



LSC TRANSPORTATION CONSULTANTS, INC.

**1889 York Street
Denver, CO 80206
(303) 333-1105
FAX (303) 333-1107
E-mail: lsc@lscdenver.com**

August 2, 2022

Ms. Kristi McRedmond
Ascent Geomatic Solutions
8620 Wolff Court
Westminster, CO 80031

Re: PDC - Denali Pad
Traffic Impact Analysis
Greeley, CO
LSC #220690

Dear Ms. McRedmond:

In response to your request, LSC Transportation Consultants, Inc. has prepared this Traffic Impact Analysis for the proposed PDC - Denali pad well site in Greeley, Colorado. The site is located south of US 34 and west of 95th Avenue as shown in Figure 1.

REPORT CONTENTS

The report contains the following: the existing roadway and traffic conditions in the vicinity of the site including the lane geometries, traffic controls, etc.; the existing weekday peak-hour traffic volumes; the existing daily traffic volumes in the area; the typical weekday site-generated traffic volume projections for site; the assignment of the projected traffic volumes to the area roadways; the projected total traffic volumes on the area roadways; the site's projected traffic impacts; and any recommended roadway improvements to mitigate the traffic impacts from the site. The estimated timing of each phase is the best information available today but is subject to change over time.

LAND USE AND ACCESS

The site is proposed as an oil and gas operation with 32 well heads. Full movement access is proposed to Litho Park Drive via an existing private access road as shown in Figure 2.

The site will be developed in 6 phases as follows:

- | | |
|---|---------|
| 1. Construction Phase 1 (Earthwork of site and access road) | 20 days |
| 2. Construction Phase 2 (Finishing work and access road construction) | 10 days |
| 3. Drilling Phase | 90 days |
| 4. Completion Phase | 90 days |
| 5. Flow Back Phase | 60 days |
| 6. Production/Operations | Ongoing |

These 6 phases are detailed in Table 1.

ROADWAY AND TRAFFIC CONDITIONS

Area Roadways

The major roadways in the site's vicinity are shown on Figure 1 and are described below.

- **US Highway 34** is an east-west, four-lane highway north of the site. It is classified as an Expressway (E-X) by CDOT. The intersection with 83rd Avenue is signalized with auxiliary turn lanes and the intersection with 95th Avenue is unsignalized with auxiliary turn lanes. The posted speed limit is 65 mph near the study area.
- **W. 37th Street** is an east-west, two-lane paved roadway south of the site. The intersection with 95th Avenue is stop-sign controlled with no auxiliary lanes. The posted speed limit in the vicinity of the site is 45 mph near 95th Avenue and reduces to 35 mph at 77th Avenue (Two Rivers Parkway).
- **83rd Avenue** is a north-south, two-lane paved roadway east of the site. The intersection with US Highway 34 is signalized with auxiliary turn lanes. The posted speed limit in the vicinity of the site is 40 mph.
- **95th Avenue** is a north-south, two-lane paved roadway east of the site. The intersections with US Highway 34 (Business) and W. 37th Avenue are stop-sign controlled with auxiliary turn lanes. No speed limit is posted in the vicinity of the site.
- **Existing or Proposed Private Access Roads** are gravel roadways that will provide access to the site from the public roadway network. They will be maintained to accommodate construction traffic.

Existing Traffic Conditions

Figure 3 shows the existing weekday traffic volumes, lane geometry, traffic controls, and the posted speed limits in the vicinity of the site. The weekday peak-hour traffic volumes and average daily traffic volumes are from the attached traffic counts conducted by Counter Measures in July, 2022.

2023 Background Traffic

Figure 4 shows the 2023 background traffic volumes which assumes an annual growth rate of three percent to maintain a conservative analysis.

Existing and 2023 Background Levels of Service

Level of service (LOS) is a quantitative measure of the level of congestion or delay at an intersection. Level of service is indicated on a scale from "A" to "F." LOS A is indicative of little congestion or delay and LOS F is indicative of a high level of congestion or delay. Attached are specific level of service definitions for signalized and unsignalized intersections.

The intersections in the study area were analyzed to determine the existing and 2023 background levels of service using Synchro. Table 2 shows the level of service analysis results. The level of service reports are attached.

- **US 34/95th Avenue:** All movements at this unsignalized intersection currently operate at LOS “C” or better during both morning and afternoon peak-hours and are expected to do so through 2023 with the following exceptions: The northbound and southbound approaches operate at LOS “F” based on poor operations from the side road left-turn and through movements.
- **95th Avenue/W. 37th Street:** All movements at this unsignalized intersection currently operate at LOS “B” or better during both morning and afternoon peak-hours and are expected to do so through 2023.
- **US 34/83rd Avenue:** This signalized intersection currently operates at an overall LOS “C” during both morning and afternoon peak-hours and is expected to do so through 2023.
- **83rd Avenue/W. 37th Street:** All movements at this unsignalized intersection currently operate at LOS “C” or better during both morning and afternoon peak-hours and are expected to do so through 2023 with the following exceptions: The northbound approach operates at LOS “E” in the afternoon peak-hour. The southbound approach operates at LOS “F” in the afternoon peak-hour.

TRIP GENERATION

Table 3 shows the estimated average weekday daily and peak-hour trip generation by vehicle type based on information provided by the applicant. Estimates are given for 6 different phases of the project including:

1. Construction Phase 1 (Earthwork of site and access road)
2. Construction Phase 2 (Finishing work and access road construction)
3. Drilling Phase
4. Completion Phase
5. Flow Back Phase
6. Production/Operations

The highest trip generating phase is Construction Phase 2 with about 208 average one-way trips per day.

DIRECTIONAL DISTRIBUTION

Figure 5 shows the estimated directional distribution of the site-generated traffic volumes on the area roadways. The estimates were based on the location of the site with respect to the regional population, employment, and activity centers; and the site’s proposed land use.

TRIP ASSIGNMENT

Figure 6 shows the estimated 2023 assignment of the site-generated traffic in passenger car equivalents for the highest trip generating scenario (Construction Phase 2).

TOTAL TRAFFIC

Figure 7 shows the 2023 total traffic, lane geometry, and traffic control which is the sum of the 2023 background traffic (Figure 4) and the 2023 assignment (Figure 6).

PROJECTED LEVELS OF SERVICE

The intersections in the study area were analyzed as appropriate to determine the total levels of service during the busiest scenario detailed above. Table 2 shows the level of service analysis results. The level of service reports are attached.

- **US 34/95th Avenue:** All movements at this unsignalized intersection are expected to operate at LOS “C” or better during both morning and afternoon peak-hours through 2023 with the following exceptions: The northbound and southbound approaches operate at LOS “F” based on poor operations from the side road left-turn and through movements.
- **95th Avenue/W. 37th Street:** All movements at this unsignalized intersection are expected to operate at LOS “B” or better during both morning and afternoon peak-hours through 2023.
- **US 34/83rd Avenue:** This signalized intersection is expected to operate at LOS “C” during both morning and afternoon peak-hours through 2023.
- **83rd Avenue/W. 37th Street:** All movements at this unsignalized intersection are expected to operate at LOS “C” or better during both morning and afternoon peak-hours through 2023 with the following exceptions: The northbound approach is expected to operate at LOS “E” in the afternoon peak-hour and the southbound approach is expected to operate at LOS “F” in the afternoon peak-hour.

CONCLUSIONS AND RECOMMENDATIONS

Trip Generation

1. The impact will be highest at about 208 passenger car equivalent trips per day in Scenario 2 (Construction Phase 2 - 10 days).
2. The long-term impact will be minimal due to product being removed from the site via pipeline.

Projected Levels of Service

3. All movements at the unsignalized intersection analyzed are expected to operate at LOS "C" or better during both morning and afternoon peak-hours through 2023 with the following exceptions: At the US 34/95th Avenue, the northbound and southbound approaches operate at LOS "F" based on poor operations from the side road left-turn and through movements. At the 83rd Avenue/W. 37th Street intersection, the northbound approach is expected to operate at LOS "E" in the afternoon peak-hour and the southbound approach is expected to operate at LOS "F" in the afternoon peak-hour.
4. The signalized US 34/83rd Avenue intersection is expected to operate at LOS "C" during both morning and afternoon peak-hours through 2023.

Conclusions

5. The impact of the proposed PDC - Denali Pad well site can be accommodated by the existing roadway network with the following recommendations.

Recommendations

6. A traffic control plan indicating heavy turning truck trips would be appropriate during construction of the site.

* * * * *

We trust our findings will assist you in gaining approval of the proposed PDC - Denali Pad well site development. Please contact me if you have any questions or need further assistance.

Sincerely,

LSC TRANSPORTATION CONSULTANTS, INC.

By


Christopher S. McGranahan, PE, PTOE
Principal

CSM/wc

8-2-22

Enclosures: Tables 1 - 3
Figures 1 - 7
Traffic Count Reports
Level of Service Definitions
Level of Service Reports

Table 1
PDC Energy Well Sites
Trip Generation Estimate ⁽¹⁾

Phase of Development	Gross Vehicle Weight		Number of Vehicles Estimated per Day ⁽¹⁾		Average Daily Trips	AM Peak		PM Peak		
						In	Out	In	Out	
Construction Phase 1 (20 days +/-) - Earthwork of site and access road										
Passenger Vehicle ⁽²⁾	4,500	to 8,500 lbs	4	Vehicles	8	2	1	1	2	
Single Unit Trucks ⁽²⁾	10,000	to 20,000 lbs	4	Vehicles	8	2	1	1	2	
Multiple Unit Trucks ⁽²⁾	50,000	to 70,000 lbs	10	Vehicles	20	2	2	2	2	
Typical Vehicle Trips per Day =					36	6	4	4	6	
Typical Passenger Car Equivalent Trips per Day ⁽³⁾ =					84					
Construction Phase 2 (10 days +/-) - Finishing work and access road construction										
Passenger Vehicle ⁽²⁾	4,500	to 8,500 lbs	10	Vehicles	20	1	1	1	1	
Single Unit Trucks ⁽²⁾	10,000	to 20,000 lbs	2	Vehicles	4	0	0	0	0	
Multiple Unit Trucks ⁽²⁾	50,000	to 70,000 lbs	30	Vehicles	60	4	4	4	4	
Typical Vehicle Trips per Day =					84	5	5	5	5	
Typical Passenger Car Equivalent Trips per Day ⁽³⁾ =					208					
Drilling Phase (90 days +/-) - Workers live on the site										
Passenger Vehicle ⁽²⁾	4,500	to 8,500 lbs	12-15	Vehicles	30	2	2	2	2	
Single Unit Trucks ⁽²⁾	10,000	to 20,000 lbs	3-5	Vehicles	10	1	1	1	1	
Multiple Unit Trucks ⁽²⁾	50,000	to 70,000 lbs	3-5	Vehicles	10	1	1	1	1	
Typical Vehicle Trips per Day =					50	4	4	4	4	
Typical Passenger Car Equivalent Trips per Day ⁽³⁾ =					80					
Completion Phase (90 days +/-) - Workers arrive on bus to reduce trips to/from the site - Water will be delivered via pipeline										
Passenger Vehicle	4,500	to 8,500 lbs	20	Vehicles	40	2	2	2	2	
Single Unit Trucks	10,000	to 20,000 lbs	1	Vehicles	2					
Multiple Unit Trucks	50,000	to 70,000 lbs	0 or 120 ⁽⁴⁾	Vehicles	0 or 240	0	0	0	0	
Typical Vehicle Trips per Day =					42 or 282	2	2	2	2	
Typical Passenger Car Equivalent Trips per Day =					42 or 764					
Flow Back Phase (60 days +/-)										
Passenger Vehicle	4,500	to 8,500 lbs	1	Vehicles	2	0	0	0	0	
Single Unit Trucks	10,000	to 20,000 lbs	1	Vehicles	2	0	0	0	0	
Multiple Unit Trucks	50,000	to 70,000 lbs	10	Vehicles	20	2	2	2	2	
Typical Vehicle Trips per Day =					24	2	2	2	2	
Typical Passenger Car Equivalent Trips per Day =					66					
Production/Operation Phase (Product will be transferred via pipeline)										
Passenger Vehicle	4,500	to 8,500 lbs	1	Vehicles	2	0	0	0	0	
Single Unit Trucks	10,000	to 20,000 lbs	0	Vehicles	0	0	0	0	0	
Multiple Unit Trucks	50,000	to 70,000 lbs	0	Vehicles	0	0	0	0	0	
Typical Vehicle Trips per Day =					2	0	0	0	0	
Typical Passenger Car Equivalent Trips per Day =					2					

Notes:

(1) Estimate based on coordination with PDC

(2) CDOT *State Highway Access Code* (SHAC) assumes: passenger vehicle < 20', single unit truck from 20' to 40', multiple unit truck > 40'

(3) CDOT SHAC assumes single unit trucks = 2 passenger car equivalents and multiple unit trucks = 3 passenger car equivalents

(4) 0 = water from temporary pipeline; 120 = water trucked to site

Source: LSC Transportation Consultants, Inc. based on input from PDC

Table 2
Intersection Levels of Service Analysis
PDC Denali
Greeley, CO
LSC #220690; August, 2022

Intersection Location	Traffic Control	Existing Traffic		2023 Background Traffic		2023 Total Traffic	
		Level of Service	Level of Service	Level of Service	Level of Service	Level of Service	Level of Service
		AM	PM	AM	PM	AM	PM
<u>US 34/95th Avenue</u>	TWSC						
NB Approach		F	F	F	F	F	F
EB Left		C	C	C	C	C	C
WB Left		A	B	A	B	A	B
SB Approach		F	F	F	F	F	F
Critical Movement Delay (sec/veh)		>240	>240	>240	>240	>240	>240
<u>95th Avenue/W. 37th Street</u>	TWSC						
NB Approach		B	B	B	B	B	B
EB Approach		A	A	A	A	A	A
WB Approach		A	A	A	A	A	A
SB Approach		B	B	B	B	B	B
Critical Movement Delay (sec/veh)		11.2	13.8	11.3	14.1	11.3	12.8
<u>US 34/83rd Avenue</u>	Signalized						
EB Left		D	E	D	E	D	E
EB Through		B	C	B	C	B	C
EB Right		A	A	A	A	A	A
WB Left		E	E	E	E	E	E
WB Through		B	C	B	C	C	C
WB Right		A	A	A	A	A	A
NB Left/Through		D	E	D	F	D	F
NB Right		A	A	A	A	A	A
SB Left/Through		E	E	E	E	E	E
SB Right		A	A	A	A	A	A
Entire Intersection Delay (sec /veh)		23.0	30.7	23.6	31.7	23.6	31.8
Entire Intersection LOS		C	C	C	C	C	C
<u>83rd Avenue/W. 37th Street</u>	TWSC						
NB Approach		C	E	C	E	C	E
EB Left		A	A	A	A	A	A
WB Left		A	A	A	A	A	A
SB Approach		C	F	C	F	C	F
Critical Movement Delay (sec/veh)		18.9	52.2	19.6	62.6	19.6	62.6

Table 3
ESTIMATED TRAFFIC GENERATION ⁽¹⁾
PDC Denali Pad
Greeley, CO
LSC #220690; August, 2022

Trip Generating Phase	Estimated Begin Date ⁽³⁾	Estimated Duration ⁽³⁾	Vehicle-Trips Generated by Scenario ⁽¹⁾				
			Average Weekday	AM Peak-Hour ⁽²⁾		PM Peak-Hour ⁽²⁾	
				In	Out	In	Out
Phase:							
1 Construction 1	01-Jul-2023	20 days	84	7	6	6	7
2 Construction 2	21-Jul-2023	10 days	208	16	15	15	16
3 Drilling	31-Jul-2023	90 days	80	6	6	6	6
4 Completion	29-Oct-2023	90 days	42	3	3	3	3
5 Flowback	27-Jan-2024	60 days	66	5	5	5	5
6 Production/Operation	-	- days	2	0	0	0	0

Notes:

- (1) This information was provided by the Applicant
- (2) Conservatively assumes daily trips are evenly distributed over a 10 hour day with a 1.5 peaking factor - all volumes given in passenger car equivalents
- (3) The proposed timeline is subject to change based on field conditions.



