and velocity of runoff events are closely related to stormwater management. Surfaces with vegetation slow or capture runoff, but when these areas are replaced by impervious surfaces such as roofs, driveways, parking lots, roads, and streets, runoff is substantially increased. Stormwater management, especially on an area wide basis, has generally not been considered in the rural development review process. Minnehaha County is establishing Best Management Practices (BMP's) for a stormwater management program. BMPs would include vegetated filter strips, permeable pavement, riparian areas, and open space designs that prevent stormwater pollution from entering waterways (Minnehaha County 2015).

Existing stormwater drainage structures in the Project Study Area within the ROW of state-maintained roadways are under the jurisdiction of the SDDOT. SD 38 in the Project Study Area has multiple culvert pipe structures, two box culvert structures at the unnamed tributary crossings of Skunk Creek, one concrete slab bridge over Skunk Creek, and box culvert structures at the unnamed tributary of Willow Creek and Willow Creek crossings.

The SDDANR has issued a Municipal Separate Storm Sewer System permit to the SDDOT under the authorities of the CWA. Under this permit, the SDDOT has been required to develop and implement a stormwater management program to control stormwater runoff and control erosion associated with the South Dakota interstate road system around the city of Sioux Falls.

Floodplains

The Project Study Area crosses several designated FEMA floodplain areas (FEMA 2023a). The Flood Insurance Rate Map (FIRM) number and information regarding mapped floodplain, if present, is available in **Table 7**.

Zone A or Zone AE refers to areas with a 1% annual chance of flooding or 100-year floodplain. Zone AE refers to areas where base flood elevations have been modeled for the 100-year floodplain and a floodway has been identified. The designated floodplains are shown on **Figures 6a to 6o** in **Appendix A**.

Table 7. FEMA FIRM and Floodplain Designation

FIRM No.	Floodplain Designation	Associated Waterway
46099C0225D	Zone X	Surface Water Bodies – Voelker I WPA
46099C0240D	None	None
46099C0245D	None	None
46099C0410D	Zone A, Zone AE, LOMRs	Unnamed Tributary of Skunk Creek, Skunk Creek
46099C0426D	None	None
46099C0427D	Zone A	Unnamed Tributary of Willow Creek, Willow Creek
46099C0431D	Zone A	Unnamed Tributary of Willow Creek

A Letter of Map Revision (LOMR) is FEMA’s modification to an effective FIRM, Flood Boundary and Floodway Map, or both. LOMRs are generally based on the implementation of physical measures that affect the hydrologic or hydraulic characteristics of a flooding sources and thus result in the modification of the existing regulatory floodway, the effective Base Flow Elevations (BFEs), or the Special Flood Hazard Area (SFHA) (FEMA 2023b). Within the Project Study Area in Hartford, there are four LOMRs in effect: LOMR 10-08-0469P (effective 2/14/2011), LOMR 13-08-1106P (effective 6/16/2014), LOMR 16-08-0101P (effective 9/23/2016), and LOMR 21-08-0753P (effective 3/23/2022) (FEMA 2023a).

Groundwater

Water resources within Minnehaha County occur as surface water and groundwater. Glacial aquifers, primarily unconsolidated sand and gravel deposited as outwash by meltwater from glaciers, underlie about 240 square miles of Minnehaha County. The Project Study Area is underlain by portions of three glacial aquifers (the Big Sioux, Skunk Creek, and Wall Lake) and two bedrock aquifers (Split Rock Creek and Sioux Quartzite) (Niehus 1994). In Minnehaha County, a Water Source Protection Overlay District has been established to preserve the quality and quantity of the area’s water resources to ensure a safe and adequate supply of drinking water. The Water Source Protection Overlay District is identified within the Skunk Creek and Willow Creek drainages (Minnehaha County 2017). The Water Source Protection Overlay District is shown on **Figures 6h-6k** and **6m-6o**. Permitted, conditional, and prohibited land uses allowed within the Water Source Protection Overlay District can be found in **Table 8** (Minnehaha County 2024).

Table 8. Uses within the Water Source Protection Overlay District in Minnehaha County

Permitted Uses	Conditional Uses	Prohibited Uses
<p>1. Tanks used for the storage of regulated substances shall adhere to the regulations set forth in the zoning ordinances in Article 14A.04 of the Minnehaha County ordinances.</p> <p>2. Sewer lines must be PVC material with sealed joints.</p> <p>3. When pastured animals are confined for winter feeding and the number exceeds 200 animal units, measures shall be employed to contain all wastes on site. Winter feeding of pastured animals shall not constitute a concentrated animal feeding operation.</p>	<p>Conditional use permits are required for any use which involves the storage and/or use of a regulated substance. All available methods of preventing and controlling contamination of groundwater from waste and other contaminants shall be employed.</p>	<p>1. Sanitary landfill, solid waste transfer facility.</p> <p>2. Waste disposal except the spreading of solid and liquid animal waste.</p> <p>3. Sewage disposal pond except when in conjunction with a concentrated animal feeding operation, which is a nonconforming use. In such case, a conditional use permit shall be required for the disposal pond.</p> <p>4. Disposal of radioactive waste.</p> <p>5. Disposal of snow containing de-icing chemical.</p> <p>6. Concentrated animal feeding operation.</p> <p>7. Injection well (Class V).</p> <p>8. Petroleum products terminal.</p> <p>9. Junk or salvage yard.</p> <p>10. Manufacturing of a regulated substance.</p> <p>11. Unenclosed storage of road salt</p> <p>12. Cemetery.</p>

Next Steps

The No Build Alternative would have no effect to Waters of the U.S., Waters of the State, wetlands, stormwater, or floodplains.

All four alternatives have the potential to have permanent impacts to Waters of the U.S. As projects identified from this study progress, field delineations for each survey area would be conducted. For each project, a wetland delineation report and a request for an approved jurisdictional determination would be submitted to the USACE. Projects should be designed to minimize impacts to aquatic resources, wetlands, and streams.

Under Nationwide Permit 14 or 23, if permanent impacts are kept to less than 0.1 acre for jurisdictional, individual wetlands and 0.03 acre for Other Waters of the U.S., a pre-construction notification (PCN) to the USACE would not be needed. If permanent impacts exceed 0.1 acre to any jurisdictional wetland or 0.03 acre to any Water of the U.S., a PCN would be required. Compensatory mitigation under Section 404 would be required for all losses of stream bed that exceed 0.03 acre and permanent impacts to wetlands above 0.1 acre. For determination of permit type (nationwide or individual) for each specific improvement project, coordination with the USACE would be completed. If an individual Section 404 permit is needed, a Section 401 State Water Quality Certification would be prepared and submitted to SDDANR and the USACE. Non-jurisdictional wetlands are still waters of the state. For non-jurisdictional wetlands, Executive Order (EO) 11990 would require mitigation for any natural wetland areas.

Projects identified in this study that would disturb one or more acres will be required to obtain coverage under the SDDANR *General Permit Authorizing Stormwater Discharges Associated with Construction*

Activities under the South Dakota Surface Water Discharge System (General Permit) for discharge activities to waters of the state. The General Permit requires the development of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP would include temporary and permanent sediment and erosion control measures to minimize soil erosion and the discharge of pollutants into waters of the state. A Notice of Intent would be prepared and submitted to SDDANR for coverage under the General Permit.

Drainage and stormwater analysis would be needed as the selected alternatives move forward into specific projects. Pipe, culvert, and bridge structures may require modifications with any future roadway improvements. Modifications would be reviewed for each specific project identified in this study and would follow SDDOT design standards. Any future roadway improvements would need to be evaluated to ensure applicable water quality standards are met, with potential permitting involving state and federal agencies as applicable.

A project located within the Project Study Area would be anticipated to be designed to not affect the hydrologic or hydraulic characteristics of the area or result in modification to the existing floodways. FEMA would be contacted to review the Project to determine if the Project would have a no rise or require a Conditional Letter of Map Revision (CLOMR).

WILD AND SCENIC RIVERS

The National Wild and Scenic Rivers System was created by Congress in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Wild and Scenic River Act is notable for safeguarding the special character of these rivers, while also recognizing the potential for their appropriate use and development. South Dakota has approximately 9,513 total miles of river, of which 93 miles are designated as wild & scenic, less than 1% of the state's river miles. The Missouri River is designated as wild and scenic from Gavins Point Dam near Yankton, downstream to Ponca State Park, Nebraska, and from Fort Randall Dam to Lewis and Clark Lake.

Methodology

The National Wild and Scenic Rivers System website was reviewed for rivers designated as wild and scenic within the NEPA Study Area (NWSRS 2022).

Existing Conditions

There are no designated wild and scenic rivers in the NEPA Study Area.

Next Steps

No further steps are needed. Consideration of Wild and Scenic Rivers is not required in subsequent NEPA studies.

THREATENED AND ENDANGERED SPECIES, MIGRATORY BIRDS, EAGLES, AND UNIQUE WILDLIFE HABITAT

NEPA requires the identification and assessment of reasonable alternatives that will avoid and minimize adverse effects on the quality of the natural environment, which includes species and habitats protected under the Endangered Species Act (ESA), the Migratory Bird Treaty Act (MBTA), and the

Bald and Golden Eagle Protection Act (BGEPA). Protecting threatened and endangered species in the planning, construction, and maintenance of transportation projects is an important step in complying with the ESA.

Methodology

The United States Fish and Wildlife Service (USFWS) provides a list of threatened or endangered species by county. A list of threatened and endangered species for specific areas can also be accessed by requesting an Official Species List through the USFWS Information for Planning and Consultation (IPaC) system. An official species list of threatened and endangered species for the Project Study Area was obtained through the USFWS IPaC system (USFWS 2022a). The IPaC query and species list was updated in June 2024.

South Dakota Game Fish & Parks (SDGFP) provides a listing of documented occurrences of state listed threatened and endangered species by county. A list of documented occurrences in Minnehaha County was obtained on the SDGFP website (SDGFP 2016).

Existing Conditions

The Project Study Area lies within two ecoregions, the Prairie Coteau Region of the Northern Glaciated Plains Ecoregion and the Loess Prairies Region of the Western Corn Belt Plains Ecoregion (EPA 2022a). The Prairie Coteau Region has a characteristic tightly undulating and hummocky landscape, no distinct drainage pattern, and closely spaced semipermanent and seasonal wetlands. The Loess Prairie Region is generally rock-free with scattered wetlands on level to gently rolling plains, with most of the original tallgrass prairie vegetation having been converted to intensive row crop agriculture (EPA 2022a).

Water resources within Minnehaha County occur as surface water and groundwater. The Project Study Area is underlain by portions of three glacial aquifers (the Big Sioux, Skunk Creek, and Wall Lake) and two bedrock aquifers (Split Rock Creek and Sioux Quartzite) (Niehus 1994). The Project Study Area is in the lower Big Sioux River Basin, with drainage occurring in an easterly direction toward the Big Sioux River, which delineates the South Dakota-Iowa border (Niehus 1994). Wildlife species use aquatic ecosystems and terrestrial corridors within the Project Study Area for habitat, breeding and nesting areas, escape cover, travel corridors, and preferred food sources. Aquatic and terrestrial animals can travel parallel to the shore or creek edges to move between similar habitat patches in fragmented landscapes with otherwise sparse natural cover. Wildlife can also move perpendicular to the riparian edge, to and from aquatic and terrestrial habitats, to forage, lay eggs, or even hibernate. Although wildlife can utilize these areas, movement in either direction away from riparian areas often exposes wildlife to threats such as vehicle strike and predation, especially in maintained landscapes with minimum natural cover.

Suitable aquatic and terrestrial habitats for a variety of species are present within the Project Study Area. Vegetation, including cropland, grasses, and larger trees, is present within the Project Study Area, and is likely utilized by wildlife species, including migratory bird species.

Threatened and Endangered Species

The USFWS IPaC query (Project Code No. 2023-0028018) returned three threatened, one endangered, one proposed endangered, and one candidate species as having the potential to occur in the Project Study Area. The IPaC query was updated in October 2024 (USFWS 2024a). Refer to **Table 9**.

Table 9. Federally Listed Endangered, Threatened, or Candidate Species in the Project Study Area

Common Name	Scientific Name	Listing Status
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Endangered
Rufa Red Knot	<i>Calidris canutus rufa</i>	Threatened
Dakota Skipper	<i>Hesperia dacotae</i>	Threatened
Monarch Butterfly	<i>Danaus plexippus</i>	Candidate
Western Regal Fritillary	<i>Argynnis idalia occidentalis</i>	Proposed Threatened
Western Prairie Fringed Orchid	<i>Platanthera praeclara</i>	Threatened

The SDGFP Environmental Review Tool was used to identify state and federally listed threatened, endangered, and candidate species that have a range distribution within the Project Area (SDGFP 2022b). Within the project area, one additional species has been documented, the Lined Snake. Refer to **Table 10**. The northern river otter (*Lontra canadensis*) is also listed on the SDGFP list as a documented state-threatened species found in Minnehaha County (SDGFP 2016); however, the otter was removed from the state list in May 2020.

Table 10. State Listed Endangered or Threatened Species Documented in Minnehaha County

Common Name	Scientific Name	Listing Status
Lined Snake	<i>Tropidoclonion lineatum</i>	State Endangered

The following species narratives provide summarized habitat descriptions for the federal and state listed species above.

Northern Long-eared Bat

The northern long-eared bat (NLEB) is a wide-ranging bat species that typically overwinters in caves or mines, called hibernacula, and spends the remainder of the year in forested habitats. The winter hibernacula for the NLEB generally have constant air temperatures, high humidity, and no air currents. Bats tend to hibernate most often in small crevices or cracks. During the summer and portions of the fall and spring, NLEBs may be found roosting singly or in colonies underneath bark, in cavities or crevices of both live trees and snag (dead) trees. The species has also been found roosting in structures, such as barns and sheds (USFWS 2024b).

Riparian wooded areas, rural residential shelterbelts, and man-made structures are present within the Project Study Area and could provide suitable habitat for the NLEB.

Rufa Red Knot

The rufa red knot is a medium-sized shorebird, easily recognized during the breeding season by its distinctive rufous (red) plumage. The breeding range of the species is in the central Canadian Arctic, with nesting occurring in dry, slightly elevated tundra locations, often on windswept slopes with little vegetation. Nest sites are generally within 600 feet of a freshwater wetland. Each year, some individuals make one of the longest distance migrations, traveling up to 19,000 miles annually from the Canadian Arctic to the wintering grounds in South America, or vice versa (USFWS 2020). Although not a common occurrence, rufa red knots have been observed within South Dakota, which can provide stop-over habitat and staging areas along river corridors.

Suitable habitat for the rufa red knot does not exist within the Project Study Area.

