

**EXISTING PEAK HOUR LEVELS OF SERVICE
FREEWAY SEGMENTS**

Location	Existing Year 2013 A.M. Peak Hour LOS/Density (pc/mi/ln)	Existing Year 2013 P.M. Peak Hour LOS/Density (pc/mi/ln)
I-80 EB between Int. 303 and 304	B (12.5)	B (16.2)
I-80 EB between Int. 304 and 305	C (21.2)	C (24.0)
I-80 EB between Int. 305 and 306	C (21.9)	C (23.1)
I-80 EB between Int. 306 and 307	C (23.9)	C (23.2)
I-80 WB between Int. 303 and 304	A (10.4)	C (22.6)
I-80 WB between Int. 304 and 305	B (15.7)	E (39.2)
I-80 WB between Int. 305 and 306	B (15.9)	E (39.7)
I-80 WB between Int. 306 and 307	B (16.9)	E (42.5)

**EXISTING PEAK HOUR LEVELS OF SERVICE
RAMP MERGES**

Location	Existing Year 2013 A.M. Peak Hour LOS/Density (pc/mi/ln)	Existing Year 2013 P.M. Peak Hour LOS/Density (pc/mi/ln)
I-80 EB Int. 304 from Rt. 209	C (21.6)	C (24.7)
I-80 EB Int. 305 from W. Main St.	C (26.9)	D (28.8)
I-80 EB Int. 306 from Dreher Ave.	D (28.3)	D (29.0)
I-80 EB Int. 307 from Park Ave.	C (26.1)	C (27.0)
I-80 WB Int. 303 from Rt. 611	B (11.1)	C (24.4)
I-80 WB Int. 307 from Broad St.	C (22.4)	E (40.2)

**EXISTING PEAK HOUR LEVELS OF SERVICE
RAMP DIVERGES**

Location	Existing Year 2013 A.M. Peak Hour LOS/Density (pc/mi/ln)	Existing Year 2013 P.M. Peak Hour LOS/Density (pc/mi/ln)
I-80 EB Int. 303 to Rt. 611	B (14.9)	B (20.0)
I-80 EB Int. 305 to W. Main St.	D (28.0)	D (30.8)
I-80 EB Int. 307 to Park Ave.	D (30.8)	D (30.1)
I-80 WB Int. 305 to W. Main St.	C (22.3)	E (42.0)
I-80 WB Int. 306 to Dreher Ave.	C (23.3)	E (43.2)
I-80 WB Int. 307 to Broad St.	C (22.5)	E (41.7)

**EXISTING PEAK HOUR LEVELS OF SERVICE
WEAVING SEGMENT**

Location	Existing Year 2013 A.M. Peak Hour LOS/Density (pc/mi/ln)	Existing Year 2013 P.M. Peak Hour LOS/Density (pc/mi/ln)
I-80 WB Int. 305 to 304	B (12.1)	D (28.2)

**EXISTING PEAK HOUR LEVELS OF SERVICE
UNSIGNALIZED INTERSECTIONS**

Intersection	Existing Year 2013 A.M. Peak Hour LOS/Delay (seconds)	Existing Year 2013 P.M. Peak Hour LOS/Delay (seconds)
Int. 303 – SR 611 and I-80 EB Off Ramp		
I-80 Off Ramp NB right	B (14.7)	C (18.9)
<i>Overall Intersection</i>	<i>A (2.1)</i>	<i>A (2.6)</i>
Int. 303 – SR 611 and Shopping Ctr. Side Rd.		
SR 611 EB left	A (9.8)	B (11.0)
Shopping Center Rd. SB left/right	B (13.1)	C (15.7)
<i>Overall Intersection</i>	<i>A (0.3)</i>	<i>A (0.4)</i>
Int. 305 – W. Main St. and I-80 EB Ramps		
W. Main St. WB left/thru	A (9.5)	A (9.9)
I-80 Off Ramp NB left/right	B (11.6)	C (15.7)
<i>Overall Intersection</i>	<i>A (6.1)</i>	<i>A (7.6)</i>
Int. 305 – W. Main St. and I-80 WB Ramps		
W. Main St. EB left/thru	A (9.6)	B (11.9)
I-80 Off Ramp SB left/right	B (11.3)	C (22.0)
<i>Overall Intersection</i>	<i>A (5.9)</i>	<i>A (8.2)</i>
Int. 306 – Dreher Ave. and I-80 EB On Ramp		
Dreher Ave. WB left/thru	A (8.9)	A (8.8)
<i>Overall Intersection</i>	<i>A (3.5)</i>	<i>A (5.7)</i>
Int. 306 – Dreher Ave. and I-80 WB Off Ramp		
I-80 Off Ramp NB left/right	A (9.4)	A (9.8)
<i>Overall Intersection</i>	<i>A (2.2)</i>	<i>A (3.5)</i>
Int. 307 – Park Ave. and I-80 EB Ramps		
Park Ave. NB left/thru	A (8.6)	A (9.5)
I-80 Off Ramp EB left/right	C (16.2)	C (24.1)
Barry St. WB left/thru/right	B (10.4)	B (13.4)
<i>Overall Intersection</i>	<i>B (11.0)</i>	<i>B (12.0)</i>
Int. 307 – Broad St. and I-80 WB Ramps		
Broad St. NB left/thru	A (9.5)	B (12.1)
I-80 Off Ramp WB left/right	B (14.8)	C (21.8)
<i>Overall Intersection</i>	<i>A (7.8)</i>	<i>A (9.3)</i>