TRANSPORTATION
CONSULTANTS, INC.

LSC

Figure 1

Vicinity Map

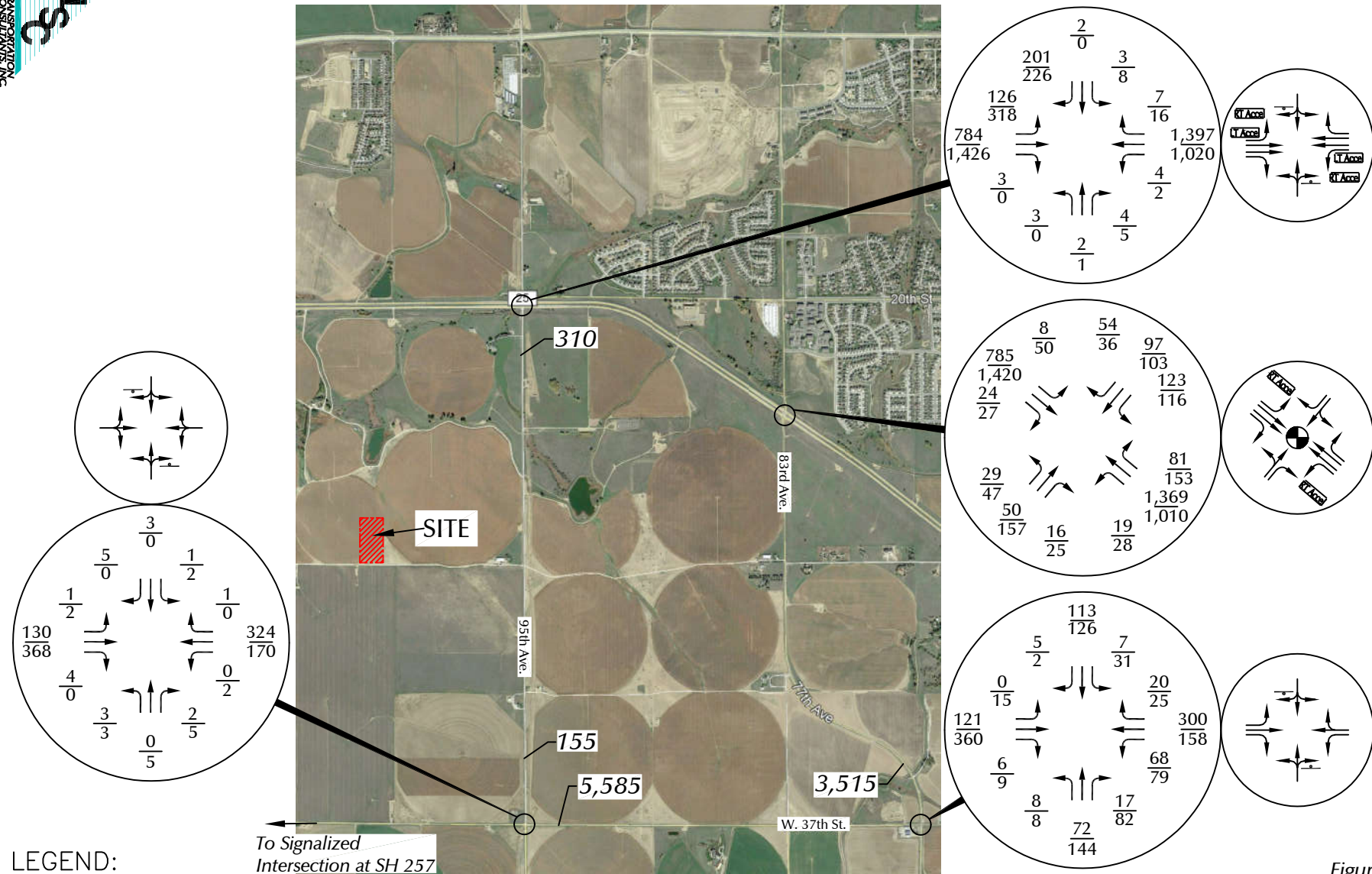
PDC - Denali (LSC #220690)



Approximate Scale
Scale: NTS

Figure 2
Site Plan

PDC - Denali (LSC #220690)



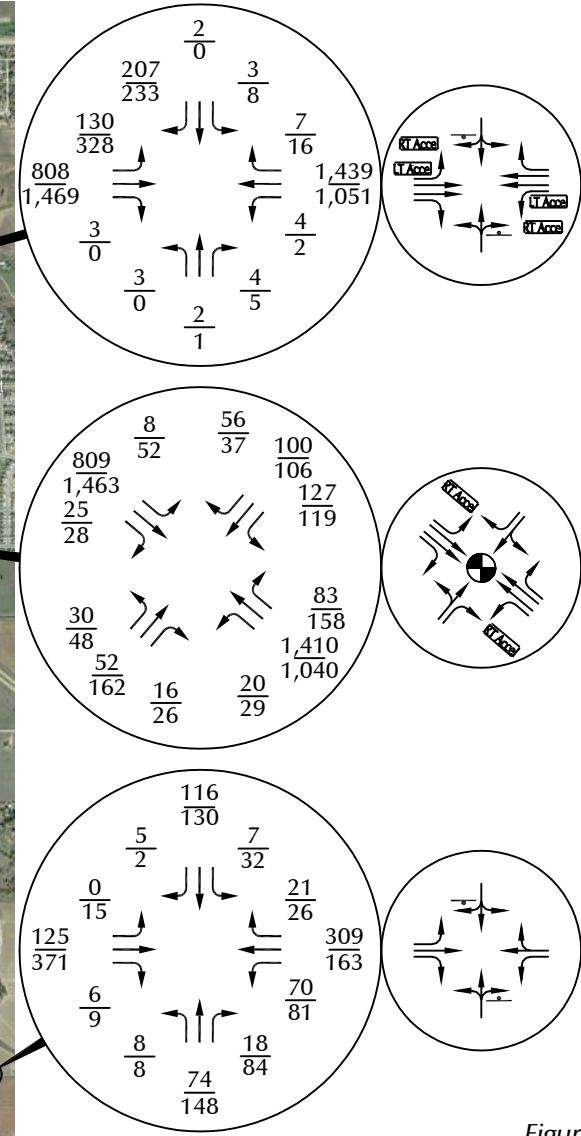
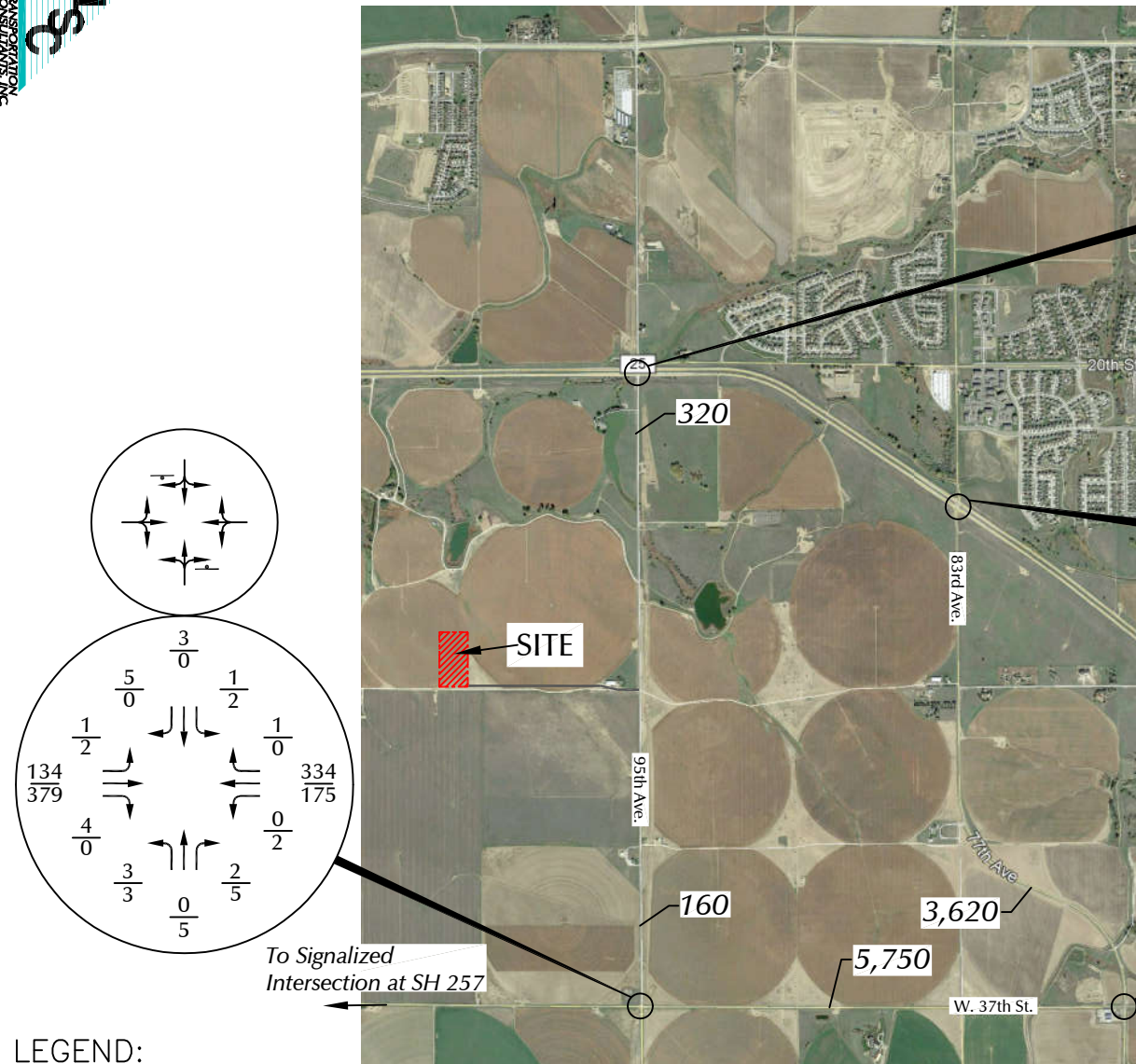
LEGEND:

- = Stop Sign
- = Traffic Signal
- $\frac{26}{35}$ = $\frac{\text{AM Peak Hour Traffic}}{\text{PM Peak Hour Traffic}}$
- 1,000 = Average Daily Traffic

Figure 3

Existing Traffic, Lane Geometry and Traffic Control

PDC - Denali (LSC #220690)



LEGEND:

- = Stop Sign
- = Traffic Signal
- $\frac{26}{35}$ = $\frac{\text{AM Peak Hour Traffic}}{\text{PM Peak Hour Traffic}}$
- 1,000 = Average Daily Traffic

Note: Assumes an annual growth rate of about 3 percent.

Year 2023 Background Traffic, Lane Geometry and Traffic Control

PDC - Denali (LSC #220690)

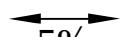
Figure 4



Approximate Scale
Scale: 1" = 3,000'



LEGEND:



5% = Percent Directional Distribution

Note: The recommended vehicle paths were chosen to avoid left-turns at nonsignalized highway intersections.

Directional Distribution of Site-Generated Traffic

PDC - Denali (LSC #220690)

Figure 5



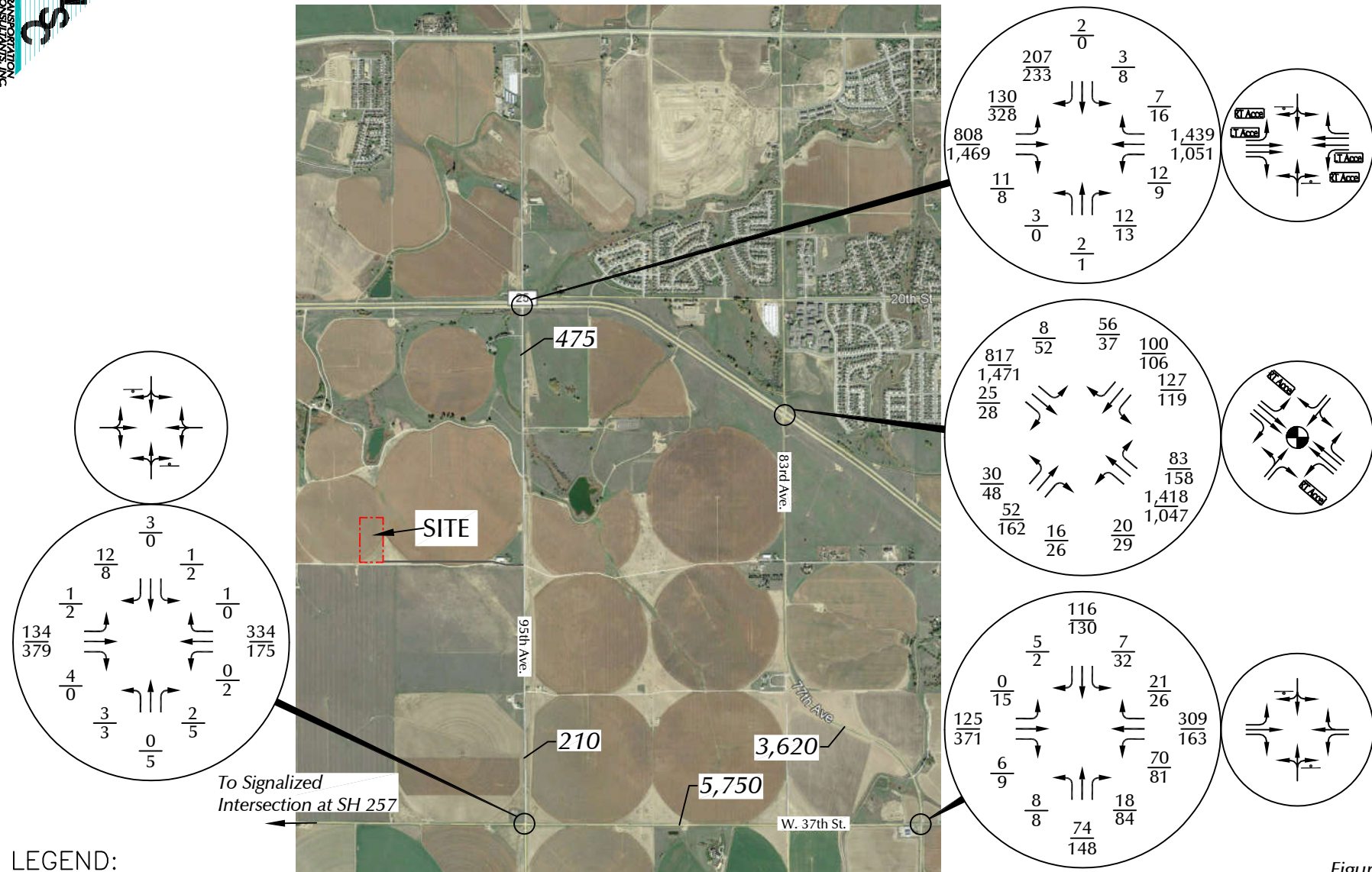
LEGEND:

$\frac{26}{35}$ = AM Peak Hour Traffic
 PM Peak Hour Traffic
 1,000 = Average Daily Traffic

Figure 6

Assignment of Site-Generated Traffic

PDC - Denali (LSC #220690)



LEGEND:

- = Stop Sign
- = Traffic Signal
- $\frac{26}{35}$ = $\frac{\text{AM Peak Hour Traffic}}{\text{PM Peak Hour Traffic}}$
- 1,000 = Average Daily Traffic

Figure 7

Year 2023 Total Traffic, Lane Geometry and Traffic Control

PDC - Denali (LSC #220690)

COUNTER MEASURES INC.