Dakota Skipper

The Dakota skipper is a small butterfly that lives in high-quality mixed and tallgrass prairie. The species

experienced a decline coinciding with the conversion and degradation of its prairie habitat, losing 85-99% of its original tallgrass prairie in its historical range. The Dakota skipper lives in two types of prairie habitats: moist bluestem prairie with three wildflower species (wood lilies, harebells, and smooth camas) or upland prairie that is relatively dry and dominated by bluestem grasses, needlegrasses, and coneflowers (USFWS 2024c).

Vegetation within the Project Study Area primarily includes roadside ditches consisting of smooth brome grass that is mowed annually. Moist bluestem prairie and upland prairie grasses are unlikely to occur within the Project Study Area due to repetitive mowing and haying during the growing seasons. Therefore, suitable habitat for the Dakota skipper does not exist within the Project Study Area.

Monarch Butterfly

The monarch butterfly is large and conspicuous, with bright orange wings covered with black veins and surrounded by a black border with white spots. During the breeding season, monarchs lay their eggs on their obligate milkweed host plant (*Asclepias* spp.), and larvae emerge after two to five days. The larvae feed on milkweed, pupate into a chrysalis, and emerge as an adult butterfly 15 to 32 days after initially hatching. Milkweed and flowering plants are required for monarch habitat; adult monarch butterflies will feed on the nectar of many species of flowers during migration and breeding but will only lay eggs on the milkweed plant (USFWS 2024d).

Given the likely presence of milkweed in roadside ditches, the monarch butterfly is likely present within the Project Study Area. As a candidate species, monarchs have no legal status under the ESA (50 CFR part 402) on non-federal lands and will be reevaluated in 2024 for listing. However, on federally owned lands, a more pro-active approach to avoidance of activities that may lead to take of the species may be implemented during the May 1 to August 31 timeframe, the larval growth season of the monarch butterfly.

Western Regal Fritillary

The western regal fritillary is similar to the monarch butterfly in appearance; however, it is smaller in size. The western regal fritillary has six legs and vibrant orange wings with black marks that fade into a cobalt blue on the outer part of the wings with white spots along the border. Regal fritillary butterflies live in tall-grass prairie and other open and sunny locations such as damp meadows, marshes, wet fields, and mountain pastures. Regal fritillary habitat has been identified as large grassland areas with prairie remnants or lightly grazed pasture lands containing prairie vegetation where topography often includes hills and valleys. Regal fritillary butterflies depend on three main habitat components: violet hostplants for larvae, nectar plants for adults, and native warm-season bunch grasses that provide protective sites for all life stages (USDA 2024).

Western Prairie Fringed Orchid

The western prairie fringed orchid is a terrestrial member of the orchid family, growing up to 4 feet tall, and historically occurring in the tallgrass prairie region of the United States in areas of high soil moisture. Main threats to the orchid include the conversion of remnant prairie to cropland, spread of non-native invasive plant species, encroaching woody vegetation, and changes in hydrology. No populations are known to exist within South Dakota (USFWS 2021).

Vegetation within the Project Study Area primarily includes roadside ditches consisting of smooth brome grass that is mowed annually. Since there are no known populations of western prairie fringed orchid in South Dakota and tallgrass prairie does not exist in the Project Study Area, the western prairie fringed orchid is not expected to occur in the Project Study Area.

Topeka Shiner

The Topeka shiner is a small minnow that lives and breeds in graveled pools of low-order prairie streams with low flows and floodplain connectivity. After being federally listed in 1999 as an endangered species, survey efforts revealed additional extant populations in South Dakota and Minnesota, while population reductions continue in other states. South Dakota's Topeka shiner extant streams include 27 streams within the James River watershed, not including the James River main stem, 15 streams within the Vermillion River watershed, including the Vermillion River main stem, and 30 streams within the Big Sioux River watershed (10 shared with Minnesota), including the Big Sioux River main stem (USFWS 2018).

Topeka shiners have been documented within Minnehaha County. The Skunk Creek drainage is listed as "potentially occupied", and the Willow Creek drainage has documented occurrences prior to 1999 (SDGFP 2022a).

Lined Snake

The lined snake is a small snake (9-15 inches) with three light-colored stripes running the length of its body. The lined snake is found in open grasslands and sparsely wooded areas, preferring moist habitat near springs, ponds, marshes, streams, and rivers. The snake can also be found in urban areas such as city lots, parks, cemeteries, and gardens. Within South Dakota, individuals have been documented in Hutchinson, Minnehaha, Lincoln, and Union Counties (SDGFP 2020).

Minnehaha County has documented occurrences of the lined snake and, due to its occupancy of a variety of habitats, suitable habitat for the lined snake may exist in the Project Study Area.

Special Status Species

The birds listed below in **Table 11** are birds of particular concern either for occurring on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in the Project Study Area (USFWS 2024a).

Table 11. Special Status Species

Common Name	Scientific Name	Listing	Probability of Presence
American Golden-plover	<i>Pluvialis dominica</i>	BCC	September
Bald Eagle	<i>Haliaeetus leucocephalus</i>	BGEPA*	Year Round
Black Tern	<i>Chlidonias niger</i>	BCC	May
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	BCC	May
Bobolink	<i>Dolichonyx oryzivorus</i>	BCC	May – August
Chimney Swift	<i>Chaetura pelagica</i>	BCC	April – September
Eastern Whip-poor-will	<i>Antrostomus vociferus</i>	BCC	August
Franklin's Gull	<i>Leucophaeus pipixcan</i>	BCC	April – November
Grasshopper Sparrow	<i>Ammodramus savannarum perpallidus</i>	BCC	May-August
Hudsonian Godwit	<i>Limosa haemastica</i>	BCC	April
Lesser Yellowlegs	<i>Tringa flavipes</i>	BCC	April – May, August-Sept
Marbled Godwit	<i>Limosa fedoa</i>	BCC	April – May
Northern Harrier	<i>Circus hudsonius</i>	BCC	April – September
Pectoral Sandpiper	<i>Calidris melanotos</i>	BCC	April, May, July – October
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	BCC	May – June, August – Sept
Rusty Blackbird	<i>Euphagus carolinus</i>	BCC	March, April, October
Semipalmated Sandpiper	<i>Calidris pusilla</i>	BCC	April, May, August
Upland Sandpiper	<i>Bartramia longicauda</i>	BCC	April, June – July
Western Grebe	<i>Aechmophorus occidentalis</i>	BCC	April – May
Wood Thrush	<i>Hylocichla mustelina</i>	BCC	May

*Bald and Golden Eagle Protection Act

Migratory Birds and Eagles

The Migratory Bird Treaty Act (MBTA) of 1918 provides a program for the conservation of migratory birds that fly through the United States. The lead federal agency for implementing the MBTA is USFWS. The law requires federal agencies to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any migratory birds or result in the destruction or adverse modification of designated critical habitat of such species. The law makes it illegal for anyone to “take,” possess, import, export, transport, sell, purchase, barter or offer for sale, purchase, or barter, any migratory bird, or their parts, feathers, nests, or eggs. “Take” is defined as “to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or any attempt to carry out these activities.”

In South Dakota, there are several bird species that traverse the state, rear young, or use stop-over habitat. Migratory birds, in addition to those mentioned in **Table 11** above, are likely present within the Project Study Area, and include, but not limited to duck and goose species, mourning doves, American robins, red-tailed hawks, sandhill and whooping cranes, warblers spp., swallows spp., curlews spp., and American white pelicans.

Bald eagles are listed by USFWS as species of concern in the Project Study Area. The bald eagle is not listed on the BCC list but instead warrants attention because of the Bald and Golden Eagle Protection Act (BGEPA) or for potential susceptibilities in offshore areas from certain types of development or activities. The BGEPA prohibits anyone, without a permit issued by the Secretary of the Interior, from “taking” bald or golden eagles, including their parts (including feathers), nests, or eggs.

In South Dakota, bald eagles can be a year-round resident or a migratory species. Generally, eagles are observed near larger rivers, such as the Missouri River, and open-water reservoirs where there is an abundant food supply and limited human activity. During a field reconnaissance in March 2024, a biologist from Banner Associates confirmed an active bald eagle nest and two bald eagle adults within the Project Study Area. The nest is located on the north side of SD 38 approximately 0.5 miles east of Humboldt, near Beaver Lake. Foraging and roosting habitat for bald eagles exists along the Project Study Area and within wooded reaches of Skunk Creek and Willow Creek outside of the Project Study Area. Several observations of bald eagles have been recorded near the Project Study Area (eBird 2022).

Next Steps

The No Build Alternative would have no effect on threatened or endangered species, migratory birds, eagles, or unique wildlife habitats.

As projects are identified from the study, coordination with the USFWS and SDGFP should occur, focusing on impacts to threatened or endangered species, migratory birds, eagles, and unique wildlife habitats. USFWS lists are valid for 90 days; an updated species list would be needed prior to coordination with the USFWS. For the species that are likely present in the Project Study Area, project commitments would be identified for each project during agency coordination.

CULTURAL RESOURCES

Section 106 of the National Historical Preservation Act (NHPA), as amended, guides the process of considering the effects of federal undertakings on historic properties. As such, Section 106 applies to federal agencies and to projects that are carried out with federal financial assistance; or those requiring a federal permit, license, or approval. Section 106 seeks to accommodate historic preservation concerns with the needs of federal undertakings through consultation among the agency officials and

other parties with an interest in the effects of the undertaking on historic properties. This section defines key terms used in the protection of historic properties, introduces the applicable authorities, and describes the environmental commitments established for compliance with Section 106.

Section 4(f) of the USDOT Act of 1966 provides protection to publicly owned parks, recreation areas (including recreational trails), wildlife or wildfowl refuges, or any publicly or privately-owned historic site listed or eligible for listing on the NRHP. Additional information on the correlation between Section 106 and Section 4(f) will be provided in Section 4(f) and Section 6(f) Resources section below.

Methodology

A Level I cultural record search typically consists of initial records, maps, and literature searches, and will identify known cultural resources from previous investigations conducted within the Area of Potential Effect (APE). Literature searches may include sources from a state's State Historic Preservation Office, universities, libraries, museums, and historical societies. The Level I record search provides a cultural history of a project area and evaluates the area's known and potential sensitivity for cultural resources which may be affected by construction impacts. A Level I cultural records search to identify historic properties within the Project Study Area was requested through the State Archaeological Research Center (SARC).

Existing Conditions

A Level I record search, *Class I Record Search for the South Dakota Department of Transportation (SDDOT) SD38 Corridor Planning Study, associated with SDDOT Project HP 5596(24)P, PCN 08LK, Minnehaha County, South Dakota*, was conducted. The record search returned two archaeological sites, 25 previous cultural resource surveys, one bridge, and two structures that have been previously documented within the Project Study Area. One of the two archaeological sites within the Project Study Area corridor have been determined eligible for the National Register of Historic Places (NRHP). Additionally, one of the two previously documented structures is a building that is unevaluated for the NRHP. Within a one-mile radius of the Project Study Area, eight archaeological sites, 52 previous surveys, 12 bridges, two cemeteries, and 35 structures have been recorded (SARC 2023).

An inactive railroad grade is located within the Project Study Area; the rails have been removed from the grade. The Level I record search determined portions of the railroad grade, once part of the Chicago & Northwestern Railroad, are eligible under the NRHP within the Project Study Area (SARC 2023). Additional unrecorded segments of the railroad grade are visible on aerial imagery within the Project Study Area and would also likely be eligible for listing under the NRHP.

Next Steps

The No Build Alternative would have no effect on cultural resources.

As alternatives for the Project are defined, impacts on historical resources will be assessed. The APE for each project would be created and evaluated for the presence of cultural or historical resources. A Level III Cultural Resources Survey and Report would be completed for areas within the APE that have not been previously surveyed.

To the extent possible and practical, identified cultural resource site boundaries and historic structures that are eligible to the National Register of Historic Places (NRHP) should be avoided. If these sites and structures cannot be avoided, efforts to minimize effects should be implemented. One unevaluated structure within the Project Study Area will require evaluation under the NRHP. A Class III intensive

cultural resource survey is recommended by the South Dakota State Historic Preservation Office (SHPO) (SARC 2023) and would be conducted for projects having the potential to impact areas not previously disturbed. Minimization methodologies, if needed, would be determined as the Project progresses. Consultation with SHPO would occur during the NEPA process to determine the effect to historical or cultural resources.

SECTION 4(F) AND SECTION 6(F) RESOURCES

Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966 provides protection to publicly owned parks, recreation areas (including recreational trails), wildlife or wildfowl refuges, or any publicly or privately-owned historic site listed or eligible for listing on the NRHP. Section 4(f) only applies to USDOT agencies. Compared to the many procedural environmental laws that apply to federal highway actions, Section 4(f) is a substantive law that precludes project approval if there is a use of a Section 4(f) property when a prudent and feasible avoidance alternative is available.

Some park and recreational resources are also regulated under the Land and Water Conservation Fund (LWCF) Act of 1965, which established a federal funding program to assist states in developing outdoor recreation sites. Section 6(f) of the LWCF ensures that a recreational area funded with LWCF assistance is continually maintained in public outdoor recreation use unless the National Park Service (NPS) approves the conversion in accordance with the Statewide Comprehensive Outdoor Recreation Plan (SCORP) (36 CFR 59.3). When a Section 6(f) land conversion is proposed for a highway project, replacement land will be necessary. Coordination for Section 6(f) projects is completed with the SDGFP Grants Coordinator. SDGFP will consult with the NPS Midwest Regional Director or designee for a determination on the potential impacts on Section 6(f) properties and replacement properties.

Methodology

The SDGFP Environmental Review Tool was utilized to determine the presence of publicly owned parks, recreation areas or trail systems, wildlife or waterfowl refuges, game production areas, and easements managed by the Natural Resources Conservation Service or USFWS (SDGFP 2022b). The results of the SARC Level I record search were utilized to determine the presence of any known publicly or privately owned historic sites (SARC 2023). Coordination with the SDGFP Section 6(f) coordinator was conducted to determine if any Section 6(f) properties are within the Project Study Area.

Existing Conditions

Section 4(f)

The Voelker 1 Waterfowl Production Area (WPA) is located south of SD 38, east of Humboldt. Refer to **Figure 5b**. The WPA is federal property managed by the USFWS Madison Wetland Management District. The WPA is located in Section 14, Township 102 North, Range 52 West, south of SD 38. Signs designating the boundary of the WPA are located along the property boundary, and the property includes the inactive railroad grade of the Chicago & Northwestern Railroad from the 258th Street intersection of SD 38, west to 459th Avenue. The WPA boundary on the south side of SD 38 has a barbed wire fence present. There are no USFWS or Natural Resource Conservation Service (NRCS) easement areas present within the Project Study Area (SDGFP 2022b).