**EXISTING PEAK HOUR LEVELS OF SERVICE
SIGNALIZED INTERSECTIONS – STROUD TOWNSHIP SYSTEM 1**

Intersection	Existing Year 2013 A.M. Peak Hour LOS/Delay (seconds)	Existing Year 2013 P.M. Peak Hour LOS/Delay (seconds)
SR 611 and Shafers School House Road		
SR 611 EB thru/right	A (6.1)	A (4.6)
SR 611 WB left	A (7.5)	A (6.5)
SR 611 WB thru	A (3.8)	A (5.0)
Shafers Sch. House Rd. NB left	C (26.9)	D (36.5)
Shafers Sch. House Rd. NB right	C (27.5)	D (36.8)
<i>Overall Intersection</i>	<i>A (6.9)</i>	<i>A (6.9)</i>
SR 611 and Applegate Road/Terrace Drive		
SR 611 EB left	A (5.5)	A (9.4)
SR 611 EB thru/right	A (7.1)	A (6.0)
SR 611 WB left	A (8.7)	A (8.2)
SR 611 WB thru/right	A (4.9)	A (7.1)
Applegate Road NB left	C (23.4)	C (33.6)
Applegate Road NB thru/right	C (22.0)	C (31.7)
Terrace Drive SB left/thru/right	C (22.5)	C (31.2)
<i>Overall Intersection</i>	<i>A (8.0)</i>	<i>A (9.1)</i>
SR 611 and Pocono Commons Drive		
SR 611 EB left	B (18.0)	C (29.3)
SR 611 EB thru	A (4.4)	A (3.8)
SR 611 WB thru	B (12.5)	B (19.0)
SR 611 WB right	A (0.0)	A (0.0)
Pocono Commons Dr. SB left	B (18.8)	C (30.6)
Pocono Commons Dr. SB right	A (0.0)	A (0.0)
<i>Overall Intersection</i>	<i>B (11.3)</i>	<i>B (19.5)</i>

**EXISTING PEAK HOUR LEVELS OF SERVICE
SIGNALIZED INTERSECTIONS – STROUD TOWNSHIP SYSTEM 2**

Intersection	Existing Year 2013 A.M. Peak Hour LOS/Delay (seconds)	Existing Year 2013 P.M. Peak Hour LOS/Delay (seconds)
SR 611 and Bridge Street		
SR 611 EB thru	B (13.4)	C (20.5)
SR 611 EB right	A (0.8)	A (1.0)
SR 611 WB left	A (2.5)	A (9.6)
SR 611 WB thru	A (2.1)	A (4.5)
Bridge Street NB left	D (51.4)	D (50.2)
Bridge Street NB right	B (10.3)	A (9.3)
<i>Overall Intersection</i>	<i>B (11.3)</i>	<i>B (14.1)</i>
SR 611 and Stroud Mall Main Drive		
SR 611 EB left	A (3.8)	A (4.8)
SR 611 EB thru/right	A (1.4)	A (1.2)
SR 611 WB left	A (1.9)	A (2.5)
SR 611 WB thru	A (3.0)	A (4.6)
SR 611 WB right	A (0.0)	A (0.0)
Driveway NB left/thru/right	D (43.8)	D (38.9)
Stroud Mall Main Dr. SB left/thru	D (40.7)	D (41.7)
Stroud Mall Main Dr. SB right	A (0.0)	A (0.0)
<i>Overall Intersection</i>	<i>A (5.9)</i>	<i>A (6.5)</i>
SR 611 and Stroud Mall East Drive		
SR 611 EB left	A (5.1)	A (4.7)
SR 611 EB thru	A (0.7)	A (0.7)
SR 611 WB thru	B (12.0)	A (7.1)
SR 611 WB right	A (6.4)	A (3.5)
Stroud Mall East Dr. SB left	E (66.8)	E (56.1)
Stroud Mall East Dr. SB right	A (0.0)	A (0.0)
<i>Overall Intersection</i>	<i>A (7.6)</i>	<i>A (6.2)</i>