1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: 77TH AVE
E/W STREET: W. 37TH ST
CITY: GREELEY
COUNTY: WELD

File Name : 77THW37
Site Code : 00000008
Start Date : 7/14/2022
Page No : 1

Groups Printed- VEHICLES

	77TH AVE Southbound				W. 37TH ST Westbound				77TH AVE Northbound				W. 37TH ST Eastbound				Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	4	20	0	0	22	81	8	0	2	16	4	0	0	27	3	0	187
06:45 AM	1	35	3	0	19	78	7	0	2	21	5	0	0	30	1	0	202
Total	5	55	3	0	41	159	15	0	4	37	9	0	0	57	4	0	389
07:00 AM	0	31	1	0	14	66	3	0	1	16	1	0	0	27	2	0	162
07:15 AM	2	27	1	0	13	75	2	0	3	19	7	0	0	37	0	0	186
07:30 AM	1	28	1	0	21	80	9	0	2	18	16	0	2	39	3	0	220
07:45 AM	3	28	6	0	19	50	5	0	2	23	7	0	2	23	0	0	168
Total	6	114	9	0	67	271	19	0	8	76	31	0	4	126	5	0	736
08:00 AM	1	17	1	0	6	63	0	0	1	21	6	0	2	35	3	0	156
08:15 AM	3	15	4	0	11	45	2	0	2	20	7	0	0	33	0	0	142
Total	4	32	5	0	17	108	2	0	3	41	13	0	2	68	3	0	298
04:00 PM	3	40	2	0	19	41	8	0	1	38	23	0	3	70	5	0	253
04:15 PM	3	29	0	0	18	49	5	0	1	41	24	0	9	68	1	0	248
04:30 PM	6	21	1	0	14	51	5	0	2	36	13	0	2	67	2	0	220
04:45 PM	5	23	2	0	19	46	6	0	2	30	19	0	2	99	0	0	253
Total	17	113	5	0	70	187	24	0	6	145	79	0	16	304	8	0	974
05:00 PM	10	35	0	0	19	49	8	0	1	35	22	0	7	76	1	0	263
05:15 PM	6	43	0	0	24	38	5	0	3	37	9	0	4	94	1	0	264
05:30 PM	9	23	2	0	22	44	8	0	0	36	28	0	1	107	4	0	284
05:45 PM	6	25	0	0	14	27	4	0	4	36	23	0	3	83	3	0	228
Total	31	126	2	0	79	158	25	0	8	144	82	0	15	360	9	0	1039
Grand Total	63	440	24	0	274	883	85	0	29	443	214	0	37	915	29	0	3436
Apprch %	12.0	83.5	4.6	0.0	22.1	71.1	6.8	0.0	4.2	64.6	31.2	0.0	3.8	93.3	3.0	0.0	
Total %	1.8	12.8	0.7	0.0	8.0	25.7	2.5	0.0	0.8	12.9	6.2	0.0	1.1	26.6	0.8	0.0	

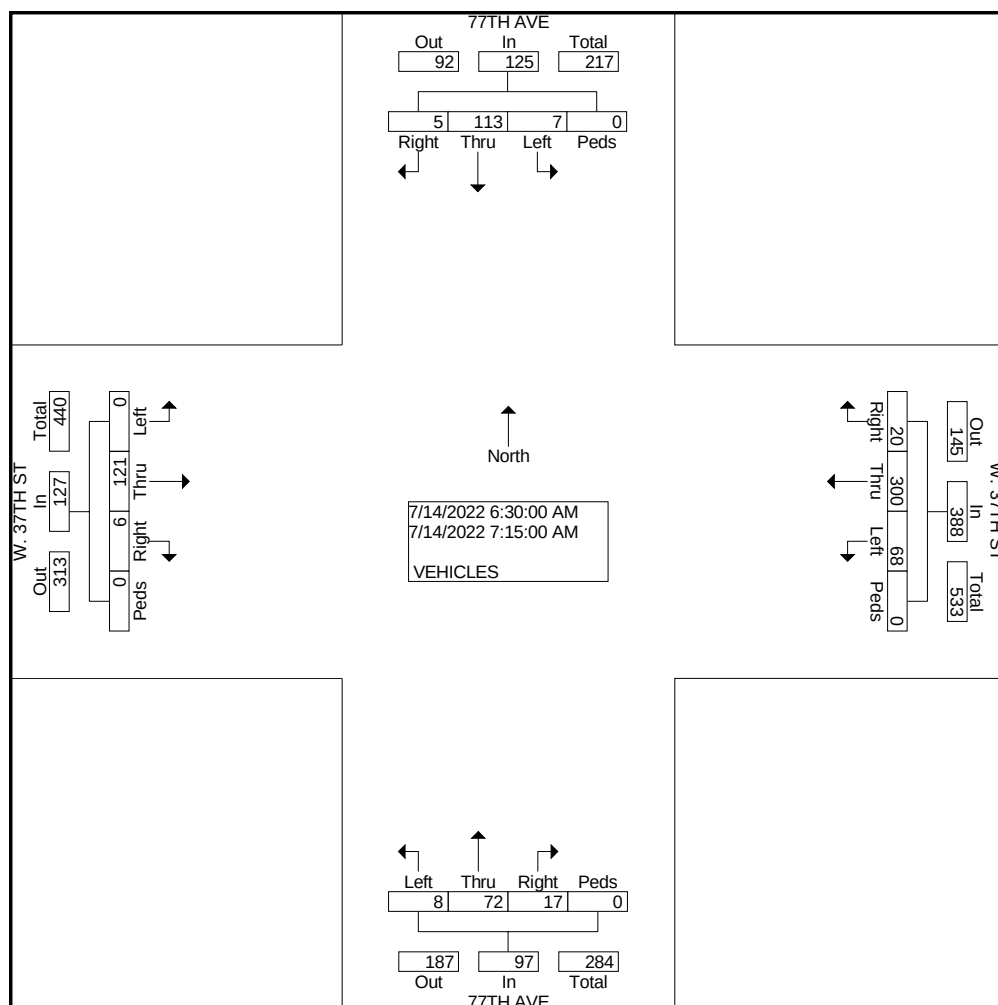
COUNTER MEASURES INC.

1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: 77TH AVE
E/W STREET: W. 37TH ST
CITY: GREELEY
COUNTY: WELD

File Name : 77THW37
Site Code : 00000008
Start Date : 7/14/2022
Page No : 2

	77TH AVE Southbound					W. 37TH ST Westbound					77TH AVE Northbound					W. 37TH ST Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 AM to 07:15 AM - Peak 1 of 1	06:30 AM																				
Intersection	06:30 AM																				
Volume	7	113	5	0	125	68	300	20	0	388	8	72	17	0	97	0	121	6	0	127	737
Percent	5.6	90.4	4.0	0.0		17.5	77.3	5.2	0.0		8.2	74.2	17.5	0.0		0.0	95.3	4.7	0.0		
06:45 Volume	1	35	3	0	39	19	78	7	0	104	2	21	5	0	28	0	30	1	0	31	202
Peak Factor																					0.912
High Int. Volume	06:45 AM					06:30 AM					07:15 AM					07:15 AM					
Peak Factor	1	35	3	0	39	22	81	8	0	111	3	19	7	0	29	0	37	0	0	37	
	0.80					0.87					0.83					0.85					8
	1					4					6										



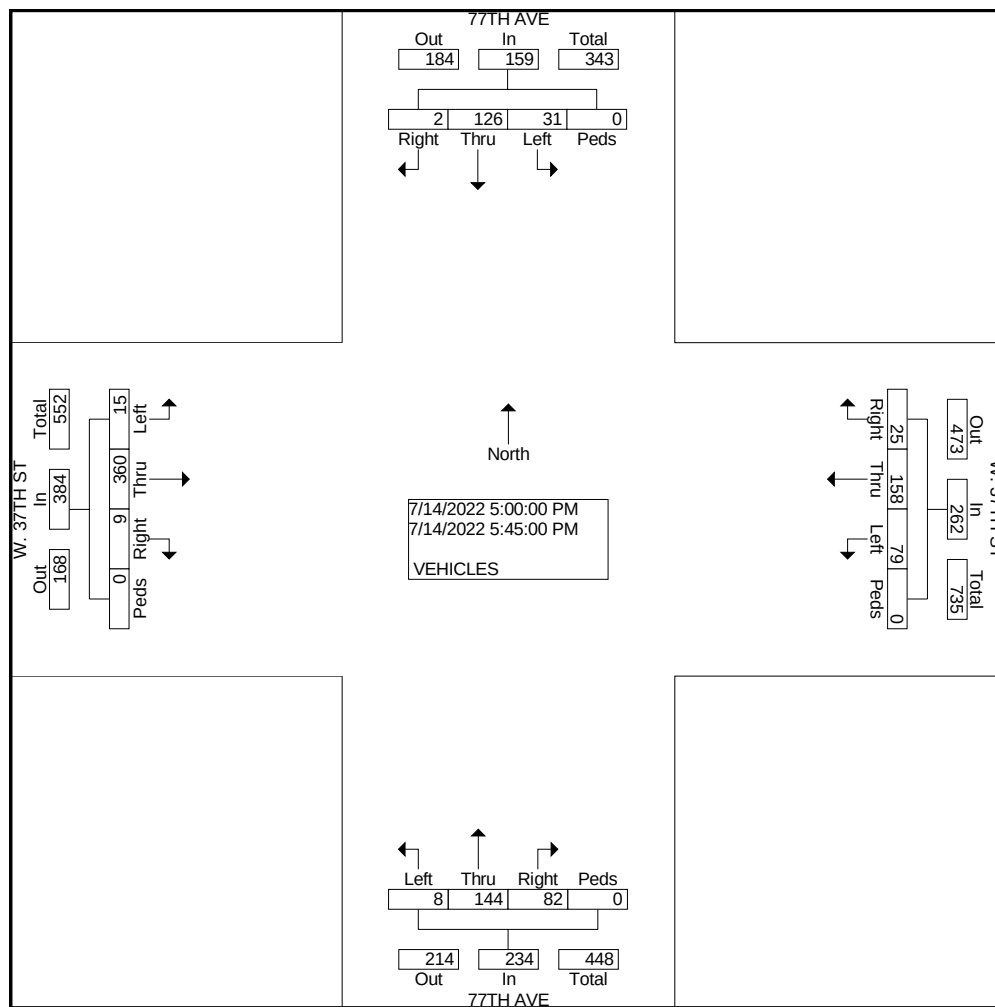
COUNTER MEASURES INC.

1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: 77TH AVE
E/W STREET: W. 37TH ST
CITY: GREELEY
COUNTY: WELD

File Name : 77THW37
Site Code : 00000008
Start Date : 7/14/2022
Page No : 3

	77TH AVE Southbound					W. 37TH ST Westbound					77TH AVE Northbound					W. 37TH ST Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 05:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection	05:00 PM																				
Volume	31	126	2	0	159	79	158	25	0	262	8	144	82	0	234	15	360	9	0	384	1039
Percent	19.5	79.2	1.3	0.0		30.2	60.3	9.5	0.0		3.4	61.5	35.0	0.0		3.9	93.8	2.3	0.0		
05:30 Volume	9	23	2	0	34	22	44	8	0	74	0	36	28	0	64	1	107	4	0	112	284
Peak Factor	0.915																				
High Int. Volume	05:15 PM					05:00 PM					05:30 PM					05:30 PM					
Peak Factor	6	43	0	0	49	19	49	8	0	76	0	36	28	0	64	1	107	4	0	112	
	0.81					0.86					0.91					0.85					
	1					2					4					7					



COUNTER MEASURES INC.

1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: 83RD AVE
E/W STREET: HWY 34
CITY: GREELEY
COUNTY: WELD

File Name : 83RDHWY3422
Site Code : 00000017
Start Date : 7/12/2022
Page No : 1

Groups Printed- VEHICLES

	83RD AVE Southbound				HWY 34 Westbound				83RD AVE Northbound				HWY 34 Eastbound				Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	31	34	17	1	4	384	25	1	12	10	5	0	1	170	7	0	702
06:45 AM	36	19	9	0	9	339	16	0	10	17	4	0	3	183	3	0	648
Total	67	53	26	1	13	723	41	1	22	27	9	0	4	353	10	0	1350
07:00 AM	28	22	12	0	4	301	24	0	4	13	6	0	1	194	8	0	617
07:15 AM	28	22	16	0	2	345	16	0	3	10	1	0	3	238	6	0	690
07:30 AM	39	16	8	0	4	323	17	0	13	24	4	0	7	204	1	0	660
07:45 AM	32	9	10	0	6	291	21	0	13	24	2	0	1	266	8	0	683
Total	127	69	46	0	16	1260	78	0	33	71	13	0	12	902	23	0	2650
08:00 AM	28	17	11	0	1	260	17	0	7	18	0	0	2	210	4	0	575
08:15 AM	20	17	14	0	2	254	21	0	7	17	1	0	6	193	1	0	553
Total	48	34	25	0	3	514	38	0	14	35	1	0	8	403	5	0	1128
04:00 PM	24	15	2	0	5	276	26	0	7	36	0	0	5	305	9	0	710
04:15 PM	29	24	6	0	7	229	32	0	11	39	0	0	18	288	14	0	697
04:30 PM	29	26	6	0	4	270	35	0	9	39	4	0	6	346	10	0	784
04:45 PM	49	20	7	0	8	220	32	0	6	31	4	0	8	337	6	0	728
Total	131	85	21	0	24	995	125	0	33	145	8	0	37	1276	39	0	2919
05:00 PM	23	29	8	0	11	268	39	0	12	57	9	0	13	333	12	0	814
05:15 PM	34	30	7	0	9	274	45	0	14	39	6	0	9	360	3	0	830
05:30 PM	29	20	13	0	7	214	33	0	9	40	7	0	17	367	2	0	758
05:45 PM	30	24	8	0	1	254	36	0	12	21	3	0	11	360	10	0	770
Total	116	103	36	0	28	1010	153	0	47	157	25	0	50	1420	27	0	3172
Grand Total	489	344	154	1	84	4502	435	1	149	435	56	0	111	4354	104	0	11219
Apprch %	49.5	34.8	15.6	0.1	1.7	89.6	8.7	0.0	23.3	68.0	8.8	0.0	2.4	95.3	2.3	0.0	
Total %	4.4	3.1	1.4	0.0	0.7	40.1	3.9	0.0	1.3	3.9	0.5	0.0	1.0	38.8	0.9	0.0	