The Hartford City Park is on the southwest side of SD 38 across from the Central Valley Golf Course. The recreational opportunities within Hartford include the City Park, a swimming pool, baseball diamonds, softball diamonds, tennis courts, swings, slides, picnic shelters, basketball court, restrooms, and changing rooms. Refer to **Figure 5g** and **5h**.

The Central Valley Golf Course is present within Section 22, Township 102 North, Range 51 West in the Project Study Area (County Office 2023). The golf course is owned and operated by All In Golf, LLC and is open to the public. Refer to **Figure 5g** and **5h**.

One recreational facility, the Michael J. Fitzmaurice Trail, parallels the north side of SD 38 from the intersection of SD 38 and E. 2nd Street in Hartford, extending 1.5 miles east to the intersection with Crestview Drive in the Hartford Hights Addition residential development east of Hartford.

The Sioux Falls MPO Bicycle Plan identified SD 38 as a roadway that provides connectivity and identified key intersections along SD 38 such as Colton Road, Mickelson Road, and I-90 to 463rd Avenue (Western Avenue, Hartford) that need capacity improvements (MPO 2020) for recreation. Section 4(f) applies only when the land is publicly owned land and the public agency that owns the property has formally designated and determined it to be significant for a park, recreation area, or wildlife and waterfowl refuge. The future planned bike route is not currently considered a Section 4(f) property as it is not presently publicly owned or formally designated.

The state of South Dakota owns a 54.39-acre parcel of land at the far eastern end of the Project Study Area, northwest of the intersection of SD 38 and Marion Road. Regional offices for the SDDOT and the SDGFP are located on this parcel; this land is not being used for a park or other recreational activity.

Several listed, eligible, and unevaluated historical resources are present within the Project Study Area. These resources have been previously addressed in the *Cultural Resources Existing Conditions* section above.

Section 6(f)

There are currently no Section 6(f) properties within or adjacent to the Project Study Area. Coordination with SDGFP noted that the Hartford City Park is encumbered with Section 6(f) funds, but a buffer exists between the park and the highway (SDGFP 2023).

Next Steps

The No Build Alternative would have no effect on Section 4(f) or Section 6(f) resources.

As projects identified during this study progress, coordination will occur to confirm the 4(f) or 6(f) resources noted above and check for any additional resources that may have been developed or added since the writing of this document. During preliminary and final design of each project, avoidance or impacts of the resources will be considered. The current Section 4(f) resources present in the Project Study Area include the pedestrian trail, the WPA, and the previously evaluated eligible sites and historical structures.

At the implementation of any upcoming projects in the corridor, the future bike trails would need to be reviewed to determine their status as 4(f) resources. Currently, future trails do not qualify as Section 4(f) resources. If the 4(f) resources cannot be avoided, coordination would occur to determine the use of the resource between the agency of jurisdiction, SDDOT, and FHWA.

PALEONTOLOGICAL RESOURCES

Paleontological resources are the fossilized remains of prehistoric plant and animal organisms, as well as the mineralized impressions (trace fossils) left as indirect evidence of the form and activity of such organisms. These non-renewable resources may be scientifically significant.

Methodology

A paleontological survey is not necessary as part of this study. There are no laws within South Dakota requiring the review of paleontological resources as a part of the NEPA process. During the coordination process, if a comment from a federal land managing agency is received, paleontological resources should be considered. Additionally, paleontological resources must be considered if they are identified as components of cultural resources or Traditional Cultural Properties (TCPs).

Existing Conditions

The NEPA Study Area lies in an area formed by the Precambrian period, the earliest part of Earth's history, spanning 4,000 to 543 million years ago. Two exposures of Precambrian rocks exist within South Dakota, one found in the Black Hills, and one found in the eastern part of the state, comprising the Sioux Arch. The Sioux Arch consists of metamorphosed sandstone and claystone deposited in a shallow sea. Catlinite, a type of claystone, was mined by Native Americans and used to make ceremonial pipes and figurines. Due to the metamorphic nature of these rocks, no fossils have been found within them (Paleontological Portal 2023).

The Project Study Area does contain federal land, the Voelker I WPA, managed by the USFWS Madison Wetland Management District.

Next Steps

The No Build Alternative would have no effect on paleontological resources.

As projects identified during this study progress, additional paleontological resource coordination may be needed due to a federal land managing agency owning property within the Project Study Area.

LAND USE AND ECONOMIC RESOURCES

Land use affects the quality of life and environment of the community. Land use designations often include zoning, future land use and growth management areas, conservation easements, urban infrastructure service boundaries, and annexation plans, as well as past, existing, and future development trends. Incorporating current and future land use and forecasting land use and trends are a key consideration in transportation planning, design, and construction.

Economic resources consider the business trends within an area. These resources are complemented by depictions and descriptions of current and future land uses that provide an understanding of areas of economic growth.

Methodology

A review was conducted of existing and proposed land use in the NEPA Study Area and any anticipated changes in land use utilizing available information including planning documents, zoning maps, master plans, US Geological Survey (USGS) topographical maps, and GIS data, for Hartford, Humboldt, Sioux Falls, and Minnehaha County. The specific planning documents utilized included:

- **Humboldt Comprehensive Plan 2003 – 2025.** In 2003, the plan was completed to accomplish three main goals: to ensure the health and safety of citizens, protect natural resources, and enhance the visual quality of the community.
- **Minnehaha County Zoning Map (2012).** This zoning map was configured in 2012 to designate land use zones for Minnehaha County. The map was included in the Envision 2035

Comprehensive Plan. Land use zoning categories shown on the map are accurate as of the date of this report. Updated information can be attained by contacting the Minnehaha County Planning and Zoning, GIS Department.

- **Envision 2035 Comprehensive Plan (2015).** Minnehaha County adopted this plan for the purpose of protecting and guiding the physical, social, economic, and environmental development of the county; to protect the tax base; to encourage a distribution of population or mode of land utilization that will facilitate the economical and adequate provisions of transportation, roads, water supply, drainage, sanitation, education, recreation, or other public requirements to lessen governmental expenditure; and to conserve and develop natural resources.
- **Shape Sioux Falls 2040 Comprehensive Plan (2016).** Updates to the plan were completed in 2019 and 2022 to accommodate maps for development areas, sanitary availability, water and roads, drainage, and future land uses.
- **Hartford Comprehensive Plan 2017-2037.** In 2017, the plan was completed to accomplish two primary purposes: One, to address the planning requirements of state law while also providing a sound and logical basis for city growth and management strategies, and two, to provide predictability about the potential land uses and timing of development. This strategy would allow both public and private sectors to make informed decisions in real estate and capital investments.
- **Go Sioux Falls Long Range Transportation Plan (2020).** The plan would guide transportation planning activities and strategies to shape the greater Sioux Falls region's transportation network.

Existing Conditions

Land uses zoned within Minnehaha County have been grouped into five broad categories: farm/agricultural, commercial/industrial, rural residential, developed, and recreation/conservation (Minnehaha County 2012). The Humboldt, Hartford, and Sioux Falls comprehensive plans have designated zoning and land use information, described more in detail below.

- Farm/agricultural land use areas were mentioned in all the comprehensive plans and are located outside of the city limits of Humboldt, Hartford, and Sioux Falls. Primary uses in these designated areas are mainly cultivated crops, pasture, or hay land.
- Residential areas were discussed in the Humboldt, Hartford, and Sioux Falls comprehensive plans and are found within the cities themselves and scattered throughout the SD 38 corridor.
- Humboldt's Comprehensive Plan evaluated urban land use, including industrial, commercial, single-family residential, multi-family residential, institutional and governmental, transportation and utility, conservation and recreation, and agricultural.
- Hartford's Comprehensive Plan evaluated land uses, including industrial, commercial, mixed-use, residential, multi-family residential, manufactured housing, institutional, parks, recreation and open space, and vacant.
- Hartford was planning a future Wastewater Treatment Facility (WWTF) along SD 38 east of Hartford; this facility is currently under construction and is anticipated to be operational by July 2025.
- Sioux Falls Comprehensive Plan evaluated land uses including single-family, multi-family, office/institutional, commercial, industrial, mining/airport, open space, agriculture, serviceable lots, and other uses.

Industrial use zoning is present near Hartford and Sioux Falls, including:

- Buffalo Ridge Ghost Town and Country Store, ANCO Underground, Cemcast pipe and Precast, and Meyer Truck and Trailer located south of Exit 390 on SD 38.

Commercial areas and businesses present along the Project Study Area corridor are identified in **Table 12**. These businesses utilize SD 38 as a critical east/west route for transport of goods and access for customers.

Table 12. List of Businesses within the NEPA Study Area

Name	Business Type	Name	Business Type
Siemonsma Electric LLC	Construction Company	Grocott Ink and Thread	Custom Clothing
Humboldt Fire Hall	Emergency Services	Coffee Cup Fuel Stop	Gas Station
Big J's Roadhouse	Restaurant	Pinecrest Estates	Apartments
Sinclair Station	Gas Station	Deer Hallow Apartments	Apartments
Ludens Inc.	Manufacturing	Daisy Storage	Storage
Reliabank (Humboldt)	Bank	The C3 Enterprise	Automotive Rental
Triple J Lumber	Lumber Provider	Central Valley Community Church	Church
St Ann Parish of Minnehaha County	Church	Caribou Coffee	Coffee Shop
Travis Taxidermy	Taxidermy	Light to the World Church	Church
Farmers Elevator	Elevator	American Inn by Wyndham Hartford	Hotel
N-Rich Plant Food	Grocery Store	Vanilla Bean Kings	Grocery Store
Main Street Humboldt Bar	Restaurant	Hofer Roofing	Contractor
The Deku Tree	Greenhouse	Elite Self Storage	Storage
Beckers Bright Beginnings	Daycare	Glanzer Performance	Automotive
Faith Lutheran Church	Church	Gillespie Outdoor Power Equipment	Hardware & Equipment
West Central Elementary School	School	Wrap Ability	Automotive
Needles Field West Central Baseball	Recreation	SD Lining Solutions	Contractor
West Central Baseball Association	Recreation	ABR Antique Mall	Shopping
Nortec Seeds	Seed Provider	Ideal Weight Solutions	Weight Loss Service
Roundhouse Trackless Trains	Manufacturing	Aunt-T'S-Ques Wayside Shoppe	Shopping
Hunters Pointe Shooting Complex	Recreation	Maras Incorporated	Farm Equipment
I-90 Speedway	Racetrack	HDC Storage	Storage
R Place Kennel	Pet Services	Blackburn Basement Systems	Construction Contractor
Haensel Distributing Company	Distributor	Impact Auto Works	Automotive
Central States Manufacturing Inc.	Manufacturing	The American Truck Store	Automotive
Giant Leap Design	Designer	Pro Framing Inc.	Framing Contractor
Swensen Park	Recreation	Jeff Murphy Auto Sales	Automotive Dealer
Pizza Ranch	Restaurant	Kieen Solution	Restaurant Supply Store
Aerial Ingenuity	Photographer	Ideker Construction	Construction Contractor
Hartford Building Center	Construction/ Lumber	Dakota Thrill Rides	Automotive
ATS Complete Diesel & Automotive	Automotive	RV & Boat Storage	Automotive
Reliabank (Hartford)	Bank	Block Works	Automotive
The Goat Bar and Grill	Restaurant	Dakota Classic Mustangs	Automotive
West Oaks Estates	Apartments	A & B Mobile RV Repair LLC.	Automotive/Recreation
Edward Jones Financial Advisor	Financial	R & R Self Storage	Storage
First Interstate Bank (Hartford)	Bank	Guardrail Enterprises Inc.	Guardrail Supplier
United States Postal Service	Package/Shipping	West Central High School	School

Name	Business Type	Name	Business Type
Hartford Veterinary Clinic	Pet Services	West Central Special Education	School
Sherri Bostwick	Physician	Hartford Cemetery	Cemetery
Sunshine Foods	Grocery Store	Ignite Your Brand	Branding Agency
NAPA Auto Parts	Automotive	Maple Pass Apartment/Town Homes	Apartments
Barney & Coco's Pet Salon	Pet Services	Meter Fishing Tackle	Recreation
R & B Auto Sales and Services	Automotive	Carl V Carlson Company	Concrete Contractor
Get-n-Go Station (Hartford)	Gas Station	Goos RV	Automotive
Hartford Steak Co. Tavern	Restaurant	Buffalo Ridge Ghost Town	Shopping
Beaver Build Inc	Manufacturing	Buffalo Ridge Country Store	Gas Station
Knotty Gnome Variety and Salvage	Shopping	ANCO Underground	Contractor
Dollar General	Shopping/Grocery Store	Cemcast Pipe and Precast	Manufacturing
Subway	Restaurant	Meyer Truck and Trailer	Automotive
Great Life Fitness	Gym	Tuschen's Taxidermy	Taxidermy
Eich Law Offices	Law Services	McCrossan Boys Ranch	Social Services
Lemke's Fitness & Training Co	Gym	Diamond In the Ruff Grooming	Pet Services
Prairie Boutique	Shopping	38 Roadhouse	Bar/Restaurant
Stomping Grounds	Coffee Shop	TierPoint West Data Center	Utility Provider
Stepping Stones Preschool	School	South Dakota DOT	Public Service
Vista Crossing	Apartments	South Dakota Game, Fish and Parks	Public Services
Central Valley Golf Course	Recreation	South Dakota Highway Patrol	Emergency Services
Hartford Pool and Softball Fields	Recreation	ADP South Dakota	Payroll Service
COZY Home and Lighting	Shopping/Design	Kinder Academy	Child Care
A1 Plumbing Heat and Air	Construction	University Hills Village	Apartments
Century Square Park	Recreation	Credo's Pub	Restaurant
Hartford United Methodist Church	Church	The Brixx	Apartments
Salon Capella	Salon	Hazeltine Residential Development	Development Agency
Modish Designs and Boutique	Shopping/Design	2b Fiber Optic	Utility Provider
Buffalo Ridge Brewing	Brewery	Falls Beauty Wigs	Beauty Provider
Kinzley Funeral Chapel	Funeral Home	West Pointe Townhomes (Sioux Falls)	Residential Provider
Sideline Diesel	Automotive	Westside Lutheran Church	Church
South Bar	Bar/Restaurant	Robinson Construction Group	Contractor
Toy Storage Etc.	Storage	360 Builders	Building Contractor
Hartford Mini Storage	Storage	Landa Plastering and Stone	Contractor
A & C Child Care, LLC	Daycare	Paraclete Solutions	Electrician Contractor
Hartford's Best Paint and Body	Automotive	Sioux Commercial Cleaning	Cleaning Service
Turtle Creek Park	Recreation	Osher Lifelong Learning Institute USD	School
Novus Auto Glass	Automotive	USD Science and Technology	School
Hartford Area Fire and Rescue	Emergency Services	Home Federal Bank	Bank
Creekside Meats	Grocery Store	Prairie Family Business Association	School
Hartford Area Chamber of commerce	Public Services	Walmart	Shopping/Grocery Store
Hartford Senior Citizens	Senior Center	Subway (Sioux Falls)	Restaurant

Name	Business Type	Name	Business Type
Joshua's Coffee House	Coffee Shop	Style Hair Salon	Salon
U.S. Bank Hartford Branch	Bank	Starbucks	Coffee Shop
American Legion	Legion	Jimmy John's	Restaurant
Laura Tjepkes Photography	Photographer	BP Gas Station	Gas Station
Golden West Telecommunications	Utility Provider	Northstar Grill and Pub	Restaurant
Hartford Library	Library	Dakota Lions Sight and Health	Non-profit Organization
Saint Ann and Saint George	Church	Dakota Digital	Electronic Parts Supplier
Miller Funeral Home	Funeral Home	Automatic Building Controls	Fire Alarm Supplier
Hartford Ace Hardware	Hardware Store	Glanbia Nutritionals	Nutrition
Tammen Auto and tire	Automotive	Forum Communications	Commercial Printer
Westpointe Townhomes	Apartments	Worthing Ag Parts	Agricultural Supplier
Dairy Queen	Restaurant	SpeedDee Delivery	Delivery/Shipping
St. George Cemetery	Cemetery	Titan Machinery	Farm Equipment
Haensel's Distributing Company	Retail Supply Store	Glow Aesthetics Med Spa	Spa Services
Zacharia's Construction	Aggregate Materials	Tinner's Public House	Bar & Grill
ALDI	Grocery Store		

A review of USFWS easements was conducted. Although there are easements present in the NEPA Study Area, no easements were present within the Project Study Area at the time of the writing of this document. The Voelker I WPA, owned in fee title by the USFWS, is located south of SD 38 in Section 14, Township 102 North, Range 52 West, east of Humboldt.