**EXISTING PEAK HOUR LEVELS OF SERVICE
SIGNALIZED INTERSECTIONS – STROUD TOWNSHIP SYSTEM 2 (continued)**

Intersection	Existing Year 2013 A.M. Peak Hour LOS/Delay (seconds)	Existing Year 2013 P.M. Peak Hour LOS/Delay (seconds)
SR 611 and Chipperfield Drive		
SR 611 EB left	C (21.9)	C (21.9)
SR 611 EB thru/right	B (10.5)	B (15.4)
SR 611 WB left	B (18.0)	B (19.3)
SR 611 WB thru	D (36.8)	C (32.9)
SR 611 WB right	B (18.9)	B (19.3)
Driveway NB left/thru	C (29.0)	D (49.1)
Driveway NB right	C (21.4)	C (20.2)
Chipperfield Drive SB left/thru	F (1896.7)*	F (1497.9)*
Chipperfield Drive SB right	C (23.8)	C (24.5)
<i>Overall Intersection</i>	<i>F (372.3)*</i>	<i>F (260.3)*</i>

* Significantly higher delay compared to what is calculated by Synchro

**EXISTING PEAK HOUR LEVELS OF SERVICE
SIGNALIZED INTERSECTIONS – STROUDSBURG BOROUGH**

Intersection	Existing Year 2013 A.M. Peak Hour LOS/Delay (seconds)	Existing Year 2013 P.M. Peak Hour LOS/Delay (seconds)
Main Street and Dreher Avenue		
Main Street EB left	D (41.3)	D (43.5)
Main Street EB thru/right	E (69.2)	D (51.2)
Main Street WB left	E (71.5)	D (39.8)
Main Street WB thru	C (31.8)	C (32.5)
Main Street WB right	A (7.4)	A (8.5)
Dreher Avenue NB left	D (39.3)	D (48.8)
Dreher Avenue NB thru/right	C (26.9)	B (12.9)
School Driveway SB left	F (133.9)	F (134.5)
School Driveway SB thru/right	B (18.2)	C (24.2)
<i>Overall Intersection</i>	<i>D (47.6)</i>	<i>D (41.4)</i>
Main Street and 9th Street		
Main Street EB left/thru/right	C (20.3)	F (83.6)
Main Street WB left/thru	C (26.0)	C (32.4)
Main Street WB right	C (24.9)	C (28.3)
9 th Street NB left/thru/right	C (32.4)	D (42.4)
9 th Street SB left	E (66.7)	F (141.1)
9 th Street SB thru/right	C (27.0)	C (33.5)
<i>Overall Intersection</i>	<i>C (31.4)</i>	<i>E (70.5)</i>
Main Street and 8th Street		
Main Street EB left/thru/right	B (16.2)	B (14.2)
Main Street WB left/thru/right	B (14.7)	B (13.2)
8 th Street NB left/thru/right	D (40.0)	C (34.4)
8 th Street SB left/thru/right	C (29.1)	C (29.4)
<i>Overall Intersection</i>	<i>C (20.1)</i>	<i>B (19.2)</i>