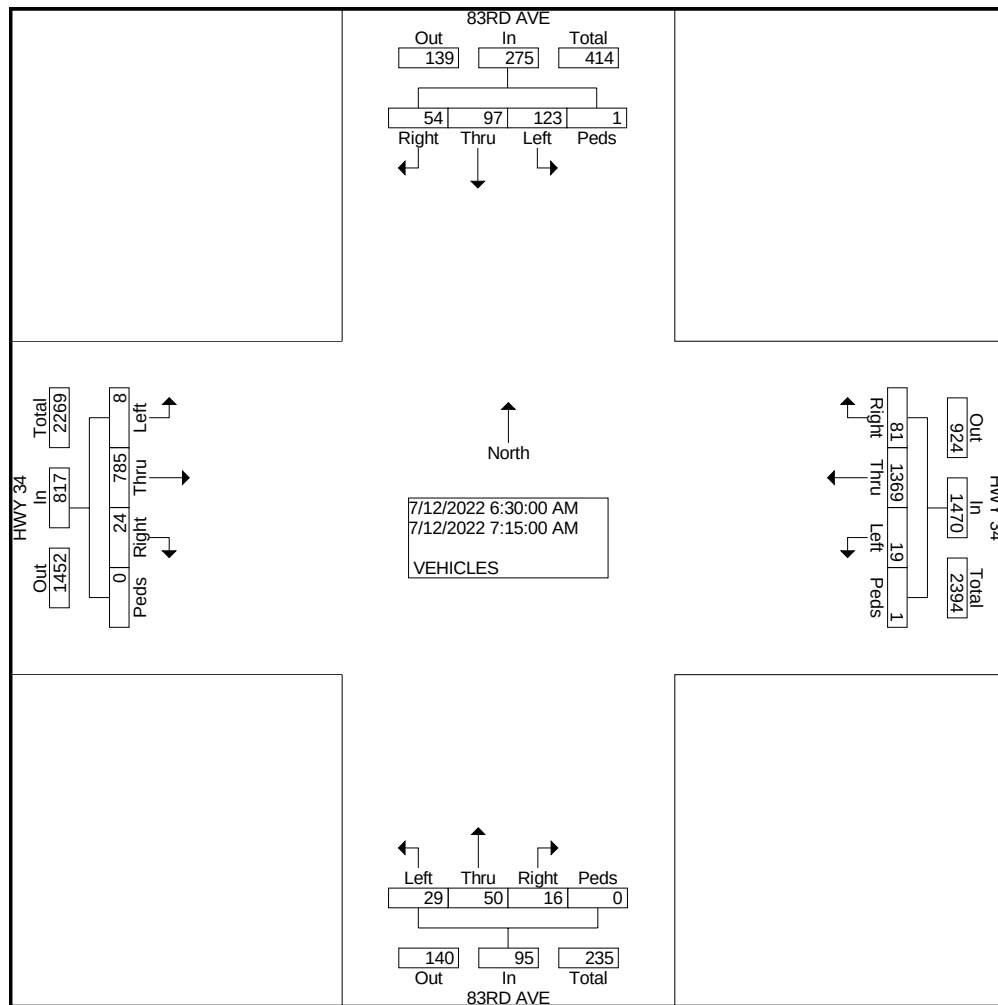
COUNTER MEASURES INC.

1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: 83RD AVE
E/W STREET: HWY 34
CITY: GREELEY
COUNTY: WELD

File Name : 83RDHWY3422
Site Code : 00000017
Start Date : 7/12/2022
Page No : 2

	83RD AVE Southbound					HWY 34 Westbound					83RD AVE Northbound					HWY 34 Eastbound					Int. Total
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 AM to 08:15 AM - Peak 1 of 1	06:30 AM																				
Volume	123	97	54	1	275	19	1369	81	1	1470	29	50	16	0	95	8	785	24	0	817	2657
Percent	44.7	35.3	19.6	0.4		1.3	93.1	5.5	0.1		30.5	52.6	16.8	0.0		1.0	96.1	2.9	0.0		
06:30 Volume	31	34	17	1	83	4	384	25	1	414	12	10	5	0	27	1	170	7	0	178	702
Peak Factor																					0.946
High Int. Volume	31	34	17	1	83	4	384	25	1	414	10	17	4	0	31	3	238	6	0	247	
Peak Factor																					0.827



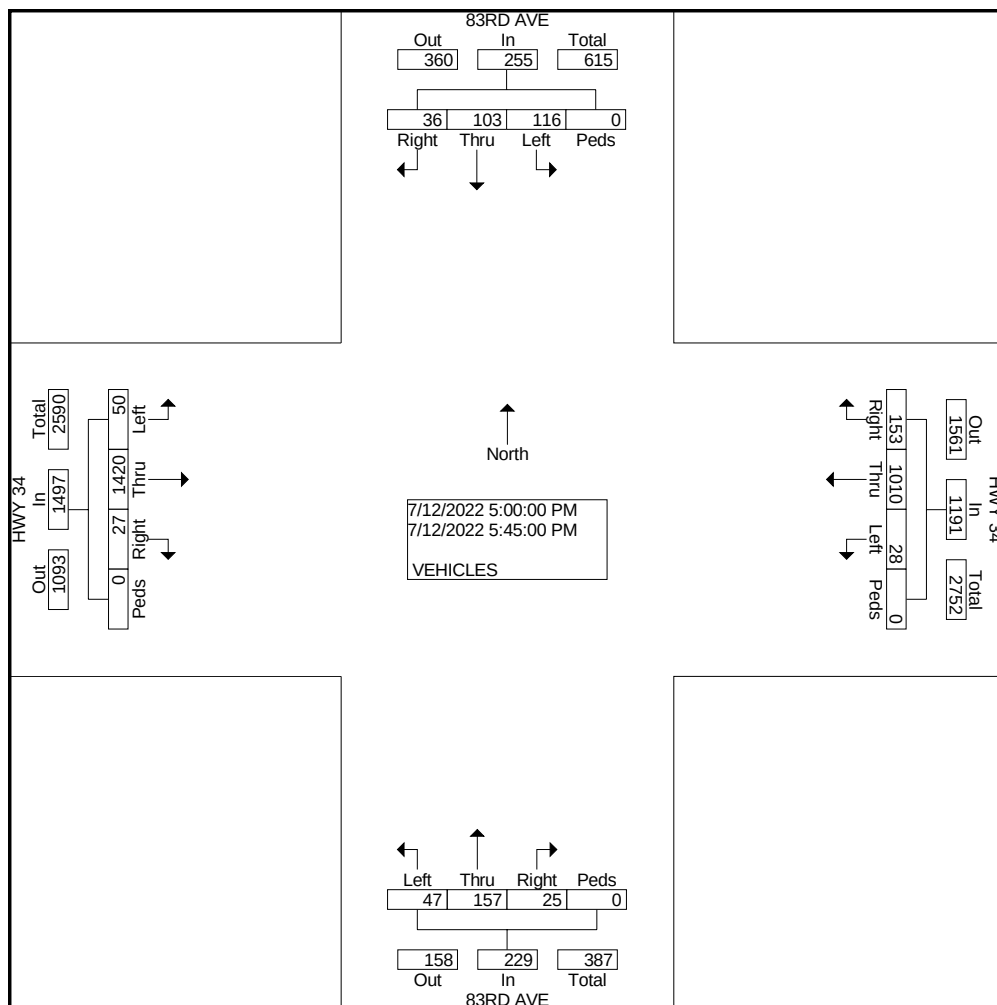
COUNTER MEASURES INC.

1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: 83RD AVE
E/W STREET: HWY 34
CITY: GREELEY
COUNTY: WELD

File Name : 83RDHWY3422
Site Code : 00000017
Start Date : 7/12/2022
Page No : 3

	83RD AVE Southbound					HWY 34 Westbound					83RD AVE Northbound					HWY 34 Eastbound					Int. Total
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection	05:00 PM																				
Volume	116	103	36	0	255	28	101	153	0	1191	47	157	25	0	229	50	142	27	0	1497	3172
Percent	45.5	40.4	14.1	0.0		2.4	84.8	12.8	0.0		20.5	68.6	10.9	0.0		3.3	94.9	1.8	0.0		
05:15 Volume	34	30	7	0	71	9	274	45	0	328	14	39	6	0	59	9	360	3	0	372	830
Peak Factor	0.955																				
High Int.																					
Volume	05:15 PM					05:15 PM					05:00 PM					05:30 PM					
Peak Factor	34	30	7	0	71	9	274	45	0	328	12	57	9	0	78	17	367	2	0	386	
	0.89					0.90					0.73					0.97					
	8					8					4					0					



COUNTER MEASURES INC.

1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: 95TH AVE
E/W STREET: HWY 34
CITY: GREELEY
COUNTY: WELD

File Name : 95THHWY3422
Site Code : 00000013
Start Date : 7/13/2022
Page No : 1

Groups Printed- VEHICLES

	95TH AVE Southbound				HWY 34 Westbound				95TH AVE Northbound				HWY 34 Eastbound				Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	2	0	50	1	2	428	4	0	0	1	1	0	26	172	0	0	687
06:45 AM	0	0	37	0	0	369	0	0	1	0	0	0	18	195	2	0	622
Total	2	0	87	1	2	797	4	0	1	1	1	0	44	367	2	0	1309
07:00 AM	0	0	44	0	1	291	0	0	0	1	0	0	32	211	1	0	581
07:15 AM	1	2	70	0	1	309	3	0	2	0	3	0	50	206	0	0	647
07:30 AM	1	2	47	3	3	264	3	0	3	1	0	0	62	182	0	0	571
07:45 AM	0	0	52	0	0	299	5	0	0	0	0	0	75	277	0	0	708
Total	2	4	213	3	5	1163	11	0	5	2	3	0	219	876	1	0	2507
08:00 AM	2	1	44	0	1	258	0	0	0	1	1	0	43	210	0	0	561
08:15 AM	0	2	48	0	1	279	3	0	0	0	2	0	27	195	2	0	559
Total	2	3	92	0	2	537	3	0	0	1	3	0	70	405	2	0	1120
04:00 PM	3	0	51	0	0	249	4	0	1	0	2	0	60	301	0	0	671
04:15 PM	3	1	75	0	1	257	1	0	0	1	1	0	75	322	0	0	737
04:30 PM	1	0	78	0	1	252	6	0	0	1	2	0	76	321	0	0	738
04:45 PM	1	1	58	0	0	226	1	0	0	1	1	0	70	346	0	0	705
Total	8	2	262	0	2	984	12	0	1	3	6	0	281	1290	0	0	2851
05:00 PM	4	0	63	0	1	260	2	0	0	0	0	0	85	337	0	0	752
05:15 PM	0	0	52	0	0	279	5	0	0	0	4	0	88	366	0	0	794
05:30 PM	2	0	60	0	0	215	4	0	0	1	0	0	78	378	0	0	738
05:45 PM	2	0	51	0	1	266	5	0	0	0	1	0	67	345	0	0	738
Total	8	0	226	0	2	1020	16	0	0	1	5	0	318	1426	0	0	3022
Grand Total	22	9	880	4	13	4501	46	0	7	8	18	0	932	4364	5	0	10809
Apprch %	2.4	1.0	96.2	0.4	0.3	98.7	1.0	0.0	21.2	24.2	54.5	0.0	17.6	82.3	0.1	0.0	
Total %	0.2	0.1	8.1	0.0	0.1	41.6	0.4	0.0	0.1	0.1	0.2	0.0	8.6	40.4	0.0	0.0	

COUNTER MEASURES INC.

1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: 95TH AVE
E/W STREET: HWY 34
CITY: GREELEY
COUNTY: WELD

File Name : 95THHWY3422
Site Code : 00000013
Start Date : 7/13/2022
Page No : 2

	95TH AVE Southbound					HWY 34 Westbound					95TH AVE Northbound					HWY 34 Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 AM to 07:15 AM - Peak 1 of 1																					
Intersection	06:30 AM																				
Volume	3	2	201	1	207	4	139	7	0	1408	3	2	4	0	9	126	784	3	0	913	2537
Percent	1.4	1.0	97.1	0.5		0.3	99.2	0.5	0.0		33.3	22.2	44.4	0.0		13.8	85.9	0.3	0.0		
06:30 Volume	2	0	50	1	53	2	428	4	0	434	0	1	1	0	2	26	172	0	0	198	687
Peak Factor																					0.923
High Int.	07:15 AM					06:30 AM					07:15 AM					07:15 AM					
Volume	1	2	70	0	73	2	428	4	0	434	2	0	3	0	5	50	206	0	0	256	
Peak Factor																					
						</															

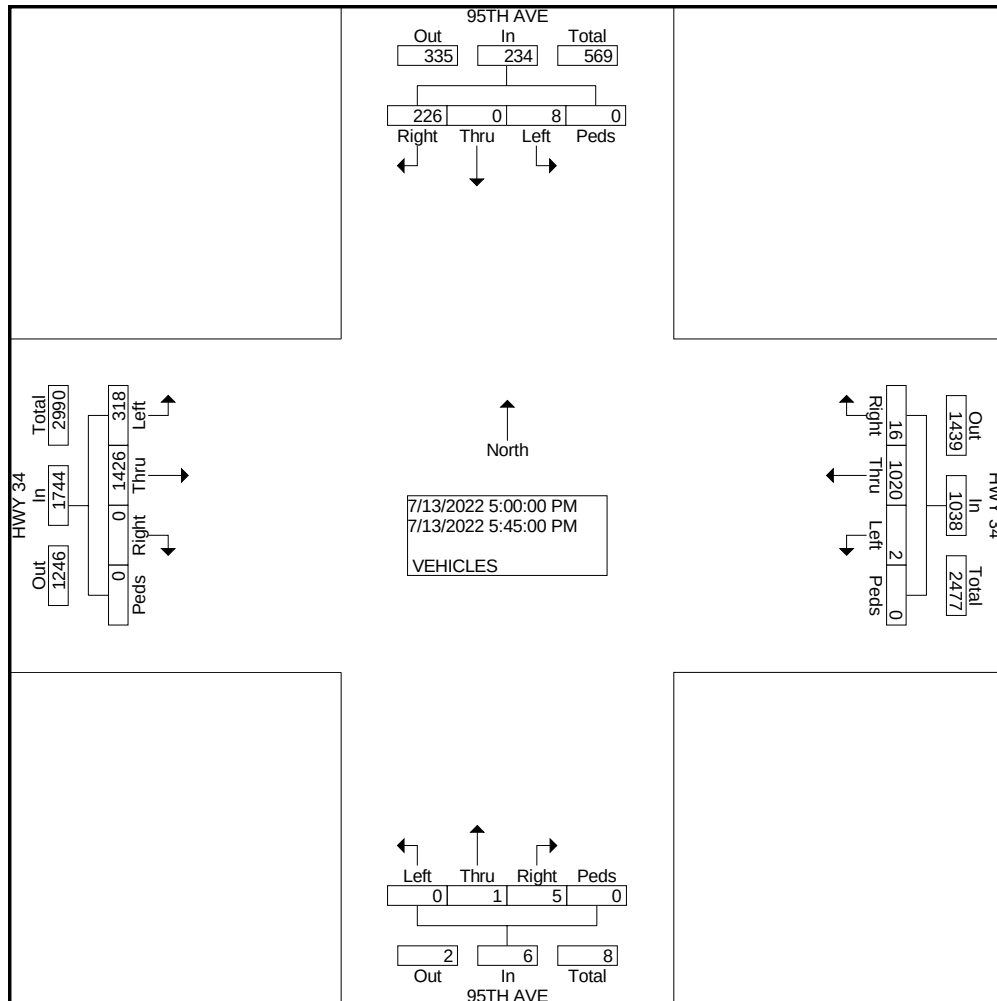
COUNTER MEASURES INC.