Future Land Use

As development continues in the area, land use will transition from rural to urban. The Minnehaha County 2035 Future Land Use Map anticipates that transition areas in Minnehaha County would have the primary purpose of maintaining the rural landscape until the eventual development of residential and/or municipal development (Minnehaha County 2015). The transition areas extend out from Sioux Falls, Hartford, and Harrisburg within the NEPA Study Area. The 2020 Census recorded a population of 197,214 and the 2024 estimated population of the county is 213,824. Large scale farming will still be permitted, but additional consideration should be given to types of agriculture such as large, concentrated animal feeding operations and agribusinesses to ensure that large investments are not made in areas of impending development (Minnehaha County 2015).

The Sioux Falls MPO boundary displays two growth areas, Sioux Falls and Hartford, within the NEPA Study Area. Transportation and availability of utilities have significant effects on growth. Within the Sioux Falls Growth Area, Shape Sioux Falls (2016) noted the area as transition from agricultural to urban. This transition has started to occur with construction of residential, commercial, and industrial areas. The interstate exit for Hartford is a prime location for business development due to the ease of access and close proximity to Sioux Falls (Minnehaha County 2015). Recreation and conservation zoned areas are planned for the future along Skunk Creek, south of SD 38 (Minnehaha County 2012). Future land use, development areas and growth areas are shown in **Figure 6**.

Hartford is starting to grow to the east, but elevations of the existing sanitary sewer collection system will not allow further expansion due to the existing topography (City of Hartford 2017). The Hartford Future Land Use map indicates development of commercial, industrial, parks and open space, and residential/rural growth areas surrounding Hartford (City of Hartford 2017). The Hartford WWTF is

under construction southwest of the SD 38 and I-90 interchange in Section 25, Township 102 North, Range 51 West. The WWTF will include, sewage lagoons, manholes, outlet pipes and influent force main crossing north across I-90. Future land use, development areas and growth areas are shown in **Figure 6**.

Humboldt's comprehensive plan contains a growth management strategy composed of goals and objectives. The goals and objectives encourage development and redevelopment within the existing city limits, direct new growth into designated future growth areas, construct and upgrade the major street system to handle new growth, improve community services for all residents of Humboldt, and preserve the function and character of the rural area (City of Humboldt 2003). The City of Humboldt's Future Land Use Map displays the development of residential growth areas, commercial areas, and industrial growth areas. Future land use, development areas and growth areas are shown in **Figure 6**.

Next Steps

The No Build Alternative is not consistent with land use plans; the acceptable LOS within the SD 38 corridor would not be maintained.

Development would be dependent upon the availability of utilities, resulting in a shift to urban land use resulting in higher traffic volumes. From this initial screening, Alternative 3 for the mainline corridor improvements and interchange improvements is consistent with the land use and economic growth in the area. Each project identified from the alternatives pulled forward for the mainline and interchange would be reviewed to determine if consistent with land use plans and economic growth patterns.

Construction of identified projects would cause traffic disruptions to residences and businesses along the corridor. Since there are no other means of access other than by SD 38, access to businesses and residences along the corridor would need to be considered during preliminary and final design. Businesses and residents along the route should be notified about construction activities in advance.

COMMUNITY AND SOCIAL RESOURCES

Transportation provides mobility and access for the daily activities of a community. As such, major changes to the transportation system may affect the various aspects of a community. The magnitude of the projected change is evaluated for each of the following social characteristics: population, public services and facilities, community character and cohesion, and traffic circulation.

Methodology

A desktop review and field reconnaissance were conducted to review the communities and resources present within the communities. In addition, the Sioux Falls traffic model and traffic analysis completed for the study were reviewed. A review of the traffic patterns for school districts, recreational areas, churches, emergency services, and rural residential areas was completed. A review for community cohesion was completed and considered the changes that would be beneficial or adverse such as splitting neighborhoods, generating new development, or separating residents from community facilities.

Existing Conditions

The majority of the population in Minnehaha County is concentrated in Sioux Falls, with over 90 percent of the total county population residing in the municipality. In a 2015 planning document, *Moving*

Forward, Planning Ahead, Envision 2035, it was projected that by the year 2035, the population of Minnehaha County would grow over 207,000; the projected population in 2024 is over 217,000. (Minnehaha County 2015). Between the years 2000 and 2010, Hartford had a population growth of 37 percent, growing from 1,844 to 2,534 with a population of 2,965 in 2015 (City of Hartford 2017), and a population of 3,359 in 2020, a 32.5 percent growth. Population growth in Hartford is the result of natural increase and net in-migration. Net in-migration occurs with the number of people moving into the community is larger than those leaving. Humboldt's population increased 11.3 percent from 1990 to 2000 from approximately 468 to 521 residents and is projected to have a population between 613 and 654 by the year 2025 (City of Humboldt 2003).

The NEPA Study Area crosses two school districts: the Sioux Falls School District and the West Central School District which encompasses Hartford, Humboldt, and the surrounding rural communities. The SD 38 corridor provides bus transportation routes for students of each district. The corridor also provides access for other public services such as emergency response vehicles, fire departments and police. Minnehaha County is served by thirteen volunteer fire departments and one full-time fire department within Sioux Falls (Minnehaha County 2015). Both Hartford and Humboldt have fire departments that serve the towns and rural communities. The City of Humboldt contracts with the Minnehaha County Sheriff's Office for its police services (Town of Humboldt 2023). The Minnehaha County Sheriff's office covers Minnehaha County including city limits where the individual cities do not maintain their own police services. The City of Hartford has its own police department that covers the Hartford city limits and the Sioux Falls Police Department covers the area within the Sioux Falls city limits.

SD 38 provides connectivity between the three municipalities of Hartford, Humboldt, and Sioux Falls, and direct access to several rural residential communities and destinations. Between Hartford and Sioux Falls there are two residential communities with direct access from SD 38 that do not associate with either city; the Hartford Heights Addition and Songbird Acres Addition. The Central Valley Golf Course lies in northeast Hartford directly adjacent to SD 38. A recreational racetrack, the I-90 Speedway, is accessed directly off SD 38 between Hartford and Humboldt. SD 38 also provides indirect access to recreational opportunities including city parks, baseball fields, and nature trails in both Hartford and Humboldt.

Next Steps

The No Build Alternative would not address the future decrease in LOS, therefore traffic would experience delays and increase safety concerns. The No Build Alternative would affect the connectivity of the communities and direct and indirect access to residential, business, and commercial areas.

Alternative 3 provides intersection improvements along the SD 38 corridor. Traffic numbers are projected to increase, and the proposed alignment would include but is not limited to additional lanes and roadway reconfigurations that will allow for a perpendicular entrance onto SD 38. A median would need to be incorporated for safety. The addition of lanes with a raised median may have a moderate effect to the traveling public due to the potential inability to directly drive in a wanted direction; a raised median may prohibit this action, forcing a commute to the next available turn-around intersection. However, the lanes, median, and perpendicular entrances would improve safety and accommodate traffic, having a benefit to the community and the traveling public. Alternative 3 would need to be evaluated with current social conditions and community settings.

The preferred interchange options allow for intersection configurations that would allow for a safer entrance onto SD 38 from I-90. Options for the interchange improvements adjust the lengths and skews of the interchange ramps for ease of use for vehicles using the interchange. The preferred options for the interchange improvement would need to be evaluated with current social conditions and community

settings.

TITLE VI/ENVIRONMENTAL JUSTICE

In compliance with EO 12898, SDDOT is required to reach out to minority and low-income populations with meaningful and expanded processes during transportation projects funded by FHWA. This EO requires federal agencies to achieve environmental justice by identifying and addressing disproportionately high and adverse human health or environmental effects, including the interrelated social and economic effects of their programs, policies, and activities, on minority populations and low-income populations in the United States.

Methodology

The methodology for this study addressed the methods for determining minority, people in poverty, vulnerable age, and Limited English Proficiency (LEP) populations. In accordance with U.S. Department of Transportation (DOT) Order 5610.2(A) and FHWA Order 6640.23A, a minority is defined as:

- Black: a person having origins in any of the black racial groups of Africa;
- Hispanic or Latino: a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race;
- Asian American: a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent;
- American Indian and Alaskan Native: a person having origins in any of the original people of North America, South America (including Central America), and who maintains cultural identification through tribal affiliation or community recognition; or
- Native Hawaiian and Other Pacific Islander: a person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands (FHWA June 14, 2012).

DOT and FHWA do not define children or elderly; the U.S. Census definitions of children and elderly are used in this study. Children are defined as age 17 years and under; elderly are defined as age 65 years and above.

DOT and FHWA define low-income as:

- A person whose median household income is at or below the Department of Health and Human Services (HHS) poverty guidelines. Poverty guidelines are a simplification of the poverty thresholds for administrative purposes—for instance, determining financial eligibility for certain federal programs. Poverty thresholds are used mainly for statistical purposes—for instance, preparing estimates of the number of Americans in poverty each year. Poverty population data are calculated using the poverty thresholds, not the guidelines.
- A low-income population is defined as any readily identifiable group of low-income persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed and transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed FHWA program, policy, or activity (FHWA June 14, 2012).

DOT defines LEP as individuals for whom English is not their primary language who have a limited ability to read, write, speak, or understand English.

The scale of the U.S. Census Bureau cartographic boundary files for which demographic and socioeconomic data are tracked allows for a two-tiered approach to the analysis at various scales. The 2020 Decennial U.S. Census was analyzed to determine the characteristics (minority, and age) of the

population in NEPA Study Area. Data were analyzed to the smallest geographic unit available, the Census block, for minorities and vulnerable ages. The U.S. Census block boundaries are generally small and confined to neighborhoods, and for this reason, the level of analysis for minority and vulnerable age populations was focused on just those census blocks near the NEPA Study Area.

The American Community Survey (ACS), an ongoing survey conducted by the U.S. Census Bureau, compiles income and language data annually. The smallest geographical unit available for ACS data is the Census block group. Data for income were collected for the Project Study Area using 5-year averages (2016 to 2020) at the block group level while LEP household data were gathered at census tract geographic units.

In accordance with FHWA Order 6640.23A, any readily identifiable group of minority or low-income persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed FHWA program, policy, or activity were identified. The population characteristics (minority, age, language spoken, and income) of the NEPA Study Area were compared to the characteristics of Minnehaha County to determine if there are substantial populations of minority, vulnerable age, LEP, or low-income residents.

FHWA defines a disproportionately high and adverse effect on minority and/or low-income populations as an adverse effect that:

- is predominately borne by a minority population and/or a low-income population, or
- would be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that would be suffered by the non-minority population and/or non-low-income population (FHWA, June 14, 2012).

FHWA Order 6640.23A does not define “any readily identifiable group.” Guidance developed by the Council on Environmental Quality (CEQ), who along with the US Environmental Protection Agency (EPA), has oversight responsibility for implementing EO 12898, identifies a minority and people in poverty populations when:

- The percentage of minorities or low-income residents, respectively, exceeds 50 percent of the population in the area affected by the Project, or
- The minority population percentage of the affected area is meaningfully (or substantially) greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (CEQ, December 10, 1997).

FHWA Order 6640.23A and other FHWA guidance do not use the term “meaningfully greater.” FHWA only uses the term “readily identifiable group” with regard to identifying a minority and/or low-income population. Based on CEQ and FHWA guidance, a two-step process was used to identify minority, low-income, and/or vulnerable age populations in the NEPA Study Area:

- Minority, low-income, and vulnerable age populations were initially evaluated to determine if the percentage of the population in the NEPA Study Area exceeds 50 percent of the total population.
- Minority, low-income, and vulnerable age populations were also evaluated by comparing their percentage in the NEPA Study Area to the percentage in Minnehaha County to determine if the minority, low-income, and/or vulnerable age populations in the NEPA Study Area are high and/or disproportionately greater than the same populations in the surrounding region. The NEPA Study Area was further analyzed at the Census block group and block levels to determine the distribution of any minority, low-income, and vulnerable age populations within the NEPA Study Area. Census block groups and blocks were determined to contain “substantial” minority, low-income, and vulnerable age populations if any of these populations

exhibited concentrations that were at least 40 percent higher than Minnehaha County's percentage of the same minority, low-income, and vulnerable age population. A 40 percent threshold represents a rounded value that is approximately the population within one standard deviation (34 percent) from the mean of a typical normal bell shape distribution curve.

Existing Conditions

Based on the U.S. Census blocks, 11,780 people lived in the U.S. Census blocks that intersect the NEPA Study Area in 2020 (USCB 2022). This estimate includes all people living within the Census block boundaries that intersect the NEPA Study Area, including adjacent neighborhoods to the Project that lie outside the NEPA Study Area boundary. Refer to **Table 13**.