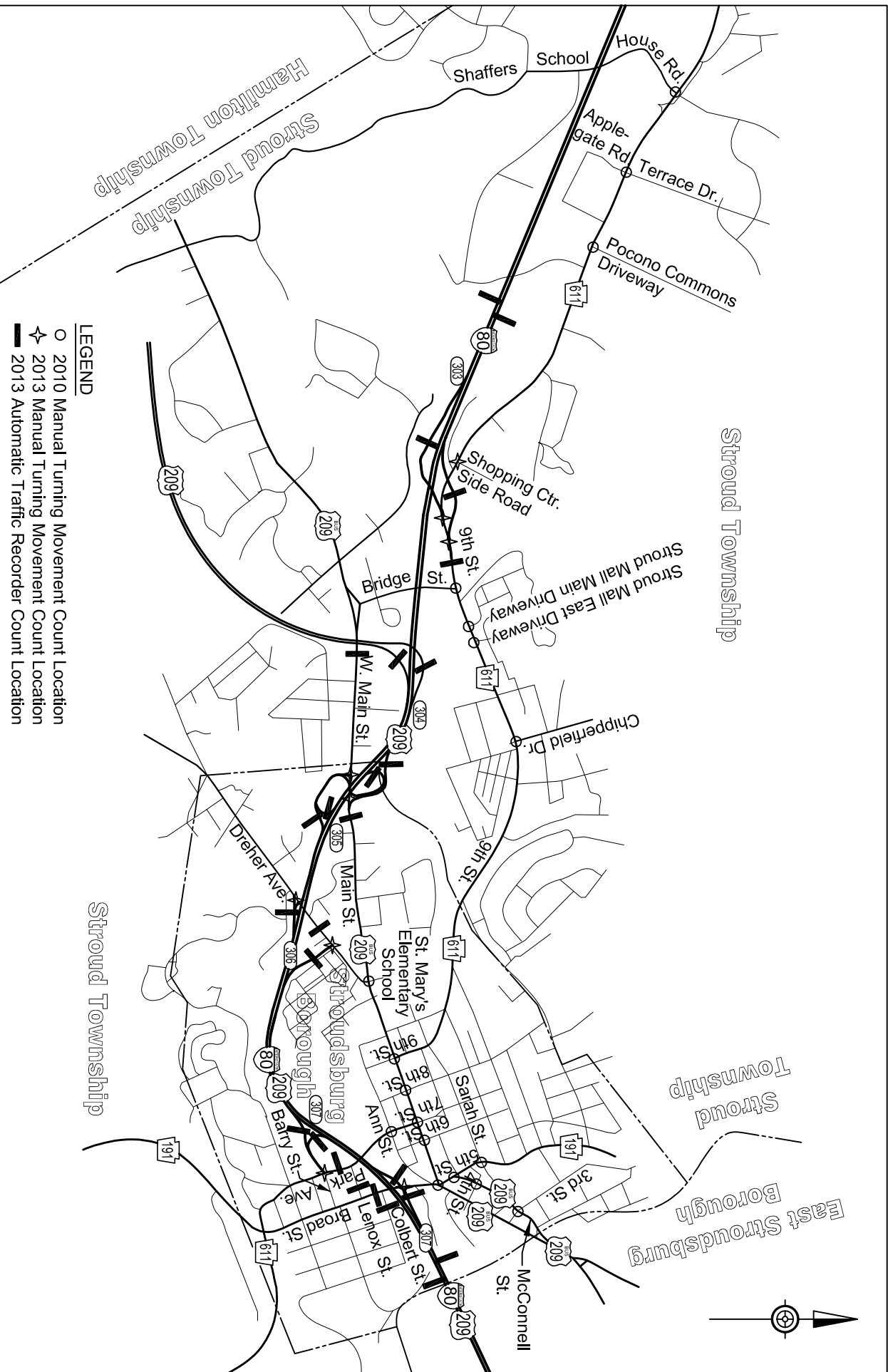
**EXISTING PEAK HOUR LEVELS OF SERVICE
SIGNALIZED INTERSECTIONS – STROUDSBURG BOROUGH (continued)**

Intersection	Existing Year 2013 A.M. Peak Hour LOS/Delay (seconds)	Existing Year 2013 P.M. Peak Hour LOS/Delay (seconds)
Main Street and 7th Street		
Main Street EB left/thru/right	B (12.9)	B (14.4)
Main Street WB left/thru/right	A (10.0)	B (18.1)
7 th Street NB left/thru/right	D (48.7)	E (62.3)
7 th Street SB left/thru/right	E (62.9)	E (75.4)
<i>Overall Intersection</i>	<i>C (26.1)</i>	<i>C (32.7)</i>
7th Street and Ann Street		
Ann Street WB left/thru/right	A (8.7)	B (17.4)
7 th Street NB left/thru	B (12.8)	C (29.8)
7 th Street SB thru/right	A (4.9)	A (4.7)
<i>Overall Intersection</i>	<i>A (9.3)</i>	<i>B (15.9)</i>
Main Street and 6th Street		
Main Street EB left/thru/right	B (12.4)	A (9.6)
Main Street WB left/thru/right	B (11.3)	B (15.9)
6 th Street NB left/thru/right	E (60.4)	E (74.2)
<i>Overall Intersection</i>	<i>B (19.0)</i>	<i>C (23.2)</i>
Main Street and 5th Street/Broad Street		
Main Street EB thru/right	D (43.6)	D (45.2)
Broad Street NB left	C (21.2)	C (27.9)
Broad Street NB right	C (32.8)	D (36.8)
5 th Street SB left	B (12.1)	B (15.0)
5 th Street SB thru	C (30.7)	D (38.2)
5 th Street SB right	A (4.1)	A (1.8)
<i>Overall Intersection</i>	<i>C (27.4)</i>	<i>C (31.7)</i>