1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: 95TH AVE
E/W STREET: HWY 34
CITY: GREELEY
COUNTY: WELD

File Name : 95THHWY3422
Site Code : 00000013
Start Date : 7/13/2022
Page No : 3

	95TH AVE Southbound					HWY 34 Westbound					95TH AVE Northbound					HWY 34 Eastbound					Int. Total
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 05:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection 05:00 PM																					
Volume	8	0	226	0	234	2	102	16	0	1038	0	1	5	0	6	318	142	0	0	1744	3022
Percent	3.4	0.0	96.6	0.0		0.2	98.3	1.5	0.0		0.0	16.7	83.3	0.0		18.2	81.8	0.0	0.0		
05:15 Volume	0	0	52	0	52	0	279	5	0	284	0	0	4	0	4	88	366	0	0	454	794
Peak Factor																					0.952
High Int. Volume	05:00 PM					05:15 PM					05:15 PM					05:30 PM					
Peak Factor	4	0	63	0	67	0	279	5	0	284	0	0	4	0	4	78	378	0	0	456	
					0.87					0.91					0.37					0.95	
					3					4					5					6	



COUNTER MEASURES INC.

1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: 95TH AVE
E/W STREET: W. 37TH ST
CITY: GREELEY
COUNTY: WELD

File Name : 95THW37TH
Site Code : 00000011
Start Date : 7/14/2022
Page No : 1

Groups Printed- VEHICLES

	95TH AVE Southbound				W. 37TH ST Westbound				95TH AVE Northbound				W. 37TH ST Eastbound				Int. Total
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	0	0	1	0	0	81	1	0	1	0	0	0	1	32	1	0	118
06:45 AM	1	0	0	0	0	86	0	0	2	0	0	0	0	30	0	0	119
Total	1	0	1	0	0	167	1	0	3	0	0	0	1	62	1	0	237
07:00 AM	0	1	2	0	0	77	0	0	0	0	0	0	0	30	2	0	112
07:15 AM	0	2	2	0	0	80	0	0	0	0	2	0	0	38	1	0	125
07:30 AM	0	2	0	0	1	78	1	0	0	0	0	0	2	45	2	0	131
07:45 AM	0	0	2	0	0	65	0	0	1	1	0	0	0	26	0	0	95
Total	0	5	6	0	1	300	1	0	1	1	2	0	2	139	5	0	463
08:00 AM	1	1	2	0	1	56	0	0	0	0	1	0	0	36	0	0	98
08:15 AM	0	0	0	0	1	48	2	0	1	0	1	0	0	34	0	0	87
Total	1	1	2	0	2	104	2	0	1	0	2	0	0	70	0	0	185
04:00 PM	0	0	0	0	0	57	0	0	1	0	0	0	0	112	0	0	170
04:15 PM	0	0	0	0	0	95	1	0	0	1	0	0	0	142	0	0	239
04:30 PM	0	0	0	0	1	52	0	0	0	2	1	0	0	70	0	0	126
04:45 PM	0	0	0	0	1	43	0	0	0	3	2	0	0	93	0	0	142
Total	0	0	0	0	2	247	1	0	1	6	3	0	0	417	0	0	677
05:00 PM	1	0	0	0	1	48	0	0	0	2	2	0	1	77	0	0	132
05:15 PM	0	0	0	0	1	44	0	0	0	0	0	0	0	102	0	0	147
05:30 PM	0	0	0	0	0	36	0	0	2	2	1	0	1	106	0	0	148
05:45 PM	1	0	0	0	0	42	0	0	1	1	2	0	0	83	0	0	130
Total	2	0	0	0	2	170	0	0	3	5	5	0	2	368	0	0	557
Grand Total	4	6	9	0	7	988	5	0	9	12	12	0	5	1056	6	0	2119
Apprch %	21.1	31.6	47.4	0.0	0.7	98.8	0.5	0.0	27.3	36.4	36.4	0.0	0.5	99.0	0.6	0.0	
Total %	0.2	0.3	0.4	0.0	0.3	46.6	0.2	0.0	0.4	0.6	0.6	0.0	0.2	49.8	0.3	0.0	

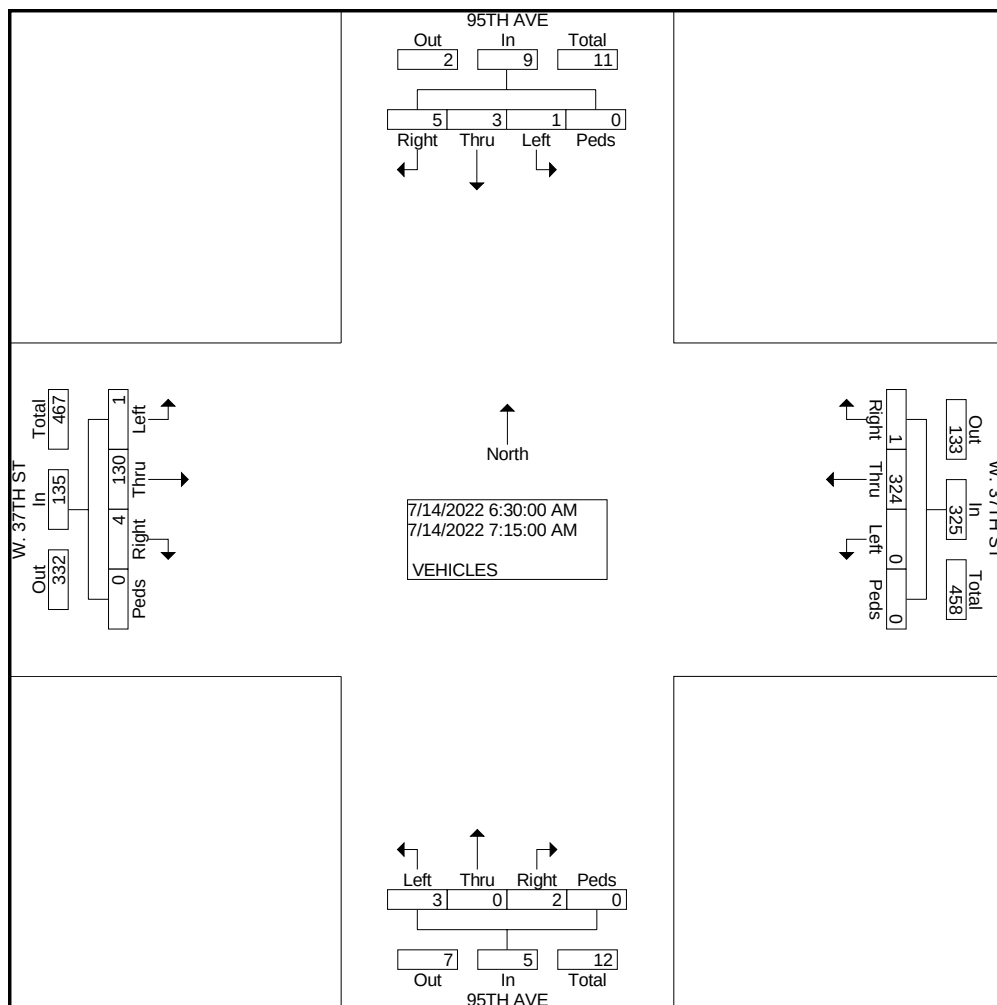
COUNTER MEASURES INC.

1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: 95TH AVE
E/W STREET: W. 37TH ST
CITY: GREELEY
COUNTY: WELD

File Name : 95THW37TH
Site Code : 00000011
Start Date : 7/14/2022
Page No : 2

	95TH AVE Southbound					W. 37TH ST Westbound					95TH AVE Northbound					W. 37TH ST Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 06:30 AM to 07:15 AM - Peak 1 of 1	06:30 AM																				
Intersection	06:30 AM																				
Volume	1	3	5	0	9	0	324	1	0	325	3	0	2	0	5	1	130	4	0	135	474
Percent	11.1	33.3	55.6	0.0		0.0	99.7	0.3	0.0		60.0	0.0	40.0	0.0		0.7	96.3	3.0	0.0		
07:15																					
Volume	0	2	2	0	4	0	80	0	0	80	0	0	2	0	2	0	38	1	0	39	125
Peak Factor																					0.948
High Int.	07:15 AM					06:45 AM					06:45 AM					07:15 AM					
Volume	0	2	2	0	4	0	86	0	0	86	2	0	0	0	2	0	38	1	0	39	
Peak Factor	0.56					0.94					0.62					0.86					
	3					5					5					5					



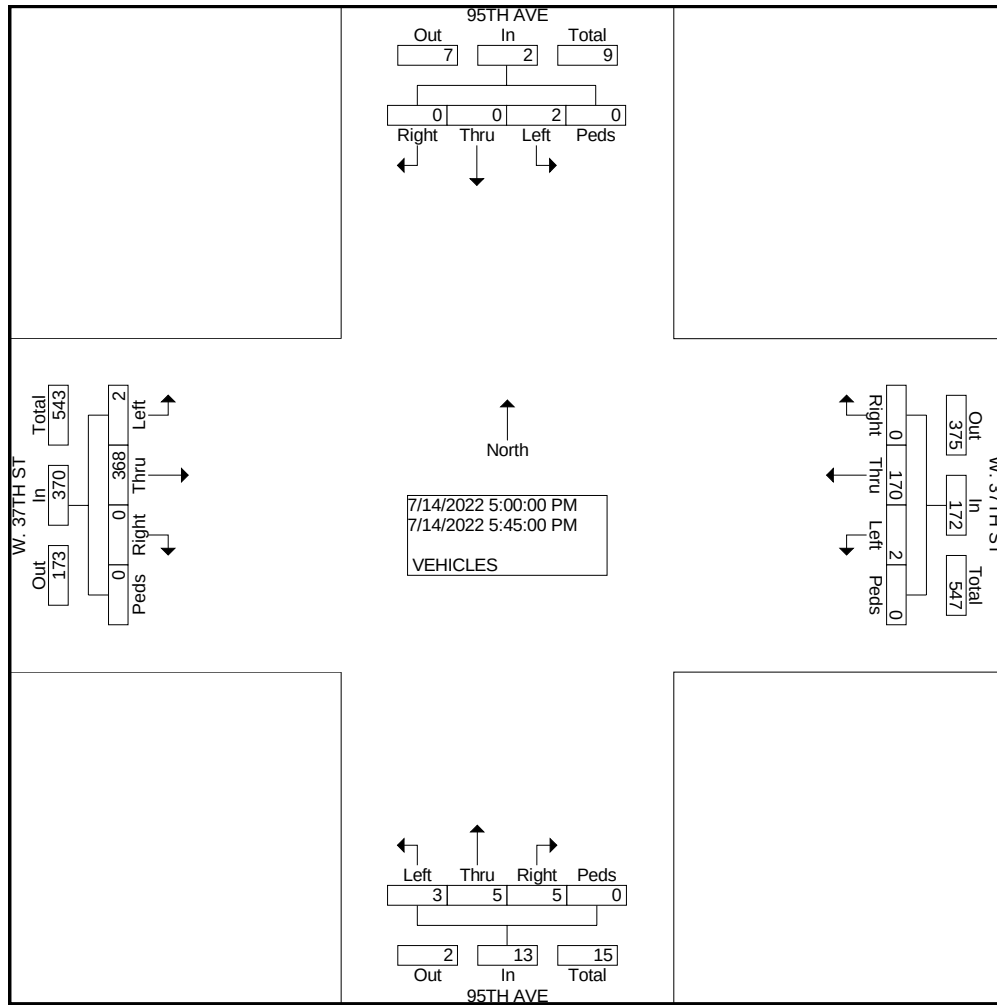
COUNTER MEASURES INC.

1889 YORK STREET
DENVER.COLORADO
303-333-7409

N/S STREET: 95TH AVE
E/W STREET: W. 37TH ST
CITY: GREELEY
COUNTY: WELD

File Name : 95THW37TH
Site Code : 00000011
Start Date : 7/14/2022
Page No : 3

	95TH AVE Southbound					W. 37TH ST Westbound					95TH AVE Northbound					W. 37TH ST Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour From 05:00 PM to 05:45 PM - Peak 1 of 1																					
Intersection	05:00 PM																				
Volume	2	0	0	0	2	2	170	0	0	172	3	5	5	0	13	2	368	0	0	370	557
Percent	100.0	0.0	0.0	0.0		1.2	98.8	0.0	0.0		23.1	38.5	38.5	0.0		0.5	99.5	0.0	0.0		
05:30 Volume	0	0	0	0	0	0	36	0	0	36	2	2	1	0	5	1	106	0	0	107	148
Peak Factor	0.941																				
High Int. Volume	05:00 PM					05:00 PM					05:30 PM					05:30 PM					
Peak Factor	1	0	0	0	1	1	48	0	0	49	2	2	1	0	5	1	106	0	0	107	
	0.50					0.87					0.65					0.86					
	0					8					0					4					



Site Code: 221203
Station ID: 221203

Start Time	13-Jul-22	NORTH	SOUTH								Total
12:00 AM		16	15								31
01:00		9	17								26
02:00		9	20								29
03:00		11	11								22
04:00		22	45								67
05:00		42	111								153
06:00		100	154								254
07:00		129	118								247
08:00		91	94								185
09:00		67	58								125
10:00		83	78								161
11:00		57	76								133
12:00 PM		66	78								144
01:00		75	78								153
02:00		91	88								179
03:00		145	137								282
04:00		181	138								319
05:00		204	174								378
06:00		142	79								221
07:00		75	51								126
08:00		61	44								105
09:00		45	41								86
10:00		23	26								49
11:00		20	22								42
Total		1764	1753								3517
Percent		50.2%	49.8%								
AM Peak	-	07:00	06:00	-	-	-	-	-	-	06:00	
Vol.	-	129	154	-	-	-	-	-	-	254	
PM Peak	-	17:00	17:00	-	-	-	-	-	-	17:00	
Vol.	-	204	174	-	-	-	-	-	-	378	
Grand Total		1764	1753								3517
Percent		50.2%	49.8%								
ADT		ADT 3,479	AADT 3,479								

Location: 95TH AVE N-O W. 37TH ST
City: GREELEY
County: WELD
Direction: NORTH/SOUTH

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Site Code: 221200
Station ID: 221200

Start Time	13-Jul-22 Wed	NORTH	SOUTH							Total
12:00 AM		1	1							2
01:00		0	0							0
02:00		0	0							0
03:00		0	2							2
04:00		0	1							1
05:00		1	6							7
06:00		6	4							10
07:00		3	12							15
08:00		3	4							7
09:00		7	10							17
10:00		3	5							8
11:00		1	5							6
12:00 PM		7	6							13
01:00		3	9							12
02:00		4	9							13
03:00		3	3							6
04:00		7	2							9
05:00		7	2							9
06:00		3	3							6
07:00		3	1							4
08:00		2	1							3
09:00		1	2							3
10:00		0	0							0
11:00		1	1							2
Total		66	89							155
Percent		42.6%	57.4%							
AM Peak	-	09:00	07:00	-	-	-	-	-	-	09:00
Vol.	-	7	12	-	-	-	-	-	-	17
PM Peak	-	12:00	13:00	-	-	-	-	-	-	12:00
Vol.	-	7	9	-	-	-	-	-	-	13
Grand Total		66	89							155
Percent		42.6%	57.4%							
ADT		ADT 149	AADT 149							

Site Code: 221215
Station ID: 221215

Start Time	13-Jul-22	NORTH	SOUTH								Total
12:00 AM		1	0								1
01:00		0	1								1
02:00		0	0								0
03:00		0	3								3
04:00		1	2								3
05:00		12	6								18
06:00		13	13								26
07:00		14	12								26
08:00		14	7								21
09:00		17	12								29
10:00		10	7								17
11:00		4	7								11
12:00 PM		21	11								32
01:00		14	10								24
02:00		9	7								16
03:00		5	10								15
04:00		13	1								14
05:00		7	2								9
06:00		18	4								22
07:00		9	1								10
08:00		4	0								4
09:00		3	3								6
10:00		0	0								0
11:00		2	0								2
Total		191	119								310
Percent		61.6%	38.4%								
AM Peak	-	09:00	06:00	-	-	-	-	-	-	09:00	
Vol.	-	17	13	-	-	-	-	-	-	29	
PM Peak	-	12:00	12:00	-	-	-	-	-	-	12:00	
Vol.	-	21	11	-	-	-	-	-	-	32	
Grand Total		191	119								310
Percent		61.6%	38.4%								
ADT		ADT 321	AADT 321								