Following the previously noted two-step process, no environmental justice or Title IV populations were present above 50 percent of the total populations. Environmental justice or Title IV populations were also not present above the 40 percent threshold in comparison to Minnehaha County. There were no meaningful or substantial populations of low-income, minority, age related, or below poverty populations identified within the NEPA Study Area.

Next Steps

The No Build Alternative would have no effect on environmental justice.

Currently, there are no meaningful or substantial environmental justice populations within the NEPA Study Area based off the 2020 census information. If a project occurs in the future and the new decennial census information of 2030 can be utilized, the presence of environmental justice populations should be reviewed. Otherwise, no further next steps are recommended.

Table 13. Census Data Comparisons

Census Parameter	Minnehaha County ¹	Threshold to Determine Population	NEPA Study Area ^{2,3}
Population	199,685	-	11,780
White	85.3%	-	90.4%
Hispanic/Latino	5.6%	7.8%	0.3%
Black/African American	6.6%	9.2%	0.02%
Asian	2.2%	3.1%	0.005%
American Indian/Alaskan Native	3.1%	4.3%	0.1%
Persons in Poverty	9.5%	13.3%	1.9%
Language other than English Spoken at Home	9.3%	13.0%	1.6%
Under Age 5	7.1%	9.9%	7.5%
Over Age 65	13.7%	19.2%	11.8%
Census Block Group 1 – Tract 103, Group 2 – Tract 103, Group 3 – Tract 103, Group 4 – Tract 103, Group 1 – Tract 104.06, Group 2 – Tract 104.04, Group 3 – Tract 104.05			
¹ USCB 2021 - Quick Facts - Minnehaha County			
² USBC 2022- 2020 Decennial Information			
³ ACS 2016 to 2020			

CLIMATE CHANGE/EQUITY

Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. Extreme weather or environmental conditions can pose threats to transportation infrastructure and those that depend on it by damaging infrastructure, disrupting transportation services, and creating safety risks for travelers. Temperature changes can cause pavement buckling, and increased rainfall intensity can lead to flooding, erosion, and slide events that damage transportation infrastructure. Climate related changes can result in increased costs, decreased efficiencies, and reduced reliability of transportation services. Sustainability of transportation infrastructure addresses the current needs in consideration of future needs by balancing economic, environmental, and social values.

The EO on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government (EO 13985) pursues a comprehensive approach to advancing equity for all, including individuals who have been historically underserved and adversely affected by persistent poverty or income inequality. An important area for focus is the disproportionate, adverse safety impacts that affect certain groups on our roadways.

Methodology

Climatic variation was reviewed from available weather information from the National Oceanic and Atmospheric Administration (NOAA).

The determined environmental justice populations within the NEPA Study Area were reviewed in comparison to the climatic variation, and any notable patterns in extreme weather events which are indicative of climatic change.

Existing Conditions

Weather, particularly precipitation, in the NEPA Study Area was reviewed. NOAA collects totals for inches of annual precipitation for Minnehaha County. In 2019, Minnehaha County recorded a record year for annual precipitation totaling 40.47 inches since 1895 (NOAA 2023). This led to a large-scale flooding that damaged residential homes and other property. Another high recent precipitation amounts includes 2018 with 37.52 inches (NOAA 2023).

No meaningful or substantial low-income, minority, age-related, or below poverty populations are present within the NEPA Study Area.

Next Steps

The No Build Alternative would likely cause negative effects to the corridor due to climate change. Infrastructure would continue to age and be affected by extreme weather events, temperature fluctuations, and other climate related factors. Maintenance costs would likely rise as repairs to the aging infrastructure are completed.

To address potential issues caused by climate change, SDDOT can integrate climate change considerations into planning, design, construction, and maintenance practices. Infrastructure can be designed with climate resilience in mind, including utilization of materials and construction techniques that can withstand extreme weather conditions and temperature fluctuations. Regular maintenance and monitoring could be conducted to address climate-related damage in a timely manner, focusing on adequate drainage systems, erosion prevention, and pavement repairs. By incorporating climate

change considerations, SDDOT can build more resilient infrastructure, improve the safety and reliability of transportation systems, and mitigate the adverse impacts of climate change on mobility and connectivity.

The No Build Alternative will have no impact on equity.

Currently, there are no meaningful or substantial environmental justice populations within the NEPA Study Area based off the 2020 census information. If a specific project extends into the new decennial census information of 2030, then the presence of environmental justice populations should be reviewed. Otherwise, no further next steps are recommended.

BICYCLE AND PEDESTRIAN FACILITIES

Bicycle and pedestrian facilities are important components in a community's transportation infrastructure. Promoting development of facilities for use by pedestrians and bicycles is important for consideration during transportation planning. Existing and planned bicycle and pedestrian facilities are summarized in this section.

Methodology

A desktop review was conducted to identify existing pedestrian and bicycle facilities located within the NEPA Study Area and to determine the locations of existing sidewalks, pedestrian bridges, footpaths, bike routes, and designated trails. A review of planning documents was also completed to identify what areas are designated currently and in the future for bicyclists and pedestrian use. Planning documents reviewed included: Sioux Falls Bike Plan 2015, Hartford Comprehensive Plan 2017 - 2037, Humboldt Comprehensive Plan 2003 – 2025, and Sioux Falls Metropolitan Planning Organization (MPO) Bicycle Plan.

Existing Conditions

Due to the primarily rural nature of the Project Study Area, paved and/or gravel shoulders serve as the primary opportunities for multi-modal users. SD 38 is identified to have decent pavement condition with approximately a 6-foot shoulder width from Hartford to SD 115. The on-street bike route is accommodating bicycle and pedestrian uses and was identified in the Sioux Falls MPO Bicycle Plan as providing connectivity from Hartford to Sioux Falls. Bike trails that parallel or intersect SD 38 are in the long-term, future trail category in the Sioux Falls Bike Plan. These trails are considered high-connectivity, low-comfort routes, due to the adequate, yet minimal shoulder width for users along a high-speed roadway (SFBP 2015). The following documents noted bicyclist and pedestrian trails:

- **Hartford Comprehensive Plan Parks and Open Space Map.** Within the Project Study Area, the plan and map discuss and display planning for future primary and secondary paths. This plan recommends expanding the existing bike path with consideration toward connection with the Sioux Falls System (City of Hartford 2017).
- **Humboldt Comprehensive Plan, Major Street Plan Map.** The plan and map discuss and display planning for future bike trails. In the southeast designated growth area of Humboldt, the implementation of a bike trail system along Interstate-90 is planned to act as a buffer between the interstate and residential development (City of Humboldt 2003).
- **MPO Bicycle Plan.** A future path was noted within the Project Study Area, exploring a bicycle trail connection from Hartford to the edge of Sioux Falls at either the west corridor, along Skunk Creek, or along another similar corridor (SFBP 2015).

Recommendations of the Sioux Falls MPO include roadway projects along SD 38 to improve bicycle and pedestrian accessibility between Sioux Falls and Hartford. Potential project locations include along Western Avenue from Mickelson Road to SD38, Western Avenue from SD38 to 258th Street, and a section line corridor next to the Sam Assam Development MPO, routing ¾ mile south of SD 38 (MPO 2020).

Next Steps

The No Build Alternative would affect bicycle and pedestrian users along the corridor. As traffic levels increase, users of the SD 38 shoulder for biking or walking would experience a lower comfort route than currently exists. However, if warranted, bicycle and pedestrian facilities could be constructed independently of a project stemming from this corridor study.

As projects from Alternative 3 and the I-90 Exit 390 Interchange Options proceed, the need for and future of recreational bicycle and pedestrian trail systems would be considered and be consistent with planning documents to the extent possible. Any accommodation for pedestrian and bicycle connectivity would be considered and finalized in future projects.

VISUAL RESOURCES AND AESTHETICS

Visual resources are the natural and cultural features of the landscape that define its aesthetic quality and form the overall impression, or visual character, of an area. Visual impacts can generally be defined in terms of the relationship between the area's physical characteristics, the presence and location of viewers, and the character and quality of the environment in which a project is located.

Methodology

The Project Study Area was reviewed during the field reconnaissance for the characteristics of the viewshed for the SD 38 corridor. The reconnaissance noted land uses and the following landscape features that add to the visual character of the area:

- Residential (urban, suburban, rural) uses
- Commercial, industrial, and municipal uses
- Parks, recreational areas, and trails
- Water and natural resources
- Agricultural open space and undeveloped lands

Existing Conditions

The NEPA and Project Study Areas overall occur in a largely rural area with agricultural uses dominating the landscape. The NEPA Study Area viewshed includes the SD 38 corridor and connecting roadways, residential areas including Humboldt, Hartford, and rural farmsteads, farm operations, and hobby farms. The landscape within the Project Study Area is primarily the SD 38 corridor, which traverses both urban and rural settings, passing rural residences and farmsteads with urbanization near the cities of such as Hartford, Humboldt, and Sioux Falls. Business and commercial areas are present within Hartford, Humboldt, Sioux Falls. One pedestrian trail is present along the north side of SD 38 between the Hartford Heights Addition and the City of Hartford. Additional pedestrian paths and sidewalks are present within the city limits of Hartford, Humboldt, and Sioux Falls.

Next Steps

The No Build Alternative would have no effect on visual resources or aesthetics in the Project Study Area.

The visual character of the Project Study Area would experience negligible effects from Alternative 3 and the selected I-90 Exit 390 Interchange option since the SD 38 corridor is currently part of the viewshed. Changes to the visual resources along the SD 38 corridor would consist of modifications to the existing roadway and interchange. Overall, effects to the viewshed would be negligible. No additional visual resource analysis is needed for upcoming projects.

PRIME AND UNIQUE FARMLANDS

Protecting farmland from conversion from agricultural use during the planning, construction, and maintenance of transportation projects is an important step in complying with the provisions of 7 CFR 658 et seq. Farmland Protection Policy Act (FPPA). In accordance with the FPPA, important farmland includes all land that is defined as prime, unique, or farmlands of statewide or local importance based on soil types. SDDOT identifies important farmland from currently published or interim soil survey maps and data produced and certified by the NRCS National Cooperative Soil Survey Program.

Methodology

The NRCS Web Soil Survey was utilized to identify types of soil within the Project Study Area, including prime, unique, and statewide and locally important farmlands (NRCS 2023a).

Existing Conditions

Multiple soil types exist within the Project Study Area. Refer to **Table 14** below for the soil name, acreage within the Project Study Area, and farmland designation (NRCS 2022b).

Table 14. Soil Types and Farmland Designations within the Project Study Area

Soil Map Unit Symbol, Name, and Slope	Acres in Study Area	Farmland Designation*
AcA – Alcester silty clay loam, 0 to 2 percent slopes	0.5	PF
Ba – Baltic silty clay loam, 0 to 1 percent slopes	14.1	None
Bb – Baltic silty clay loam, ponded	1.6	None
BeE – Betts-Ethan loams, 15 to 40 percent slopes	8.8	None
Cb – Chancellor silty clay loam, 0 to 2 percent slopes, frequently flooded	2.2	PF/D
Cc – Chancellor-Tetonka complex, 0 to 2 percent slopes	34.1	PF/D
Ch – Chaska loam, channeled, 0 to 3 percent slopes, frequently flooded	25.2	None
CsD – Crofton-Shindler complex, 9 to 15 percent slopes	12.1	None
Dd – Davison-Crossplain clay loams, 0 to 2 percent slopes	48.7	PF/D
DgC – Delmont-Talmo complex, 6 to 9 percent slopes	4.9	None
DmA – Dempster silt loam, 0 to 2 percent slopes	14.3	PF
DtB – Dempster-Talmo complex, 2 to 6 percent slopes	20.7	None
EaB – Egan-Ethan complex, 2 to 6 percent slopes	0.7	PF
EeB – Egan-Ethan-Trent complex, 1 to 6 percent slopes	204.9	PF
EfA – Egan-Trent silty clay loams, 0 to 2 percent slopes	12.0	PF
EgB – Egan-Wentworth-Trent complex, 2 to 6 percent slopes	30.6	PF
EtD – Ethan-Clamo loams, 9 to 15 percent slopes	23.7	None
EuC – Ethan-Egan complex, 6 to 9 percent slopes	112.8	SI

Soil Map Unit Symbol, Name, and Slope	Acres in Study Area	Farmland Designation*
HuA – Huntimer silty clay loam, 0 to 2 percent slopes	0.0	PF
La – Lamo silty clay loam, cool, 0 to 2 percent slopes	19.8	PF/D
Lb – Lamo silty clay loam, channeled	24.5	None
MnB – Moody-Nora complex, 2 to 6 percent slopes	131.3	PF
NcC – Nora-Crofton complex, 6 to 9 percent slopes	89.9	SI
Or – Orthents, loamy	2.4	None
SsF – Steinauer-Shindler clay loams, 25 to 60 percent slopes	1.0	None
TdE – Talmo-Delmont complex, 15 to 40 percent slopes	1.4	None
Tr – Trent silty clay loam, 0 to 3 percent slopes	3.3	PF
W – Water	1.7	None
Wa – Wakonda-Chancellor complex, 0 to 2 percent slopes	4.4	PF/D
WcA – Wentworth-Chancellor-Wakonda silty clay loams, 0 to 2 percent slopes	2.4	PF
WhA – Wentworth-Trent complex, 0 to 2 percent slopes	12.4	PF
Wk – Whitewood silty clay loam, 0 to 2 percent slopes, occasionally flooded	8.9	PF/D
Wo – Worthing silty clay loam, 0 to 1 percent slopes	6.8	None
Wr – Worthing-Davison complex, 0 to 2 percent slopes	21.0	None
Total Acreage	903.1	

*PF=Prime Farmland, PF/D=Prime Farmland if Drained, PF/I=Prime Farmland if Irrigated, SI=Farmland of Statewide Importance

Next Steps

The No Build Alternative will have no impacts on prime and unique farmlands.

Alternative 3 and the preferred improvements under the I-90 Exit 390 Interchange Options may impact prime farmland if ROW is needed. As the identified projects progress, the NRCS should be consulted to determine permanent impacts to soils with farmland designations. If needed, Form AD-1006, *Farmland Conversion Impact Rating*, would be completed for the specific project.

AIR QUALITY

Protecting air quality in the planning, construction, and maintenance of transportation projects is an important step in complying with provisions of 42 USC 7401 et seq., the Clean Air Act (CAA). The SDDANR Air Quality Program is responsible for maintaining air quality levels in South Dakota. It is responsible for air quality levels that protect human health, safety and welfare, and the National Ambient Air Quality Standards (NAAQS) established through the CAA.

Methodology

The most recent air quality assessment report (SDDANR 2020) was reviewed for levels of concern for particulate matter, ozone, nitrogen dioxide, lead, and carbon monoxide.