**EXISTING PEAK HOUR LEVELS OF SERVICE
SIGNALIZED INTERSECTIONS – STROUDSBURG BOROUGH (continued)**

Intersection	Existing Year 2013 A.M. Peak Hour LOS/Delay (seconds)	Existing Year 2013 P.M. Peak Hour LOS/Delay (seconds)
McConnell Street and 4th Street		
4 th Street EB thru/right	B (18.8)	D (53.3)
4 th Street WB left/thru	C (21.6)	F (86.1)
McConnell Street SB left/thru	A (3.7)	A (8.0)
McConnell Street SB thru	A (3.6)	A (7.5)
<i>Overall Intersection</i>	<i>A (6.9)</i>	<i>C (22.0)</i>
McConnell Street and 3rd Street		
3 rd Street EB thru/right	B (17.7)	C (26.1)
3 rd Street WB left/thru	B (16.6)	C (24.0)
McConnell Street SB left/thru	A (4.8)	A (6.1)
McConnell Street SB thru	A (4.5)	A (5.7)
McConnell Street SB right	A (3.2)	A (4.1)
<i>Overall Intersection</i>	<i>A (7.4)</i>	<i>B (10.5)</i>
5th Street and Sarah Street		
Sarah Street EB left/thru/right	A (7.6)	B (12.9)
Sarah Street WB left/thru	B (13.9)	B (10.2)
Sarah Street WB right	A (3.2)	A (2.5)
5 th Street NB left/thru/right	B (10.9)	B (19.4)
5 th Street SB left/thru/right	B (16.4)	C (23.6)
<i>Overall Intersection</i>	<i>B (12.3)</i>	<i>B (14.6)</i>