Location: W. 37TH ST E-O 95TH AVE
City: GREELEY
County: WELD
Direction: EAST/WEST

COUNTER MEASURES INC.
1889 YORK STREET
DENVER,COLORADO 80206
303-333-7409

Site Code: 221214
Station ID: 221214

Start Time	13-Jul-22 Wed	EAST	WEST							Total
12:00 AM		10	8							18
01:00		12	3							15
02:00		6	5							11
03:00		6	10							16
04:00		5	37							42
05:00		41	141							182
06:00		111	327							438
07:00		142	290							432
08:00		126	186							312
09:00		100	146							246
10:00		112	150							262
11:00		138	133							271
12:00 PM		138	135							273
01:00		144	128							272
02:00		177	125							302
03:00		226	182							408
04:00		341	210							551
05:00		365	210							575
06:00		277	123							400
07:00		130	94							224
08:00		80	56							136
09:00		41	41							82
10:00		39	20							59
11:00		35	22							57
Total		2802	2782							5584
Percent		50.2%	49.8%							
AM Peak	-	07:00	06:00	-	-	-	-	-	-	06:00
Vol.	-	142	327	-	-	-	-	-	-	438
PM Peak	-	17:00	16:00	-	-	-	-	-	-	17:00
Vol.	-	365	210	-	-	-	-	-	-	575
Grand Total		2802	2782							5584
Percent		50.2%	49.8%							
ADT		ADT 5,551	AADT 5,551							

LEVEL OF SERVICE DEFINITIONS

From *Highway Capacity Manual*, Transportation Research Board, 2016, 6th Edition

SIGNALIZED INTERSECTION LEVEL OF SERVICE (LOS)

<u>LOS</u>	<u>Average Vehicle Delay</u> sec/vehicle	<u>Operational Characteristics</u>
A	<10 seconds	Describes operations with low control delay, up to 10 sec/veh. This LOS occurs when progression is extremely favorable and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.
B	10 to 20 seconds	Describes operations with control delay greater than 10 seconds and up to 20 sec/veh. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of delay.
C	20 to 35 seconds	Describes operations with control delay greater than 20 and up to 35 sec/veh. These higher delays may result from only fair progression, longer cycle length, or both. Individual cycle failures may begin to appear at this level. Cycle failure occurs when a given green phase does not serve queued vehicles, and overflows occur. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.
D	35 to 55 seconds	Describes operations with control delay greater than 35 and up to 55 sec/veh. At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, and high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	55 to 80 seconds	Describes operations with control delay greater than 55 and up to 80 sec/veh. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent.
F	>80 seconds	Describes operations with control delay in excess of 80 sec/veh. This level, considered unacceptable to most drivers, often occurs with over-saturation, that is, when arrival flow rates exceed the capacity of lane groups. It may also occur at high v/c ratios with many individual cycle failures. Poor progression and long cycle lengths may also contribute significantly to high delay levels.

LEVEL OF SERVICE DEFINITIONS

From *Highway Capacity Manual*, Transportation Research Board, 2016, 6th Edition

UNSIGNALIZED INTERSECTION LEVEL OF SERVICE (LOS)

Applicable to Two-Way Stop Control, All-Way Stop Control, and Roundabouts

LOS	Average Vehicle Control Delay	Operational Characteristics
A	<10 seconds	Normally, vehicles on the stop-controlled approach only have to wait up to 10 seconds before being able to clear the intersection. Left-turning vehicles on the uncontrolled street do not have to wait to make their turn.
B	10 to 15 seconds	Vehicles on the stop-controlled approach will experience delays before being able to clear the intersection. <u>The delay could be up to 15 seconds.</u> Left-turning vehicles on the uncontrolled street may have to wait to make their turn.
C	15 to 25 seconds	Vehicles on the stop-controlled approach can expect delays in the range of 15 to 25 seconds before clearing the intersection. Motorists may begin to take chances due to the long delays, thereby posing a safety risk to through traffic. <u>Left-turning vehicles on the uncontrolled street will now be required to wait to make their turn causing a queue to be created in the turn lane.</u>
D	25 to 35 seconds	<u>This is the point at which a traffic signal may be warranted for this intersection.</u> The delays for the stop-controlled intersection are not considered to be excessive. The length of the queue may begin to block other public and private access points.
E	35 to 50 seconds	The delays for all critical traffic movements are considered to be unacceptable. The length of the queues for the stop-controlled approaches as well as the left-turn movements are extremely long. <u>There is a high probability that this intersection will meet traffic signal warrants.</u> The ability to install a traffic signal is affected by the location of other existing traffic signals. Consideration may be given to restricting the accesses by eliminating the left-turn movements from and to the stop-controlled approach.
F	>50 seconds	The delay for the critical traffic movements are probably in excess of 100 seconds. The length of the queues are extremely long. Motorists are selecting alternative routes due to the long delays. <u>The only remedy for these long delays is installing a traffic signal or restricting the accesses.</u> The potential for accidents at this intersection are extremely high due to motorist taking more risky chances. If the median permits, motorists begin making two-stage left-turns.

HCM 6th TWSC
3: 95th Avenue & US 34

Existing
AM Peak

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	126	784	3	4	1397	7	3	2	4	3	2	201
Future Vol, veh/h	126	784	3	4	1397	7	3	2	4	3	2	201
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	Free
Storage Length	150	-	150	150	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	142	881	3	4	1570	8	3	2	4	3	2	226
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1578	0	0	884	0	0	1959	2751	-	2304	2746	-
Stage 1	-	-	-	-	-	-	1165	1165	-	1578	1578	-
Stage 2	-	-	-	-	-	-	794	1586	-	726	1168	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	-	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	-	3.52	4.02	-
Pot Cap-1 Maneuver	413	-	-	761	-	-	38	19	0	21	20	0
Stage 1	-	-	-	-	-	-	206	267	0	114	168	0
Stage 2	-	-	-	-	-	-	348	166	0	382	266	0
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	413	-	-	761	-	-	24	12	-	13	13	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	24	12	-	13	13	-
Stage 1	-	-	-	-	-	-	135	175	-	75	167	-
Stage 2	-	-	-	-	-	-	342	165	-	247	174	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	2.5			0								
HCM LOS							-			-		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	413	-	-	761	-	-	-				
HCM Lane V/C Ratio	-	0.343	-	-	0.006	-	-	-				
HCM Control Delay (s)	-	18.2	-	-	9.8	-	-	-				
HCM Lane LOS	-	C	-	-	A	-	-	-				
HCM 95th %tile O(veh)	-	1.5	-	-	0	-	-	-				

HCM 6th TWSC
6: 95th Avenue & W. 37th Street

Existing
AM Peak

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	130	4	0	324	1	3	0	2	1	3	5
Future Vol, veh/h	1	130	4	0	324	1	3	0	2	1	3	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	135	4	0	338	1	3	0	2	1	3	5
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	339	0	0	139	0	0	482	478	137	479	480	339
Stage 1	-	-	-	-	-	-	139	139	-	339	339	-
Stage 2	-	-	-	-	-	-	343	339	-	140	141	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1220	-	-	1445	-	-	495	486	911	497	485	703
Stage 1	-	-	-	-	-	-	864	782	-	676	640	-
Stage 2	-	-	-	-	-	-	672	640	-	863	780	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1220	-	-	1445	-	-	489	486	911	496	485	703
Mov Cap-2 Maneuver	-	-	-	-	-	-	489	486	-	496	485	-
Stage 1	-	-	-	-	-	-	863	781	-	675	640	-
Stage 2	-	-	-	-	-	-	664	640	-	860	779	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0			11.1			11.2		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	600	1220	-	-	1445	-	-	588				
HCM Lane V/C Ratio	0.009	0.001	-	-	-	-	-	0.016				
HCM Control Delay (s)	11.1	8	0	-	0	-	-	11.2				
HCM Lane LOS	B	A	A	-	A	-	-	B				
HCM 95th %tile O(veh)	0	0	-	-	0	-	-	0				

Timings 9: 83rd Avenue & US 34

Existing
AM Peak

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	8	785	24	19	1369	81	50	16	97	54
Future Volume (vph)	8	785	24	19	1369	81	50	16	97	54
Turn Type	Prot	NA	Perm	Prot	NA	Perm	NA	Perm	NA	Perm
Protected Phases	7	4		3	8		2		6	
Permitted Phases			4			8		2		6
Detector Phase	7	4	4	3	8	8	2	2	6	6
Switch Phase										
Minimum Initial (s)	7.5	10.5	10.5	7.5	10.5	10.5	15.5	15.5	15.5	15.5
Minimum Split (s)	12.0	15.0	15.0	12.0	15.0	15.0	20.0	20.0	20.0	20.0
Total Split (s)	12.0	64.0	64.0	12.0	64.0	64.0	21.0	21.0	23.0	23.0
Total Split (%)	10.0%	53.3%	53.3%	10.0%	53.3%	53.3%	17.5%	17.5%	19.2%	19.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None
Act Effect Green (s)	7.5	71.6	71.6	7.5	74.0	74.0	15.5	15.5	18.6	18.6
Actuated g/C Ratio	0.06	0.60	0.60	0.06	0.62	0.62	0.13	0.13	0.16	0.16
v/c Ratio	0.08	0.40	0.03	0.18	0.67	0.08	0.36	0.06	0.83	0.18
Control Delay	54.9	15.7	0.0	57.5	19.3	2.6	52.5	0.4	73.7	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.9	15.7	0.0	57.5	19.3	2.6	52.5	0.4	73.7	3.4
LOS	D	B	A	E	B	A	D	A	E	A
Approach Delay		15.6			18.8		43.7		60.0	
Approach LOS		B			B		D		E	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 23.0

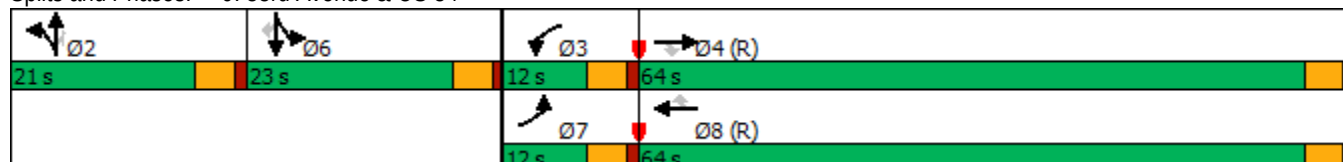
Intersection LOS: C

Intersection Capacity Utilization 74.9%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 9: 83rd Avenue & US 34



HCM 6th TWSC
10: 83rd Avenue & W. 37th Street

Existing
AM Peak

Intersection												
Int Delay, s/veh	6.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	121	6	68	300	20	8	72	17	7	113	5
Future Vol, veh/h	0	121	6	68	300	20	8	72	17	7	113	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	129	6	72	319	21	9	77	18	7	120	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	340	0	0	135	0	0	665	613	129	654	609	330
Stage 1	-	-	-	-	-	-	129	129	-	474	474	-
Stage 2	-	-	-	-	-	-	536	484	-	180	135	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1219	-	-	1449	-	-	374	408	921	380	410	712
Stage 1	-	-	-	-	-	-	875	789	-	571	558	-
Stage 2	-	-	-	-	-	-	529	552	-	822	785	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1219	-	-	1449	-	-	273	388	921	304	390	712
Mov Cap-2 Maneuver	-	-	-	-	-	-	273	388	-	304	390	-
Stage 1	-	-	-	-	-	-	875	789	-	571	530	-
Stage 2	-	-	-	-	-	-	386	524	-	728	785	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			1.3			16.5			18.9		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	416	1219	-	-	1449	-	-	391
HCM Lane V/C Ratio	0.248	-	-	-	0.05	-	-	0.34
HCM Control Delay (s)	16.5	0	-	-	7.6	-	-	18.9
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	1	0	-	-	0.2	-	-	1.5

HCM 6th TWSC
3: 95th Avenue & US 34

Existing
PM Peak

Intersection												
Int Delay, s/veh	1.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	318	1426	0	2	1020	16	0	1	5	8	0	226
Future Vol, veh/h	318	1426	0	2	1020	16	0	1	5	8	0	226
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	Free
Storage Length	150	-	150	150	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	328	1470	0	2	1052	16	0	1	5	8	0	233
Major/Minor	Major1		Major2			Minor1			Minor2			
Conflicting Flow All	1068	0	0	1470	0	0	2656	3198	-	2448	3182	-
Stage 1	-	-	-	-	-	-	2126	2126	-	1056	1056	-
Stage 2	-	-	-	-	-	-	530	1072	-	1392	2126	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	-	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	-	3.52	4.02	-
Pot Cap-1 Maneuver	648	-	-	455	-	-	11	10	0	16	10	0
Stage 1	-	-	-	-	-	-	51	89	0	241	300	0
Stage 2	-	-	-	-	-	-	500	295	0	149	89	0
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	648	-	-	455	-	-	7	5	-	~ 8	5	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	7	5	-	~ 8	5	-
Stage 1	-	-	-	-	-	-	25	44	-	119	299	-
Stage 2	-	-	-	-	-	-	498	294	-	72	44	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	2.9		0									
HCM LOS						-			-			
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	648	-	-	455	-	-	-				
HCM Lane V/C Ratio	-	0.506	-	-	0.005	-	-	-				
HCM Control Delay (s)	-	16.1	-	-	12.9	-	-	-				
HCM Lane LOS	-	C	-	-	B	-	-	-				
HCM 95th %tile Q(veh)	-	2.9	-	-	0	-	-	-				
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s			+: Computation Not Defined				*: All major volume in platoon			

HCM 6th TWSC
6: 95th Avenue & W. 37th Street

Existing
PM Peak

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	368	0	2	170	0	3	5	5	2	0	0
Future Vol, veh/h	2	368	0	2	170	0	3	5	5	2	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	396	0	2	183	0	3	5	5	2	0	0
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	183	0	0	396	0	0	587	587	396	592	587	183
Stage 1	-	-	-	-	-	-	400	400	-	187	187	-
Stage 2	-	-	-	-	-	-	187	187	-	405	400	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1392	-	-	1163	-	-	421	422	653	418	422	859
Stage 1	-	-	-	-	-	-	626	602	-	815	745	-
Stage 2	-	-	-	-	-	-	815	745	-	622	602	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1392	-	-	1163	-	-	420	420	653	409	420	859
Mov Cap-2 Maneuver	-	-	-	-	-	-	420	420	-	409	420	-
Stage 1	-	-	-	-	-	-	625	601	-	813	744	-
Stage 2	-	-	-	-	-	-	813	744	-	610	601	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.1			12.6			13.8		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	487	1392	-	-	1163	-	-	409				
HCM Lane V/C Ratio	0.029	0.002	-	-	0.002	-	-	0.005				
HCM Control Delay (s)	12.6	7.6	0	-	8.1	0	-	13.8				
HCM Lane LOS	B	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0				