Existing Conditions

Currently, background levels of all assessed factors are within the CAA parameters; all of South Dakota is in attainment with CAA standards.

Next Steps

The No Build Alternative would have no impact on air quality.

Projects stemming from Alternative 3 and the preferred improvements under the I-90 Exit 390 Interchange Options are not anticipated to permanently impact air quality. The Project would be expected to have temporary local impacts to particulate levels (dust) during construction. Project specific analysis is not recommended due to the negligible effect to air quality.

HAZARDOUS MATERIALS

Hazardous materials include substances or materials that have been determined by the EPA to be capable of posing an unreasonable risk to health, safety, or property. Hazardous materials may exist within the study area at facilities that generate, store, or dispose of these substances, or at locations of past releases of these substances. Examples of hazardous materials include asbestos, lead-based paint, heavy metals, dry-cleaning solvents, and petroleum hydrocarbons (e.g., gasoline and diesel fuels), all of which could be harmful to human health and the environment.

Methodology

The SDDANR Tanks, Spills, and Environmental Events Map database was reviewed for registered aboveground and underground storage tanks, reported spill events, and any documented environmental events that may pose a risk or threat to the environment (SDDANR 2022).

Existing Conditions

Twelve reported spill events were identified within the Project Study Area (SDDANR 2024). All reported spill events within the Project Study Area were either closed or have been assigned a “no further action” status.

Four active underground storage tanks are located within the Project Study Area (SDDANR 2024). One is located southwest of the intersection of SD38 and 457th Avenue/S. Ford Street in Humboldt at the former Town N’ Country gas station. Two active underground storage tanks are located within the City of Hartford; one at the Get N Go gas station and one at the Heart T Stop. The fourth active storage tank is located at the Buffalo Ridge Country Store.

The SDDANR Tanks, Spills and Environmental Events interactive map identified no above ground storage tanks, Tier I facilities, or Tier II facilities within the Project Study Area.

Next Steps

The No Build Alternative will have no impact on hazardous materials.

Alternative 3 and the preferred improvements under the I-90 Exit 390 Interchange Options would largely utilize existing ROW and minimize soil disturbance to the extent necessary, thereby minimizing the potential for encountering hazardous materials.

Based on information currently available, projects that stem from this study would not likely impact or be impacted by hazardous materials. As future projects progress, an updated review of the SDDANR Tanks, Spills, and Environmental Events Map is recommended, along with SDDANR agency

coordination.

NOISE

Noise from highway traffic and construction is an important environmental consideration in transportation projects. SDDOT applies 23 CFR 772 for noise analysis and abatement procedures.

Highway projects fall into three types in accordance with the SDDOT Noise and Analysis Abatement Guidance (SDDOT 2011):

- Type I projects are defined as federal-aid highway projects in a new location or the physical alteration of an existing highway that significantly changes either the horizontal or vertical alignment or increases the number of through-traffic lanes. Type I projects can also include new or altered weigh stations, rest stops, ride-share lots, or toll plazas. Noise analysis is not required for the No Build Alternative or other eliminated alternatives.
- Type II projects are defined as federal-aid highway projects for noise abatement on an existing highway. For a Type II project to be eligible for Federal-aid funding, the highway agency must develop and implement a Type II program in accordance with section 772.71. Type II programs are voluntary, and SDDOT has elected not to have a Type II program.
- Type III projects are defined as federal-aid highway projects that do not meet the classifications of a Type I or Type II project. Type III projects do not require a noise analysis.

Methodology

For the purposes of this Environmental Screening Report, a full noise analysis study was not completed. A review to determine if an alternative would have additional through lanes or substantial horizontal or vertical alterations would be conducted as future projects are determined. If an alternative does have those components, then the proximity of the roadway alteration to noise receptors would be analyzed. A noise receptor is a discrete or representative location of a noise sensitive area. A substantial horizontal alteration is defined as one that halves the distance between the edge of the outermost through-traffic lane and the closest receptor between the existing condition and the future build condition. A substantial vertical alteration removes shielding, thereby exposing the line-of-site between the receptor and the traffic noise source (SDDOT 2011).

Existing Conditions

Noise receptors within the Project Study Area include the residences and businesses within Humboldt and Hartford, farmsteads, rural residences, and developments along the SD 38 Corridor. Refer to **Appendix B** for specific receptor locations.

Next Steps

Generally, a noise analysis is required for proposed projects that would physically alter an existing highway or increase the number of through-traffic lanes. If traffic noise impacts are identified and projected to increase with the incorporation of a future project in the study area, noise abatement measures may need to be evaluated for affected noise receptors.

The current design of Alternative 3 is not anticipated to require a noise analysis, either due to lack of

receptors or due to the distance of the proposed improvement not being half of the current distance to receptors. The preferred improvement of the I-90 Exit 390 Interchange Options include horizontal alteration of SD 38 at the I-90 interchange thus resulting in halving the distance to residential receptors. As projects move forward, the need for a noise analysis would be considered for each intersection and the proposed improvements to the I-90 interchange.

RIGHT-OF-WAY, ACQUISITION, AND RELOCATION POTENTIAL

The potential for Right-of-Way (ROW), acquisition, and relocation impacts are described in this section to evaluate how property owners and tenants (e.g., residential, business, non-profit, farm, ranch) may be directly and indirectly impacted by proposed ROW acquisition and associated business and residential displacements and relocations. The impacts may occur as a result of acquisition of specific businesses and residences or through disruption of business activity and neighborhood/community interaction characteristics that result in relocations.

Methodology

While specific ROW acquisitions or relocations are not finalized during this study, a desktop review was conducted to identify the existing ROW extents in comparison to the proposed improvements.

Existing Conditions

The SD 38 transportation corridor has an existing ROW throughout the Project Study Area. The typical width of the ROW along SD 38 ranges from approximately 100-200 feet on each side of the roadway. Portions of the ROW may exceed 200 feet in locations of large intersections and at the I-90 interchange. I-90 also has an existing ROW in which distances were unknown during the writing of this screening report. It is important to note that the location of fences, or other physical features on property boundaries may not determine the exact location of the ROW.

Next Steps

Alternative 3 and preferred improvements under the I-90 Exit 390 Interchange Options would require the acquisition of property within mainly agricultural land, pasture or row crops, and residences. Although the alternatives are anticipated to mostly be within the existing ROW acquisition is anticipated throughout the corridor. ROW acquisition amounts would later be determined during project design and development.

All ROW and relocation impacts would be mitigated in conformance with the Uniform Relocation Assistance and Real Property Acquisition Act (UA) of 1970, as amended by the Surface Transportation Assistance Act of 1987, and as codified in 49 Code of Federal Regulations (CFR) 24, effective April 1989. The SDDOT ROW program is responsible for acquiring the property necessary for highway purposes and performing services related to acquisition in accordance with the UA.

UTILITIES

Aboveground and buried utilities within the Project Study Area are outlined in this section.

Methodology

A field reconnaissance and desktop review were conducted to identify existing utilities in the area including, but not limited to, electric, gas, water, communication, and petroleum.

Existing Conditions

There are multiple utility companies and associated infrastructure along, under, and above SD 38 and adjacent county roads. Minnehaha County is traversed by high voltage transmission lines and liquid/vapor transmission pipelines, including the Dakota Access Pipeline (DAPL), which crosses the Project Study Area 0.3 mile west of the intersection of SD 38 and 460th Avenue. Utility service infrastructure can be associated with the SD 38 ROW, which extends up to 150 feet from the road centerline, and/or other special setback requirements related to utility maintenance and safety (LCCP 2005). Above ground pedestals, poles, junction boxes, and utility markers were observed adjacent to SD 38 throughout the Project Study Area.

Utilities observed in the study area during the field reconnaissance included, but are not limited to:

- Brookings Telephone Company – Fiber Optic Cable
- CenturyLink – Cable
- DAPL-ETCO Operations Management, LLC. – Petroleum Pipeline (Photo Point 26)
- East River Electric Power Cooperative – Fiber Optic Cable
- Golden West Telecommunications – Fiber Optic Cable
- Humboldt Natural Gas Utilities – Natural Gas Pipeline
- ITC Telcom – Buried Fiber Route
- Lewis & Clark Regional Water System, Inc. – Water Pipeline
- MidAmerican Energy – Natural Gas Pipeline
- Midcontinent Cable - Fiber Optic Cable
- Minnehaha Community Water Corporation – Water Lines and Valves
- Northwestern Bell Telephone Company – Underground Cable
- Sioux Valley Energy – Power Cable
- Sioux Valley Telephone Company – Telephone/Communication
- Union Telephone Company – Fiber Optic Cable

Next Steps

The Minnehaha County Planning Department should be contacted prior to any excavation, construction, or improvement activity to ensure that the Project would comply with Minnehaha County ordinance requirements.

Utility coordination would occur as part of the preliminary and final design of the identified projects that are part of Alternative 3 and the preferred improvements under the I-90 Exit 390 Interchange Options.

RAILROAD CROSSINGS

There is one inactive railroad grade within the Project Study Area along SD 38; the tracks have been removed from the grade. The inactive railroad grade crosses SD 38 in Humboldt approximately 0.55 miles west of the Project Study Area. The grade parallels the south side of SD 38 in the Project Study Area until it exits the Project Study Area at 466th Avenue, where it heads south towards Sioux Falls.

Methodology

The Federal Railroad Administration (FRA) maintains an inventory of crossings throughout the U.S. The FRA inventory indicates that there are 283 public and private highway/rail crossings within Minnehaha County (FRA 2023).

Existing Conditions

No railroad crossings exist along SD 38 within the Project Study Area.

Next Steps

The inactive railroad grade is listed as eligible on the NRHP. Measures to avoid impacts to the railroad grade should be implemented as projects progress.

OTHER ISSUES

No other issues were identified during this Environmental Screening Report.

REASONABLY FORESEEABLE EFFECTS

Reasonably foreseeable effects were considered within each resource section. Reasonably foreseeable actions must be advanced enough in the planning process that its implementation is likely. Reasonably foreseeable actions are not speculative, are likely to occur based on reliable sources, and are typically characterized in planning documents. The following are examples of the reasonably foreseeable effects:

- Water Resources - An increase in stormwater runoff may occur with changes to development and would need to be considered during final design. Pipe, culvert, and bridge structure sizing may need to be modified. Areas of floodplain, wetland, and stream corridors exist within the Project corridor and have the potential to be impacted by future improvement projects.
- Threatened or Endangered Species – Suitable habitat for the northern long-eared bat, Topeka shiner, and monarch butterfly exists in the Project Study Area. Coordination with USFWS would need to occur to determine specific project effects to species.
- Cultural Resources - A Level III survey would need to be completed in areas not previously disturbed to identify any historic structures or sites.
- Section 4(f) section notes the possibility of future trails qualifying as Section 4(f) resources; qualification will be dependent upon the progress of the completion of these trails during the timing of the Project.
- Land Use – Development and improvements of the SD 38 corridor would support future development in municipalities such as Hartford, Humbolt, and Sioux Falls. Future development between these municipalities is anticipated to continue due to the existing expansion of industrial, commercial and urban residential areas along the SD 38 corridor. Due to the future development along the SD 38 corridor, conversion of farmland and wildlife habitat could be anticipated. It is also likely that future land use planning and zoning may be reconfigured to accommodate developments and land use throughout the corridor.

SUMMARY OF NEXT STEPS AND MITIGATION STRATEGIES

The following is a list of follow up items that are needed during the NEPA process for each identified project:

- Wetland field delineations
- Approved jurisdictional determination from USACE
- Section 404 permit with a Section 401 State Water Quality Certification
 - o Depending upon level of impact, wetland mitigation may be required. Wetland credits would be purchased from a private wetland bank or, if available, debited from the SDDOT Wetland Mitigation Bank
- SDDANR General Permit for Construction Activities
- Coordination with USFWS and SDGFP to determine effects to threatened and endangered species
 - o Concurrence of effects to these species is required from USFWS
- Level III Cultural Resources Survey
 - o Consultation with SHPO to determine the Project's effect determination
- Identification of Section 4(f) and 6(f) properties
 - o Determination of any temporary or permanent use of the properties
- Consideration of access to residences and businesses during final design
- Review of the final design to confirm consistency with land use plans and economic growth patterns
- Consider the need for and future of recreational bicycle and pedestrian trail systems during final design
- Updated review of the SDDANR Tanks, Spills, and Environmental Map database, along with SDDANR agency coordination
- Review the need to complete a noise analysis for intersection at 270th Street
 - o If needed, complete analysis according to the SDDOT Noise Policy
- Mitigation of all ROW and relocation impacts in conformance with the Uniform Relocation Assistance and Real Property Acquisition Act (UA) of 1970.

STAKEHOLDER AND PUBLIC INVOLVEMENT

Two public meetings were held for the study and the following describes each.

First Public Meeting- June 8, 2023

The first public meeting and open house was on June 8th, 2023, at the West Central High School in Hartford, SD, 705 E 2nd St, Hartford, SD 57033. Approximately 44 people were in attendance. The public meeting was designed to inform the public about the study and solicit input early in the process. Representatives from SDDOT, FHWA, Minnehaha County, the City of Hartford, City of Humboldt, and personnel from the consultant engineering teams, including HR Green and Banner Associates, Inc., were present. The representatives were available to answer questions, discuss the study, and receive community input on study needs and deficiencies. A looping PowerPoint presentation was available for attendee viewing. A video was made available on the website to provide information and generate questions on design, environmental, right-of-way, and access management which are typical for most highway projects. Comments were made to the Design Team by email, comment cards, website contact form, online survey, and online interactive map. All comments will be reviewed by the Design Team for consideration in the design process.

The meeting was advertised through the study website (<https://www.sd38corridorstudy.com/>) and through direct mailings to landowners and local officials in and immediately adjacent to the corridor.

A total of 13 comments were received through the interactive map comments, one comment was received through the website, five comments were received through comment cards, and 21 comments were written on the strip map that were displayed at the Public Meeting. The main concern raised in the comments received was the speed, amount of traffic, and safety along SD 38. Comments identified traffic speeds entering Hartford should be reduced as crossing SD 38 or turning onto SD 38 is difficult. Flooding and drainage issues were listed as a concern that it would be ensured residences along the corridor would not be affected. One comment was received regarding wildlife vehicle collisions along SD 38. Other comments regarding safety included discussion on traffic signals, roundabouts, signage, turn lanes, and truck clearance.