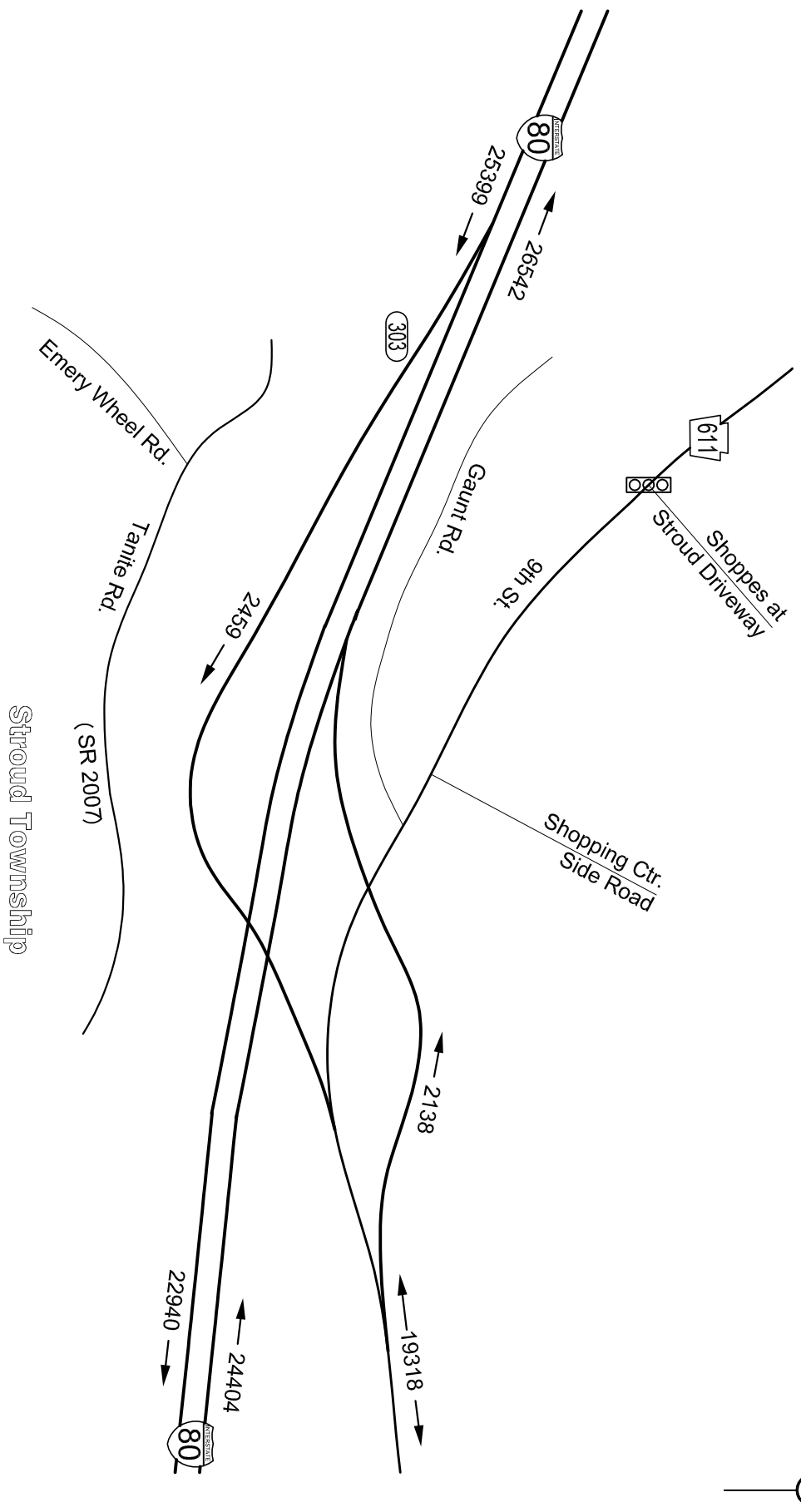
2045 TRAFFIC VOLUME MAPS



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FIGURE 1
STUDY AREA



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FIGURE 2
 ANNUAL AVERAGE