Timings 9: 83rd Avenue & US 34

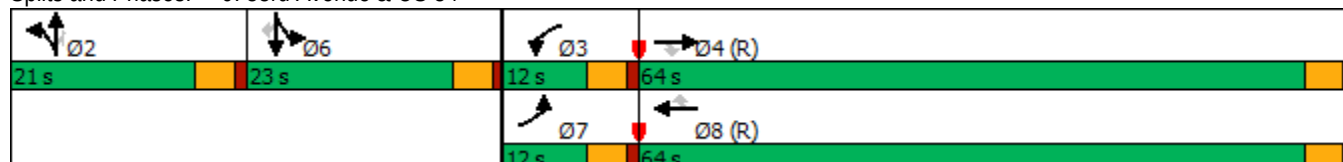
Existing
PM Peak

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	50	1420	27	28	1010	153	157	25	103	36
Future Volume (vph)	50	1420	27	28	1010	153	157	25	103	36
Turn Type	Prot	NA	Perm	Prot	NA	Perm	NA	Perm	NA	Perm
Protected Phases	7	4		3	8		2		6	
Permitted Phases			4			8		2		6
Detector Phase	7	4	4	3	8	8	2	2	6	6
Switch Phase										
Minimum Initial (s)	7.5	10.5	10.5	7.5	10.5	10.5	15.5	15.5	15.5	15.5
Minimum Split (s)	12.0	15.0	15.0	12.0	15.0	15.0	20.0	20.0	20.0	20.0
Total Split (s)	12.0	64.0	64.0	12.0	64.0	64.0	21.0	21.0	23.0	23.0
Total Split (%)	10.0%	53.3%	53.3%	10.0%	53.3%	53.3%	17.5%	17.5%	19.2%	19.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None
Act Effect Green (s)	7.5	65.2	65.2	7.5	62.8	62.8	16.3	16.3	17.8	17.8
Actuated g/C Ratio	0.06	0.54	0.54	0.06	0.52	0.52	0.14	0.14	0.15	0.15
v/c Ratio	0.47	0.76	0.03	0.26	0.56	0.18	0.84	0.09	0.84	0.12
Control Delay	68.9	26.0	0.1	60.0	21.7	5.4	78.6	0.6	75.9	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.9	26.0	0.1	60.0	21.7	5.4	78.6	0.6	75.9	0.8
LOS	E	C	A	E	C	A	E	A	E	A
Approach Delay		27.0			20.5		70.0		65.3	
Approach LOS		C			C		E		E	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 30.7
Intersection Capacity Utilization 78.6%
Analysis Period (min) 15
Intersection LOS: C
ICU Level of Service D

Splits and Phases: 9: 83rd Avenue & US 34



HCM 6th TWSC
10: 83rd Avenue & W. 37th Street

Existing
PM Peak

Intersection												
Int Delay, s/veh	16.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	360	9	79	158	25	8	144	82	31	126	2
Future Vol, veh/h	15	360	9	79	158	25	8	144	82	31	126	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	387	10	85	170	27	9	155	88	33	135	2
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	197	0	0	397	0	0	841	786	387	900	783	184
Stage 1	-	-	-	-	-	-	419	419	-	354	354	-
Stage 2	-	-	-	-	-	-	422	367	-	546	429	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1376	-	-	1162	-	-	284	324	661	259	325	858
Stage 1	-	-	-	-	-	-	612	590	-	663	630	-
Stage 2	-	-	-	-	-	-	609	622	-	522	584	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1376	-	-	1162	-	-	172	297	661	125	298	858
Mov Cap-2 Maneuver	-	-	-	-	-	-	172	297	-	125	298	-
Stage 1	-	-	-	-	-	-	605	583	-	655	584	-
Stage 2	-	-	-	-	-	-	432	577	-	328	577	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			2.5			35.9			52.2		
HCM LOS							E			F		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	357	1376	-	-	1162	-	-	236				
HCM Lane V/C Ratio	0.705	0.012	-	-	0.073	-	-	0.724				
HCM Control Delay (s)	35.9	7.6	-	-	8.3	-	-	52.2				
HCM Lane LOS	E	A	-	-	A	-	-	F				
HCM 95th %tile O(veh)	5.2	0	-	-	0.2	-	-	4.9				

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	130	808	3	4	1439	7	3	2	4	3	2	207
Future Vol, veh/h	130	808	3	4	1439	7	3	2	4	3	2	207
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	Free
Storage Length	150	-	150	150	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	146	908	3	4	1617	8	3	2	4	3	2	233
Major/Minor	Major1			Major2			Minor1		Minor2			
Conflicting Flow All	1625	0	0	911	0	0	2018	2833	-	2372	2828	-
Stage 1	-	-	-	-	-	-	1200	1200	-	1625	1625	-
Stage 2	-	-	-	-	-	-	818	1633	-	747	1203	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	-	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	-	3.52	4.02	-
Pot Cap-1 Maneuver	396	-	-	743	-	-	34	17	0	18	17	0
Stage 1	-	-	-	-	-	-	196	256	0	107	159	0
Stage 2	-	-	-	-	-	-	336	158	0	371	256	0
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	396	-	-	743	-	-	21	11	-	11	11	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	21	11	-	11	11	-
Stage 1	-	-	-	-	-	-	124	162	-	68	158	-
Stage 2	-	-	-	-	-	-	329	157	-	231	162	-
Approach	EB			WB			NB		SB			
HCM Control Delay, s	2.7			0								
HCM LOS							-		-			
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	396	-	-	743	-	-	-				
HCM Lane V/C Ratio	-	0.369	-	-	0.006	-	-	-				
HCM Control Delay (s)	-	19.3	-	-	9.9	-	-	-				
HCM Lane LOS	-	C	-	-	A	-	-	-				
HCM 95th %tile Q(veh)	-	1.7	-	-	0	-	-	-				

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	134	4	0	334	1	3	0	2	1	3	5
Future Vol, veh/h	1	134	4	0	334	1	3	0	2	1	3	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	140	4	0	348	1	3	0	2	1	3	5
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	349	0	0	144	0	0	497	493	142	494	495	349
Stage 1	-	-	-	-	-	-	144	144	-	349	349	-
Stage 2	-	-	-	-	-	-	353	349	-	145	146	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1210	-	-	1438	-	-	483	477	906	486	476	694
Stage 1	-	-	-	-	-	-	859	778	-	667	633	-
Stage 2	-	-	-	-	-	-	664	633	-	858	776	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1210	-	-	1438	-	-	477	477	906	485	476	694
Mov Cap-2 Maneuver	-	-	-	-	-	-	477	477	-	485	476	-
Stage 1	-	-	-	-	-	-	858	777	-	666	633	-
Stage 2	-	-	-	-	-	-	656	633	-	855	775	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0			11.2			11.3		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	588	1210	-	-	1438	-	-	578				
HCM Lane V/C Ratio	0.009	0.001	-	-	-	-	-	0.016				
HCM Control Delay (s)	11.2	8	0	-	0	-	-	11.3				
HCM Lane LOS	B	A	A	-	A	-	-	B				
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0				

Timings 9: 83rd Avenue & US 34

2023 Background
AM Peak

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	8	809	25	20	1410	83	52	16	100	56
Future Volume (vph)	8	809	25	20	1410	83	52	16	100	56
Turn Type	Prot	NA	Perm	Prot	NA	Perm	NA	Perm	NA	Perm
Protected Phases	7	4		3	8		2		6	
Permitted Phases			4			8		2		6
Detector Phase	7	4	4	3	8	8	2	2	6	6
Switch Phase										
Minimum Initial (s)	7.5	10.5	10.5	7.5	10.5	10.5	15.5	15.5	15.5	15.5
Minimum Split (s)	12.0	15.0	15.0	12.0	15.0	15.0	20.0	20.0	20.0	20.0
Total Split (s)	12.0	64.0	64.0	12.0	64.0	64.0	21.0	21.0	23.0	23.0
Total Split (%)	10.0%	53.3%	53.3%	10.0%	53.3%	53.3%	17.5%	17.5%	19.2%	19.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None
Act Effect Green (s)	7.5	71.5	71.5	7.5	73.9	73.9	15.5	15.5	18.7	18.7
Actuated g/C Ratio	0.06	0.60	0.60	0.06	0.62	0.62	0.13	0.13	0.16	0.16
v/c Ratio	0.08	0.41	0.03	0.19	0.69	0.09	0.37	0.06	0.85	0.18
Control Delay	54.9	15.9	0.0	57.7	19.9	2.7	52.8	0.4	76.0	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.9	15.9	0.0	57.7	19.9	2.7	52.8	0.4	76.0	3.9
LOS	D	B	A	E	B	A	D	A	E	A
Approach Delay		15.8			19.5		44.2		61.6	
Approach LOS		B			B		D		E	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 23.6

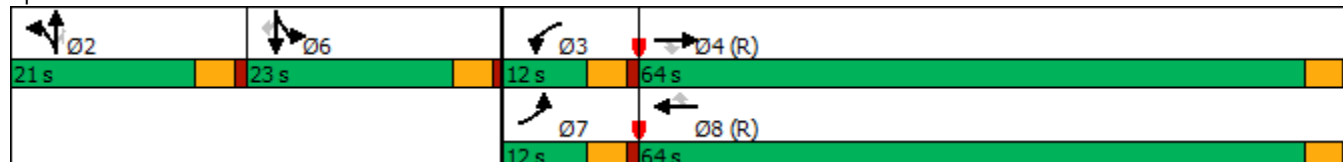
Intersection LOS: C

Intersection Capacity Utilization 76.1%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 9: 83rd Avenue & US 34



Intersection												
Int Delay, s/veh	6.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	125	6	70	309	21	8	74	18	7	116	5
Future Vol, veh/h	0	125	6	70	309	21	8	74	18	7	116	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	133	6	74	329	22	9	79	19	7	123	5
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	351	0	0	139	0	0	685	632	133	673	627	340
Stage 1	-	-	-	-	-	-	133	133	-	488	488	-
Stage 2	-	-	-	-	-	-	552	499	-	185	139	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1208	-	-	1445	-	-	362	398	916	369	400	702
Stage 1	-	-	-	-	-	-	870	786	-	561	550	-
Stage 2	-	-	-	-	-	-	518	544	-	817	782	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1208	-	-	1445	-	-	259	378	916	292	380	702
Mov Cap-2 Maneuver	-	-	-	-	-	-	259	378	-	292	380	-
Stage 1	-	-	-	-	-	-	870	786	-	561	522	-
Stage 2	-	-	-	-	-	-	372	516	-	720	782	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			1.3			17			19.6		
HCM LOS							C			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	406	1208	-	-	1445	-	-	381				
HCM Lane V/C Ratio	0.262	-	-	-	0.052	-	-	0.357				
HCM Control Delay (s)	17	0	-	-	7.6	-	-	19.6				
HCM Lane LOS	C	A	-	-	A	-	-	C				
HCM 95th %tile Q(veh)	1	0	-	-	0.2	-	-	1.6				

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	328	1469	0	2	1051	16	0	1	5	8	0	233
Future Vol, veh/h	328	1469	0	2	1051	16	0	1	5	8	0	233
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	Free
Storage Length	150	-	150	150	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	338	1514	0	2	1084	16	0	1	5	8	0	240
Major/Minor	Major1		Major2			Minor1		Minor2				
Conflicting Flow All	1100	0	0	1514	0	0	2736	3294	-	2522	3278	-
Stage 1	-	-	-	-	-	-	2190	2190	-	1088	1088	-
Stage 2	-	-	-	-	-	-	546	1104	-	1434	2190	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	-	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	-	3.52	4.02	-
Pot Cap-1 Maneuver	630	-	-	437	-	-	10	9	0	14	9	0
Stage 1	-	-	-	-	-	-	46	82	0	230	290	0
Stage 2	-	-	-	-	-	-	490	285	0	141	82	0
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	630	-	-	437	-	-	6	4	-	~ 7	4	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	6	4	-	~ 7	4	-
Stage 1	-	-	-	-	-	-	21	38	-	106	289	-
Stage 2	-	-	-	-	-	-	488	284	-	64	38	-
Approach	EB		WB			NB		SB				
HCM Control Delay, s	3.1			0								
HCM LOS							-			-		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	630	-	-	437	-	-	-				
HCM Lane V/C Ratio	-	0.537	-	-	0.005	-	-	-				
HCM Control Delay (s)	-	17.1	-	-	13.3	-	-	-				
HCM Lane LOS	-	C	-	-	B	-	-	-				
HCM 95th %tile Q(veh)	-	3.2	-	-	0	-	-	-				
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s			+: Computation Not Defined				*: All major volume in platoon			

Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	379	0	2	175	0	3	5	5	2	0	0
Future Vol, veh/h	2	379	0	2	175	0	3	5	5	2	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	408	0	2	188	0	3	5	5	2	0	0
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	188	0	0	408	0	0	604	604	408	609	604	188
Stage 1	-	-	-	-	-	-	412	412	-	192	192	-
Stage 2	-	-	-	-	-	-	192	192	-	417	412	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1386	-	-	1151	-	-	410	412	643	407	412	854
Stage 1	-	-	-	-	-	-	617	594	-	810	742	-
Stage 2	-	-	-	-	-	-	810	742	-	613	594	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1386	-	-	1151	-	-	409	410	643	398	410	854
Mov Cap-2 Maneuver	-	-	-	-	-	-	409	410	-	398	410	-
Stage 1	-	-	-	-	-	-	616	593	-	808	741	-
Stage 2	-	-	-	-	-	-	808	741	-	601	593	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.1			12.8			14.1		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	476	1386	-	-	1151	-	-	398				
HCM Lane V/C Ratio	0.029	0.002	-	-	0.002	-	-	0.005				
HCM Control Delay (s)	12.8	7.6	0	-	8.1	0	-	14.1				
HCM Lane LOS	B	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0				

Timings 9: 83rd Avenue & US 34

2023 Background
PM Peak

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	52	1463	28	29	1040	158	162	26	106	37
Future Volume (vph)	52	1463	28	29	1040	158	162	26	106	37
Turn Type	Prot	NA	Perm	Prot	NA	Perm	NA	Perm	NA	Perm
Protected Phases	7	4		3	8		2		6	
Permitted Phases			4			8		2		6
Detector Phase	7	4	4	3	8	8	2	2	6	6
Switch Phase										
Minimum Initial (s)	7.5	10.5	10.5	7.5	10.5	10.5	15.5	15.5	15.5	15.5
Minimum Split (s)	12.0	15.0	15.0	12.0	15.0	15.0	20.0	20.0	20.0	20.0
Total Split (s)	12.0	64.0	64.0	12.0	64.0	64.0	21.0	21.0	23.0	23.0
Total Split (%)	10.0%	53.3%	53.3%	10.0%	53.3%	53.3%	17.5%	17.5%	19.2%	19.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None
Act Effect Green (s)	7.5	65.1	65.1	7.5	62.7	62.7	16.3	16.3	17.9	17.9
Actuated g/C Ratio	0.06	0.54	0.54	0.06	0.52	0.52	0.14	0.14	0.15	0.15
v/c Ratio	0.49	0.79	0.03	0.27	0.58	0.18	0.86	0.09	0.86	0.12
Control Delay	69.9	27.0	0.1	60.3	22.1	5.7	81.9	0.6	78.4	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.9	27.0	0.1	60.3	22.1	5.7	81.9	0.6	78.4	0.8
LOS	E	C	A	E	C	A	F	A	E	A
Approach Delay		28.0			20.9		72.9		67.5	
Approach LOS		C			C		E		E	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 31.7

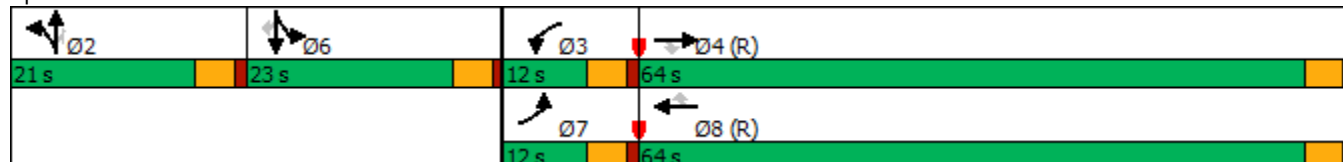
Intersection LOS: C

Intersection Capacity Utilization 80.3%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 9: 83rd Avenue & US 34