Second Public Meeting- March 13th, 2024

The second public meeting and open house was on March 13th, 2024, at the West Central High School in Hartford, SD, 705 E 2nd St, Hartford, SD 57033. Approximately 30 people were in attendance. The public meeting was designed to inform the public about the study and solicit input early in the process. Representatives from SDDOT, FHWA, Minnehaha County, the City of Hartford, City of Humboldt, and personnel from the consultant engineering teams, including HR Green and Banner Associates, Inc., were present. The representatives were available to answer questions, discuss the study, and receive community input on study needs and deficiencies. A looping PowerPoint presentation was available for attendee viewing. A video was made available on the website to provide information and generate questions on design, environmental, right-of-way, and access management which are typical for most highway projects. Comments were made to the Design Team by email, comment cards, website contact form, online survey, and online interactive map. All comments will be reviewed by the Design Team for consideration in the design process.

The meeting was advertised through the study website (<https://www.sd38corridorstudy.com/>) and through direct mailings to landowners and local officials in and immediately adjacent to the corridor.

Twenty-one comments were received on the interactive map. Five handwritten comments and seven email comments were also received. The main concerns voiced at the public meeting were the median, a need for turn lanes at the racetrack, a speed limit reduction from the high school to the interstate, sight distance issues at the interchange, impacts to private driveways, acquisition of property, impacts to property values, changes in access locations, and impacts to businesses.

Throughout the course of the Project, all correspondence received from both public meetings was reviewed and logged. Comments submitted can be found in **Appendix C**.

CONCLUSION

Alternative 3 and the interchange improvements carried forward under the I-90 Exit 390 Interchange Options met the purpose and need for the Project and were carried forward for environmental analysis within this report. Resources or items of concern were identified within the NEPA Study Area or Project Study Area, depending on which was appropriate for that resource. Both Alternative 3 and the preferred improvements under the I-90 Exit 390 Interchange Options are anticipated to have minimal impacts to environmental resources. Future NEPA documentation would include the next steps identified for compliance as projects move forward.

Due to the minimal impact, the projects identified within Alternative 3 and the selected improvements

carried forward under the I-90 Exit 390 Interchange Options are anticipated to require Categorical Exclusions for NEPA documentation.

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APPENDIX C: PUBLIC ENGAGEMENT

SD38 Corridor Study



SD Department of Transportation
Public Meeting
June 8th, 2023

NH 0042(80)371, Minnehaha County, PCN 06YP
SD38 – From Humboldt to W of Marion Road in Sioux Falls
Corridor Study

The Public Meeting was held at West Central High School in Hartford, SD on June 8th, 2023. A video was made available on the website to provide information and generate questions on design, environmental, right-of-way, and access management which are typical for most highway projects.

Comments were made to the Design Team by email, comment cards, website contact form, online survey, and online interactive map. All comments will be reviewed by the Design Team for consideration in the design process.

Overview of Interactive Map Comments Received

All comments were submitted through the comment map on the Corridor Study's website. Their main concerns are speed, amount of traffic and safety. See attached for the Comment Map with location of these comments.

- Intersection of W North Street (Highway 38) and 456th Avenue (just west of Humboldt)
 - Submitted through interactive map (6/15/2023)
 - “Due to traffic coming from multiple directions at this intersection, consider an all-way stop, roundabout, or other traffic calming technique to improve safety.”
- Stretch of W North Street (Highway 38) between W 2nd Avenue and N Main Street in Humboldt
 - Submitted through interactive map (6/7/2023)
 - “Need to slow the speed down through town to 35 all the way west to 19”
- Stretch of Highway 38 between 460th Avenue and 259th Street
 - Submitted through interactive map (5/18/2023)
 - “Event traffic is a challenge for congestion”
- Highway 38 west of the intersection with Western Avenue (west of Hartford)

- Submitted through interactive map (6/15/2023)
 - “Traffic does not slow down coming into Hartford, making it difficult for multi-modal traffic to enter, exit, or cross Highway 38 at Western Avenue.”
- Intersection of Highway 38 and E Railroad Street/N Colton Road (east of West Central High School/Middle School in Hartford)
 - Submitted through interactive map (6/15/2023)
 - “The 90-degree-angle correction greatly improved safety at this intersection, but traffic on Highway 38 still creates safety concerns for cross traffic. Consider a traffic signal, roundabout, or other traffic calming technique at this intersection.”
- Intersection of Highway 38 and E Mickelson Road
 - Submitted through interactive map (6/15/2023)
 - “As development around this intersection continues to blossom, consider a traffic signal, roundabout, or other traffic calming technique to improve safety.”
 - Mark Heath (interactive map 6/7/2023)
 - “I have a safety concern. This intersection is very dangerous, especially for students attempting to turn west going to school at the same time commuters are driving east at 65+ mph. It will only get more difficult when the high density apartments are full. This is also dangerous when driving west on 38 from SF attempting to turn onto Mickelson. I feel like a sitting duck stopped on 38 hoping traffic behind me doesn’t rear end me at full speed.”
- Stretch of Highway 38 between Hartford and Interstate-90
 - Submitted through interactive map (6/15/2023)
 - “The speed limit of 65 MPH feels too fast for this stretch of Highway 38 near Hartford Heights, especially with the number and spacing of access points and the bike trail along the highway.”
- Highway 38 and Interstate-90 (east of Hartford)
 - Submitted through interactive map (6/5/2023)
 - “Traffic backs up here sometimes when cars are trying to enter I-90”
 - Submitted through interactive map (6/5/2023)
 - “Seeing cars coming east-bound (from Hartford) when exiting off the off-ramp into Hwy 38 is difficult.”
- Intersection of Highway 38 (West 60th Street) and N Ellis Road
 - Alysia Boysen (interactive map 6/26/2023)
 - “Add execution lanes at Ellis road so that traffic can safely merge onto hwy 38”

- West of the intersection of Highway 38 and N La Mesa Drive
 - Alysia Boysen (interactive map 6/26/2023)
 - “Flatten road so it is easier to see traffic heading East when turning off mesa.”
- West of the intersection of Highway 38/ West 60th Street and N Marion Road (Highway transitions from two-lane to four-lane)
 - Submitted through interactive map (6/5/2023)
 - “This four-lane section of hwy 38 is poorly lit up to the Marion Rd. intersection. This, combined with high speeds and a straight stretch of road all the way to the interstate makes the road ideal for racers and speeders. Many times I've witnessed cars blowing the red light at night, sometimes without headlights on or smoked-out headlights, making them difficult to see when making a legal crossing of hwy 38.”
- Intersection of West 54th Street and N Marion Road (south of Highway 38 and Marion Road intersection)
 - Submitted through interactive map (6/5/2023)
 - “Very difficult to see north-bound drivers on Marion Rd when trying to turn into Marion Rd from N 54th Street. There's a hill just south of Marion/N 54th that creates a very short sight-line. Perhaps a stop light is needed here?”
- Intersection of Highway 38/West 60th Street and North Career Avenue
 - Submitted through interactive map (6/5/2023)
 - “Stoplights are badly needed here. It's a large intersection and with development now north of Hwy 38. Vehicles tend to drive over 50mph on this road, so crossing hwy 38 is dangerous.”

Overview of Comments Received through the Website

- Linda Lambeth (website contact form 6/13/2023)
 - “Please do not wait until these future projects begin to fix this major problem. I have requested often that speed limit east of Humboldt be reduced and there has been no change. We are 1302 E North St which is actually Hwy 38...1mile east of Humboldt. There are 8 additional residences in the mile into Humboldt and the current 65 mile speed limit (reduced to 55 just before Hwy 19 north) is toooooo fast. This is a popular crossing for deer from Beaver Lake to the north with many killed each year. It is dangerous at time pulling out of our driveway onto Hwy 38 with speeding vehicles coming from Humboldt. Please pass this on to whichever agency can fix this!”

Overview of Comment Cards Received

All comments were from residents who attended the Public Meeting held on June 8th, 2023 at West Central High School in Humboldt. Their main concerns are speed and safety.

- Paul Dyke
 - “Right turn lane needed (heading west) at 468th St. intersection.”
- Joel Tews
 - “Hwy 38 and 19 intersection is very dangerous. Not sure what to do just an observation.”
- Rod Kramer
 - “Should be a sign that cross traffic doesn’t stop where Hwy 19 meets 38 by Friendly’s in Humboldt.”
- Brent Hoffman
 - “Many residents feel the north end of the I-90/Hwy 38 interchange is inherently unsafe, largely due to vehicles pulling onto Hwy 38 from the off-ramp but there are also concerns about vehicles approaching from the east because of the line of sight. If the road could be widened and lowered through there, it would improve visibility. There are similar concerns about the Hwy38 connection with Mickelson and some residents have suggested the roadway could be lowered and/or the curve smoothed out. Thanks for the opportunity to comment. Sen. Hoffman (D-9)”
- Peggy Hoogestraat
 - “I attended the June 8 meeting in Hartford and already left comments. Later, I was told by my son, Matt, who travels the corridor more than I, that a great concern for the neighborhood is the traffic entering and leaving the race track. Safety for all is so important. Thank you for involving the communities. Peggy”

Overview of Comments on Strip Maps from the Public Meeting

All comments were written on the strip maps that were displayed at the Public Meeting held on June 8th, 2023 at West Central High School in Humboldt. Their main concerns are speed, amount of traffic and safety.

- SW corner of Hwy 38 and 457th Avenue—east of Humboldt
 - City Utility/Drainage work
- SE corner of Hwy 38 and 457th Avenue—east of Humboldt
 - Drains into back lot line ditch
- NE corner of Hwy 38 and Hwy 19—east of Humboldt
 - Truck cannot make turn (west bound from Hwy 38 turning north on Hwy 19)
- 459th Avenue south of Hwy 38
 - Curvy Road

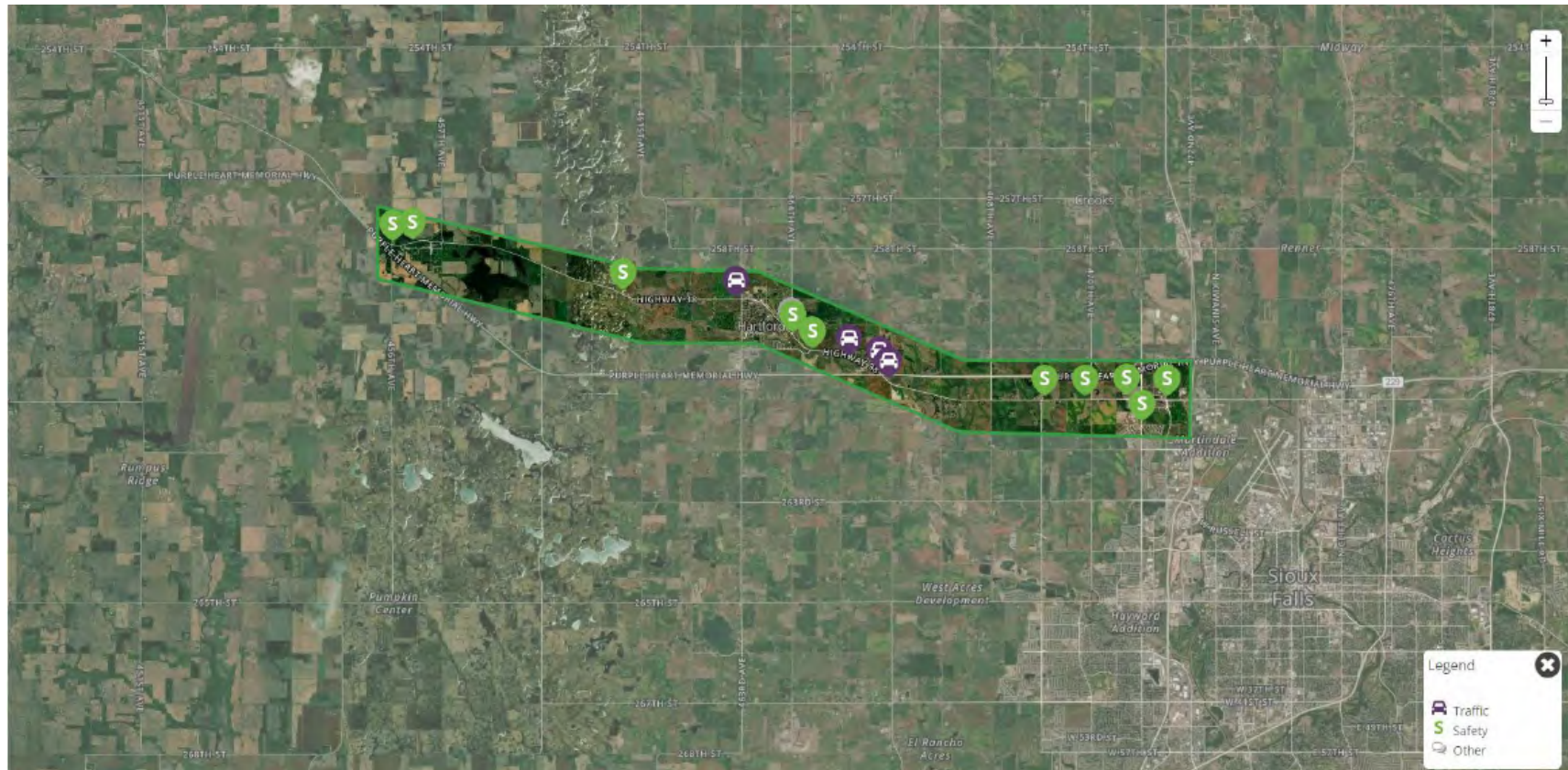
- Mid-point between 459th Avenue and 460th Avenue along Hwy 38
 - Sight-line issues
 - Seasonal seed-sales business on the north side of Hwy 38
 - Drain tiles in the field to the south
 - Rural water utility line (east to west) approximately 2,500 ft south of Hwy 38
 - Approximately 1,700 ft west of 460th Avenue is a DAPL Access Easement
 - Field Access points near this easement
- Hwy 38 and 460th Avenue Intersection
 - Notes of crashes and to “check past crash data” to the west of the intersection.
 - 460th Avenue south of the intersection has the following note:
 - “Low to no maintenance road, difficult to drive on with equipment”
 - Field work and access at the intersection of 259th Street and 460th Avenue
 - “Field Work” notes along the west side of 460th Avenue (south of the Hwy 38 intersection)
- Intersection of Hwy 38 and 259th Street
 - Field work access
 - Illegible note
- Intersection of 258th Street and 463rd Avenue—north of Hartford
 - NW corner: carbon pipeline
- Approximately 3,200 feet west of Hwy 38 and Western Avenue intersection (west of Hartford)
 - “Carbon pipeline?”
- Hwy 38 and Western Avenue Intersection
 - “Trucks from Humbolt off @ Humbolt Ex to c of low clearance at Western/I90”
 - “Traffic increases as detour for interstate (I-90) when construction on I-90”
- 463rd Avenue/Western Avenue and I-90 Overpass
 - “Turbine/silo trucks cannot fit under this”
- Hartford
 - Hwy 39 and Vandemark Avenue
 - Daycare NW corner
 - Shopping center on NE corner
 - Freyder Avenue and 1st Street
 - Elementary School traffic
 - East of the intersection of Hwy 38 and Elm Road
 - “Now ROW take”
 - Hwy 38 and East 2nd Street intersection – Middle and High School
 - Need left or right turn lanes at this intersection
 - School and several access routes are denoted with arrows
 - Approximately 350 cars/day
 - Open campus at lunch
 - Bus route along 2nd Street
 - Crossing zone across Hwy 38 for students
 - NW bound traffic along Hwy 38 turning left into the school causes bottleneck

- East of Hartford
 - Hwy 38 and 260th Street intersection is circled—no note
 - New Addition going in north of existing lots on north side of intersection
 - Right turn lane?
 - Left turn lane along Hwy 38?
 - Stretch between 260th Street and 465th Avenue
 - “Put more speed limit signs. 65-not 52”
 - “Speed limit needs to be reviewed”
- Hwy 38 and 261st Street Intersection
- Note of “rear-end” with left turns Hwy 38 and Middle Drive
 - “Hard to see to turn off—have to wait. Crashed at this location”
- Hwy 38 and 261st Street Intersection
 - Note of “rear-end” with left turns
- Interstate 90 and Hwy 38
 - Dashes along the SW side of Hwy 38—no note
 - “Turbine/Silo trucks enter I90 here from Humboldt to go East”
 - “Turbine/Silo get off here to go west”
- NW of Interstate 90 and Hwy 38
 - Gravel yard—lots of large trucks
 - Add a turn lane for trucks
- Hwy 38 and 467th Street Intersection
 - “Speed limit needs to be reviewed”
- Hwy 38 and 468th Avenue Intersection
 - “Right turn lane needed” for west bound traffic turning north
- Hwy 38 and Pheasant Run Avenue Intersection
 - “Concern for LT safety”
 - Approximately 1,000 ft south of intersection “Bicentennial Homestead (1872)”

See attached for summary of online survey results.