 DAILY TRAFFIC VOLUMES

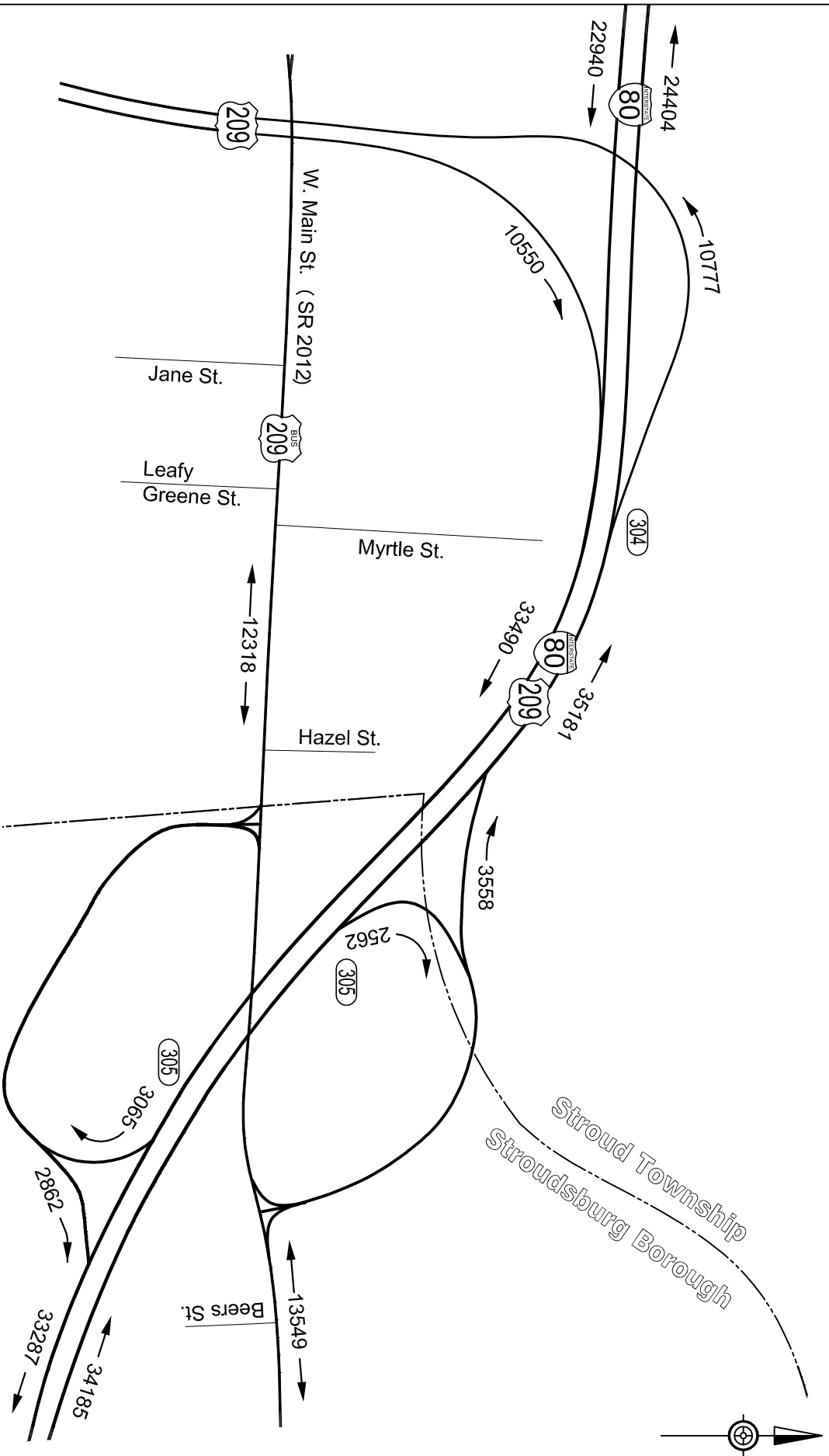


FIGURE 3
ANNUAL AVERAGE
DAILY TRAFFIC VOLUMES

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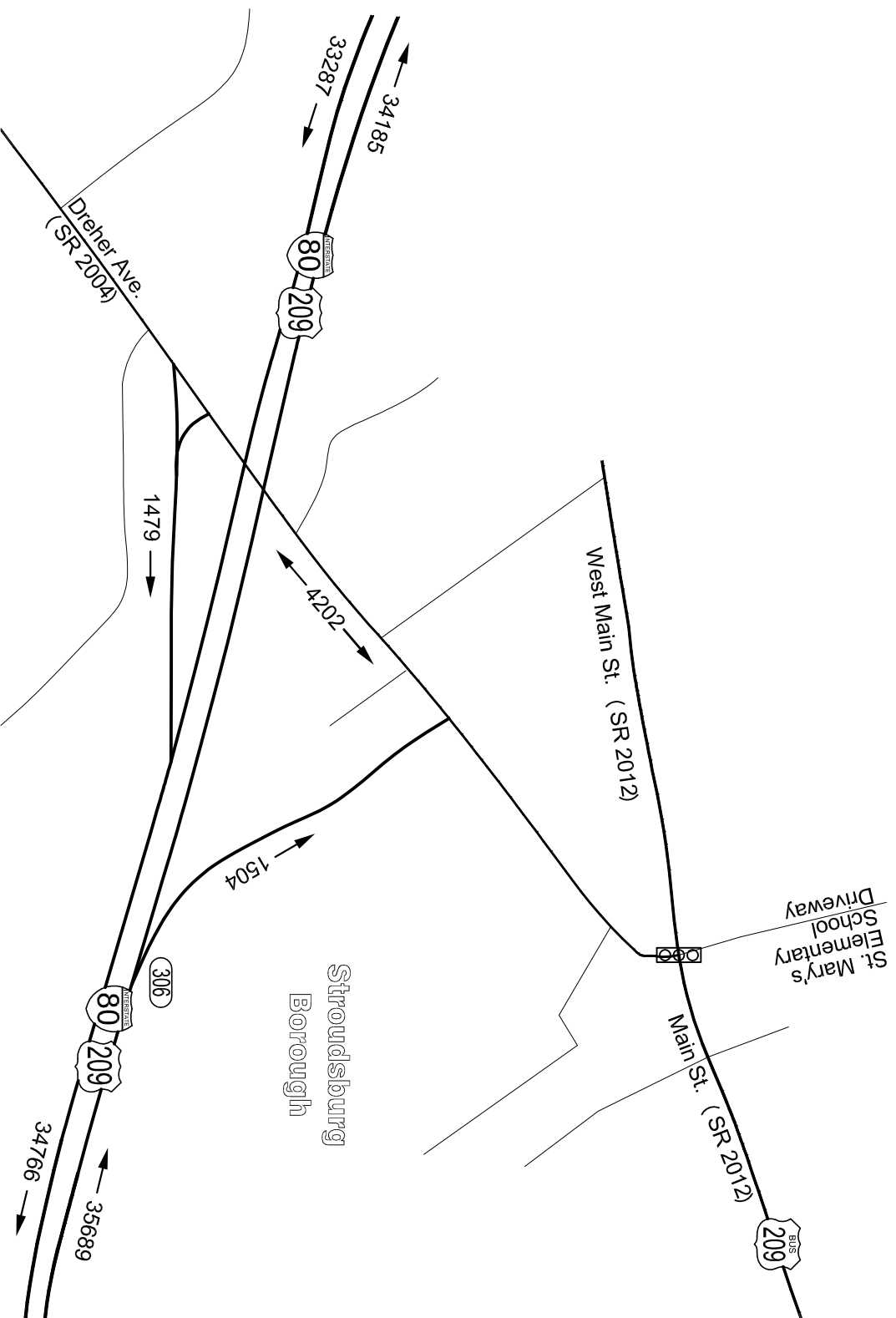