Intersection												
Int Delay, s/veh	19.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	371	9	81	163	26	8	148	84	32	130	2
Future Vol, veh/h	15	371	9	81	163	26	8	148	84	32	130	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	399	10	87	175	28	9	159	90	34	140	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	203	0	0	409	0	0	865	808	399	924	804	189
Stage 1	-	-	-	-	-	-	431	431	-	363	363	-
Stage 2	-	-	-	-	-	-	434	377	-	561	441	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1369	-	-	1150	-	-	274	315	651	250	316	853
Stage 1	-	-	-	-	-	-	603	583	-	656	625	-
Stage 2	-	-	-	-	-	-	600	616	-	512	577	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1369	-	-	1150	-	-	159	288	651	114	289	853
Mov Cap-2 Maneuver	-	-	-	-	-	-	159	288	-	114	289	-
Stage 1	-	-	-	-	-	-	596	576	-	648	578	-
Stage 2	-	-	-	-	-	-	419	569	-	315	570	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			2.5			40.5			62.6		
HCM LOS							E			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	346	1369	-	-	1150	-	-	224
HCM Lane V/C Ratio	0.746	0.012	-	-	0.076	-	-	0.787
HCM Control Delay (s)	40.5	7.7	-	-	8.4	-	-	62.6
HCM Lane LOS	E	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	5.8	0	-	-	0.2	-	-	5.7

HCM 6th TWSC
3: 95th Avenue & US 34

2023 Total
AM Peak

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	130	808	11	12	1439	7	3	2	12	3	2	207
Future Vol, veh/h	130	808	11	12	1439	7	3	2	12	3	2	207
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	Free
Storage Length	150	-	150	150	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	146	908	12	13	1617	8	3	2	13	3	2	233
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1625	0	0	920	0	0	2036	2851	-	2390	2855	-
Stage 1	-	-	-	-	-	-	1200	1200	-	1643	1643	-
Stage 2	-	-	-	-	-	-	836	1651	-	747	1212	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	-	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	-	3.52	4.02	-
Pot Cap-1 Maneuver	396	-	-	738	-	-	33	17	0	18	17	0
Stage 1	-	-	-	-	-	-	196	256	0	104	156	0
Stage 2	-	-	-	-	-	-	328	155	0	371	253	0
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	396	-	-	738	-	-	20	11	-	11	11	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	20	11	-	11	11	-
Stage 1	-	-	-	-	-	-	124	162	-	66	153	-
Stage 2	-	-	-	-	-	-	317	152	-	231	160	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	2.6			0.1								
HCM LOS							-			-		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	396	-	-	738	-	-	-				
HCM Lane V/C Ratio	-	0.369	-	-	0.018	-	-	-				
HCM Control Delay (s)	-	19.3	-	-	10	-	-	-				
HCM Lane LOS	-	C	-	-	A	-	-	-				
HCM 95th %tile Q(veh)	-	1.7	-	-	0.1	-	-	-				

HCM 6th TWSC
6: 95th Avenue & W. 37th Street

2023 Total
AM Peak

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	134	4	0	334	1	3	0	2	1	3	12
Future Vol, veh/h	1	134	4	0	334	1	3	0	2	1	3	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	140	4	0	348	1	3	0	2	1	3	13
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	349	0	0	144	0	0	501	493	142	494	495	349
Stage 1	-	-	-	-	-	-	144	144	-	349	349	-
Stage 2	-	-	-	-	-	-	357	349	-	145	146	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1210	-	-	1438	-	-	480	477	906	486	476	694
Stage 1	-	-	-	-	-	-	859	778	-	667	633	-
Stage 2	-	-	-	-	-	-	661	633	-	858	776	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1210	-	-	1438	-	-	468	477	906	485	476	694
Mov Cap-2 Maneuver	-	-	-	-	-	-	468	477	-	485	476	-
Stage 1	-	-	-	-	-	-	858	777	-	666	633	-
Stage 2	-	-	-	-	-	-	646	633	-	855	775	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0			11.3			10.9		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	580	1210	-	-	1438	-	-	624				
HCM Lane V/C Ratio	0.009	0.001	-	-	-	-	-	0.027				
HCM Control Delay (s)	11.3	8	0	-	0	-	-	10.9				
HCM Lane LOS	B	A	A	-	A	-	-	B				
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1				

Timings 9: 83rd Avenue & US 34

2023 Total
AM Peak

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	8	817	25	20	1418	83	52	16	100	56
Future Volume (vph)	8	817	25	20	1418	83	52	16	100	56
Turn Type	Prot	NA	Perm	Prot	NA	Perm	NA	Perm	NA	Perm
Protected Phases	7	4		3	8		2		6	
Permitted Phases			4			8		2		6
Detector Phase	7	4	4	3	8	8	2	2	6	6
Switch Phase										
Minimum Initial (s)	7.5	10.5	10.5	7.5	10.5	10.5	15.5	15.5	15.5	15.5
Minimum Split (s)	12.0	15.0	15.0	12.0	15.0	15.0	20.0	20.0	20.0	20.0
Total Split (s)	12.0	64.0	64.0	12.0	64.0	64.0	21.0	21.0	23.0	23.0
Total Split (%)	10.0%	53.3%	53.3%	10.0%	53.3%	53.3%	17.5%	17.5%	19.2%	19.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None
Act Effect Green (s)	7.5	71.5	71.5	7.5	73.9	73.9	15.5	15.5	18.7	18.7
Actuated g/C Ratio	0.06	0.60	0.60	0.06	0.62	0.62	0.13	0.13	0.16	0.16
v/c Ratio	0.08	0.41	0.03	0.19	0.69	0.09	0.37	0.06	0.85	0.18
Control Delay	54.9	15.9	0.0	57.7	20.0	2.7	52.8	0.4	76.0	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.9	15.9	0.0	57.7	20.0	2.7	52.8	0.4	76.0	3.9
LOS	D	B	A	E	C	A	D	A	E	A
Approach Delay		15.9			19.6		44.2		61.6	
Approach LOS		B			B		D		E	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 23.6

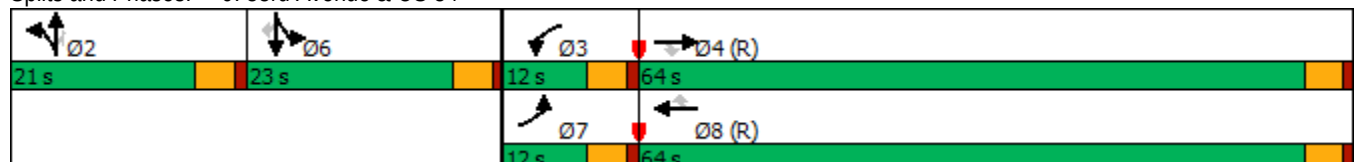
Intersection LOS: C

Intersection Capacity Utilization 76.3%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 9: 83rd Avenue & US 34



HCM 6th TWSC
10: 83rd Avenue & W. 37th Street

2023 Total
AM Peak

Intersection												
Int Delay, s/veh	6.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	125	6	70	309	21	8	74	18	7	116	5
Future Vol, veh/h	0	125	6	70	309	21	8	74	18	7	116	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	133	6	74	329	22	9	79	19	7	123	5
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	351	0	0	139	0	0	685	632	133	673	627	340
Stage 1	-	-	-	-	-	-	133	133	-	488	488	-
Stage 2	-	-	-	-	-	-	552	499	-	185	139	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1208	-	-	1445	-	-	362	398	916	369	400	702
Stage 1	-	-	-	-	-	-	870	786	-	561	550	-
Stage 2	-	-	-	-	-	-	518	544	-	817	782	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1208	-	-	1445	-	-	259	378	916	292	380	702
Mov Cap-2 Maneuver	-	-	-	-	-	-	259	378	-	292	380	-
Stage 1	-	-	-	-	-	-	870	786	-	561	522	-
Stage 2	-	-	-	-	-	-	372	516	-	720	782	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			1.3			17			19.6		
HCM LOS							C			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	406	1208	-	-	1445	-	-	381				
HCM Lane V/C Ratio	0.262	-	-	-	0.052	-	-	0.357				
HCM Control Delay (s)	17	0	-	-	7.6	-	-	19.6				
HCM Lane LOS	C	A	-	-	A	-	-	C				
HCM 95th %tile Q(veh)	1	0	-	-	0.2	-	-	1.6				

HCM 6th TWSC
3: 95th Avenue & US 34

2023 Total
PM Peak

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	328	1469	8	9	1051	16	0	1	13	8	0	233
Future Vol, veh/h	328	1469	8	9	1051	16	0	1	13	8	0	233
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	Free
Storage Length	150	-	150	150	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	338	1514	8	9	1084	16	0	1	13	8	0	240

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1100	0	0	1522	0	0	2750	3308	-	2536	3300	-
Stage 1	-	-	-	-	-	-	2190	2190	-	1102	1102	-
Stage 2	-	-	-	-	-	-	560	1118	-	1434	2198	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	-	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	-	3.52	4.02	-
Pot Cap-1 Maneuver	630	-	-	434	-	-	9	8	0	14	8	0
Stage 1	-	-	-	-	-	-	46	82	0	226	286	0
Stage 2	-	-	-	-	-	-	480	281	0	141	82	0
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	630	-	-	434	-	-	5	4	-	~ 7	4	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	5	4	-	~ 7	4	-
Stage 1	-	-	-	-	-	-	21	38	-	105	280	-
Stage 2	-	-	-	-	-	-	470	275	-	64	38	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.1	0.1		
HCM LOS			-	-

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	630	-	-	434	-	-	-
HCM Lane V/C Ratio	-	0.537	-	-	0.021	-	-	-
HCM Control Delay (s)	-	17.1	-	-	13.5	-	-	-
HCM Lane LOS	-	C	-	-	B	-	-	-
HCM 95th %tile Q(veh)	-	3.2	-	-	0.1	-	-	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 6th TWSC
6: 95th Avenue & W. 37th Street

2023 Total
PM Peak

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	379	0	2	175	0	3	5	5	2	0	8
Future Vol, veh/h	2	379	0	2	175	0	3	5	5	2	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	408	0	2	188	0	3	5	5	2	0	9
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	188	0	0	408	0	0	609	604	408	609	604	188
Stage 1	-	-	-	-	-	-	412	412	-	192	192	-
Stage 2	-	-	-	-	-	-	197	192	-	417	412	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1386	-	-	1151	-	-	407	412	643	407	412	854
Stage 1	-	-	-	-	-	-	617	594	-	810	742	-
Stage 2	-	-	-	-	-	-	805	742	-	613	594	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1386	-	-	1151	-	-	402	410	643	398	410	854
Mov Cap-2 Maneuver	-	-	-	-	-	-	402	410	-	398	410	-
Stage 1	-	-	-	-	-	-	616	593	-	808	741	-
Stage 2	-	-	-	-	-	-	795	741	-	601	593	-
Approach	EB		WB				NB		SB			
HCM Control Delay, s	0		0.1				12.8		10.3			
HCM LOS							B		B			
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	474	1386	-	-	1151	-	-	695				
HCM Lane V/C Ratio	0.029	0.002	-	-	0.002	-	-	0.015				
HCM Control Delay (s)	12.8	7.6	0	-	8.1	0	-	10.3				
HCM Lane LOS	B	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0				

Timings 9: 83rd Avenue & US 34

2023 Total
PM Peak

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	52	1471	28	29	1047	158	162	26	106	37
Future Volume (vph)	52	1471	28	29	1047	158	162	26	106	37
Turn Type	Prot	NA	Perm	Prot	NA	Perm	NA	Perm	NA	Perm
Protected Phases	7	4		3	8		2		6	
Permitted Phases			4			8		2		6
Detector Phase	7	4	4	3	8	8	2	2	6	6
Switch Phase										
Minimum Initial (s)	7.5	10.5	10.5	7.5	10.5	10.5	15.5	15.5	15.5	15.5
Minimum Split (s)	12.0	15.0	15.0	12.0	15.0	15.0	20.0	20.0	20.0	20.0
Total Split (s)	12.0	64.0	64.0	12.0	64.0	64.0	21.0	21.0	23.0	23.0
Total Split (%)	10.0%	53.3%	53.3%	10.0%	53.3%	53.3%	17.5%	17.5%	19.2%	19.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None
Act Effect Green (s)	7.5	65.1	65.1	7.5	62.7	62.7	16.3	16.3	17.9	17.9
Actuated g/C Ratio	0.06	0.54	0.54	0.06	0.52	0.52	0.14	0.14	0.15	0.15
v/c Ratio	0.49	0.79	0.03	0.27	0.58	0.18	0.86	0.09	0.86	0.12
Control Delay	69.9	27.2	0.1	60.3	22.1	5.7	81.9	0.6	78.4	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.9	27.2	0.1	60.3	22.1	5.7	81.9	0.6	78.4	0.8
LOS	E	C	A	E	C	A	F	A	E	A
Approach Delay		28.1			20.9		72.9		67.5	
Approach LOS		C			C		E		E	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 31.8

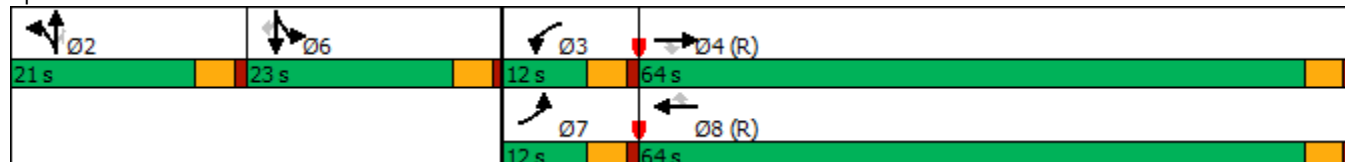
Intersection LOS: C

Intersection Capacity Utilization 80.3%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 9: 83rd Avenue & US 34



HCM 6th TWSC
10: 83rd Avenue & W. 37th Street

2023 Total
PM Peak

Intersection												
Int Delay, s/veh	19.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	371	9	81	163	26	8	148	84	32	130	2
Future Vol, veh/h	15	371	9	81	163	26	8	148	84	32	130	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	399	10	87	175	28	9	159	90	34	140	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	203	0	0	409	0	0	865	808	399	924	804	189
Stage 1	-	-	-	-	-	-	431	431	-	363	363	-
Stage 2	-	-	-	-	-	-	434	377	-	561	441	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1369	-	-	1150	-	-	274	315	651	250	316	853
Stage 1	-	-	-	-	-	-	603	583	-	656	625	-
Stage 2	-	-	-	-	-	-	600	616	-	512	577	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1369	-	-	1150	-	-	159	288	651	114	289	853
Mov Cap-2 Maneuver	-	-	-	-	-	-	159	288	-	114	289	-
Stage 1	-	-	-	-	-	-	596	576	-	648	578	-
Stage 2	-	-	-	-	-	-	419	569	-	315	570	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			2.5			40.5			62.6		
HCM LOS							E			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	346	1369	-	-	1150	-	-	224
HCM Lane V/C Ratio	0.746	0.012	-	-	0.076	-	-	0.787
HCM Control Delay (s)	40.5	7.7	-	-	8.4	-	-	62.6
HCM Lane LOS	E	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	5.8	0	-	-	0.2	-	-	5.7