Comment Map from SD38 Corridor Study Website

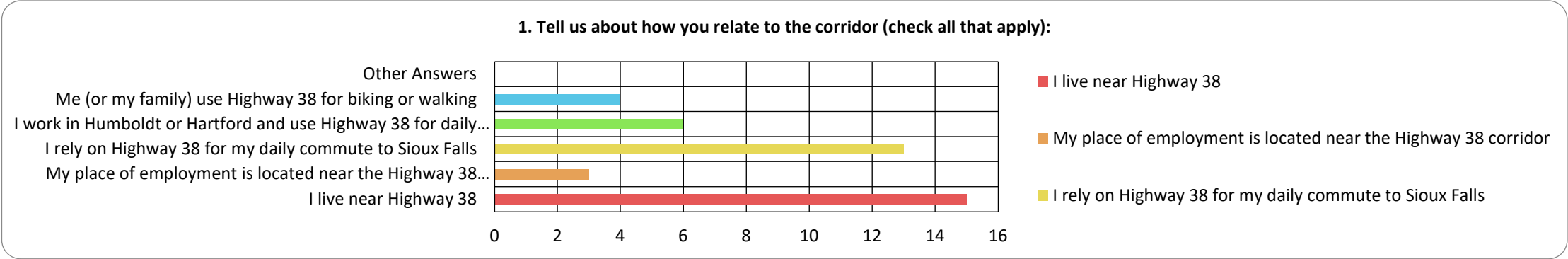
08-18-2023



SD 38 Corridor Study

1. Tell us about how you relate to the corridor (check all that apply):

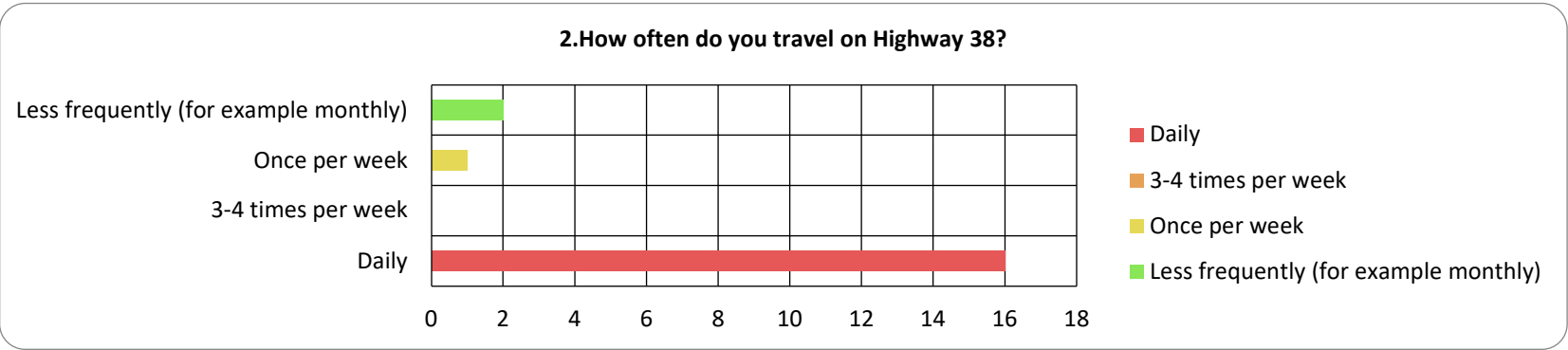
Choice	Responses	
I live near Highway 38	15	78.95%
My place of employment is located near the Highway 38 corridor	3	15.79%
I rely on Highway 38 for my daily commute to Sioux Falls	13	68.42%
I work in Humboldt or Hartford and use Highway 38 for daily needs	6	31.58%
Me (or my family) use Highway 38 for biking or walking	4	21.05%
Other Answers	0	0.00%
Answered	19	
Skipped	0	



SD 38 Corridor Study

2.How often do you travel on Highway 38?

Choice	Responses	
Daily	16	84.21%
3-4 times per week	0	0.00%
Once per week	1	5.26%
Less frequently (for example monthly)	2	10.53%
Answered	19	
Skipped	0	



SD 38 Corridor Study

3. What would you like improved on Highway 38? Please rank based on high priority and low priority.

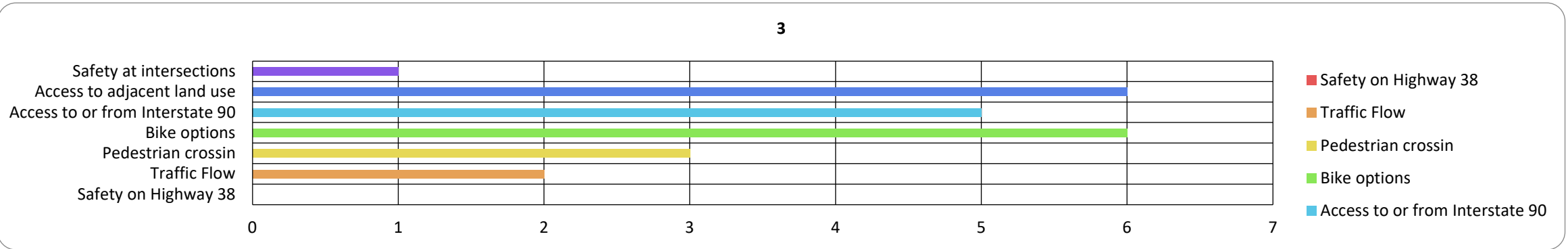
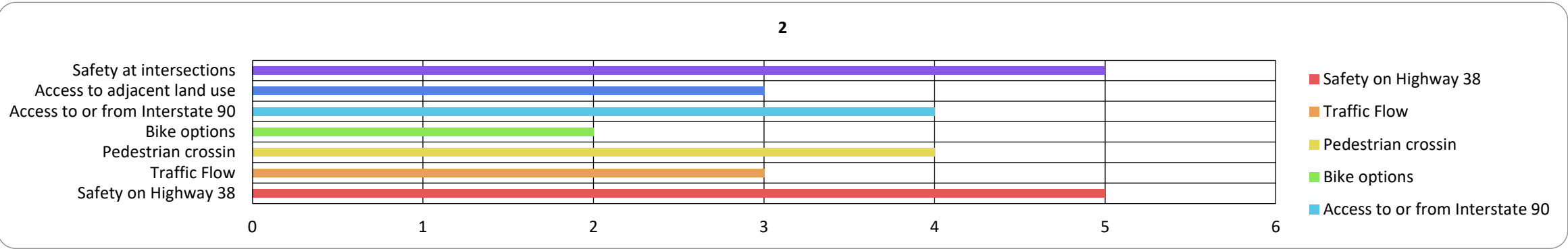
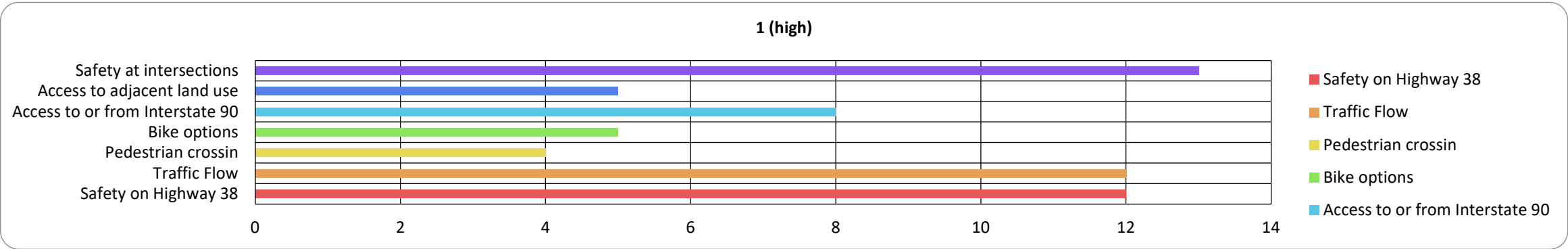
	1 (high)		2		3		4		5 (low)	
Safety on Highway 38	12	63.16%	5	26.32%	0	0.00%	1	5.26%	1	5.26%
Traffic Flow	12	63.16%	3	15.79%	2	10.53%	2	10.53%	0	0.00%
Pedestrian crossin	4	21.05%	4	21.05%	3	15.79%	4	21.05%	4	21.05%
Bike options	5	26.32%	2	10.53%	6	31.58%	3	15.79%	3	15.79%
Access to or from Interstate 90	8	42.11%	4	21.05%	5	26.32%	1	5.26%	1	5.26%
Access to adjacent land use	5	26.32%	3	15.79%	6	31.58%	2	10.53%	3	15.79%
Safety at intersections	13	68.42%	5	26.32%	1	5.26%	0	0.00%	0	0.00%

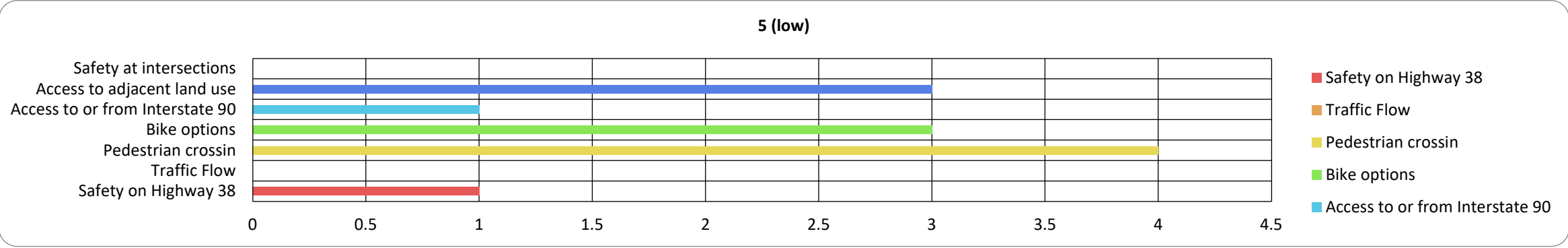
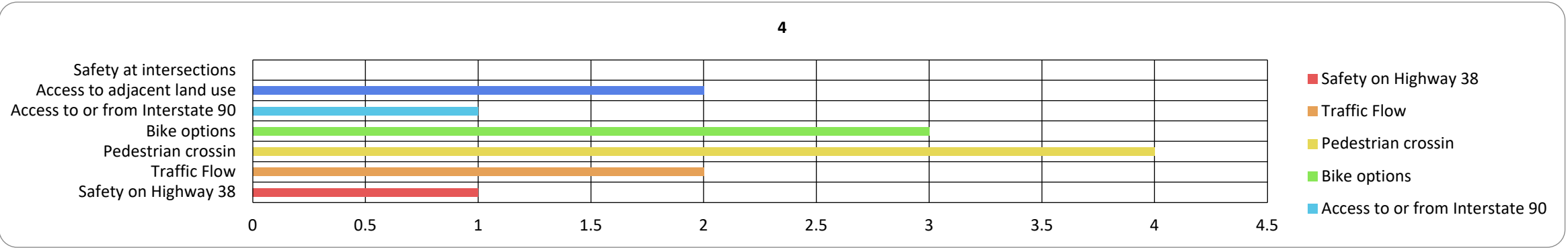
Answered

19

Skipped

0





SD 38 Corridor Study

4.If I could fix one thing about the Highway 38 corridor, it would be:

Response

- Lack of visibility at the exit near buffalo ridge
- The on ramp and off ramp of the first Hartford Exit on I-90.
- Exiting off I90 to 38 needs to be improved. Blind intersection cars pull out and drive 45mph instead of posted speed limit
- Turning lanes at all locations for high traffic areas.
- Need turning lane
- Turning west (right) onto Highway 38 from the I 90 westbound offramp is terrible. You basically have to guess if cars are coming or not. From 38 you often have to slam on the brakes for turning traffic
- The road condition
- Turn lanes
- Traffic calming through Hartford and Humboldt.
- More room to pass. Lot of semi-trucks and other slow moving vehicles obstruct lane visibility and make it unsafe to pass on many portions of SD 38
- The intersection of 38 and Mickelson needs to be redesigned. I feel very unsettled with my teenage drivers and the rest of the kids in our community using that intersection daily.
- Slow down thru humboldt
- Turn lane by mickelson Road
- Safety at Marion Rd and Hwy 38 and improve the on-/off-ramps at I-90 and Hwy 38.

Answered	14
Skipped	5



SIGN-IN SHEET

Subject:	HP 5596(25)P, Minnehaha County		
Client:	South Dakota Department of Transportation		
Project:	SD 38 Corridor Study from Humboldt to Sioux Falls		
Meeting Date:	June 8th, 2023, 5:30 pm to 7:30 pm	Meeting Location:	West Central High School

Please print clearly. Thank you.

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