FIGURE 4
ANNUAL AVERAGE
DAILY TRAFFIC VOLUMES

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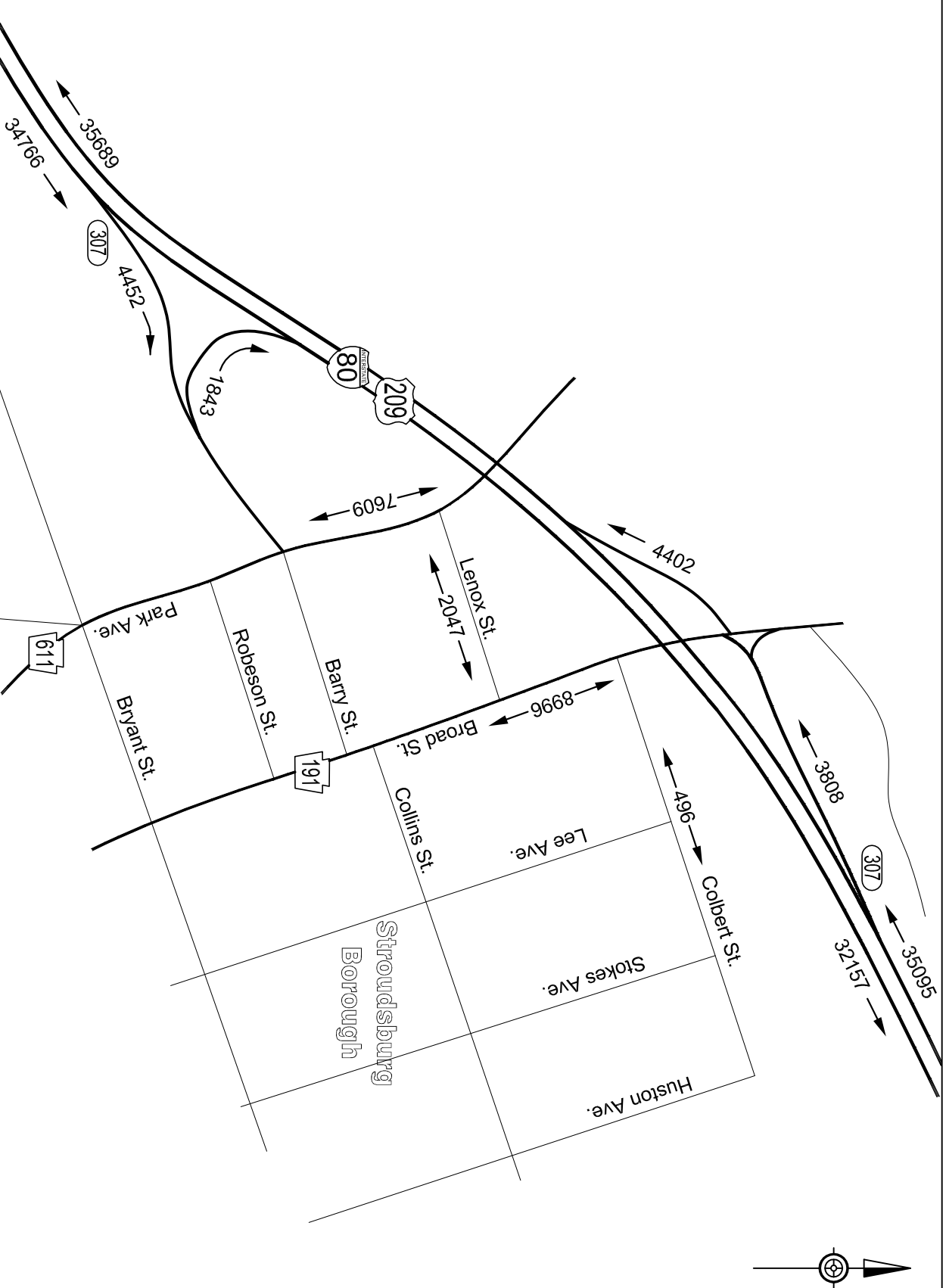
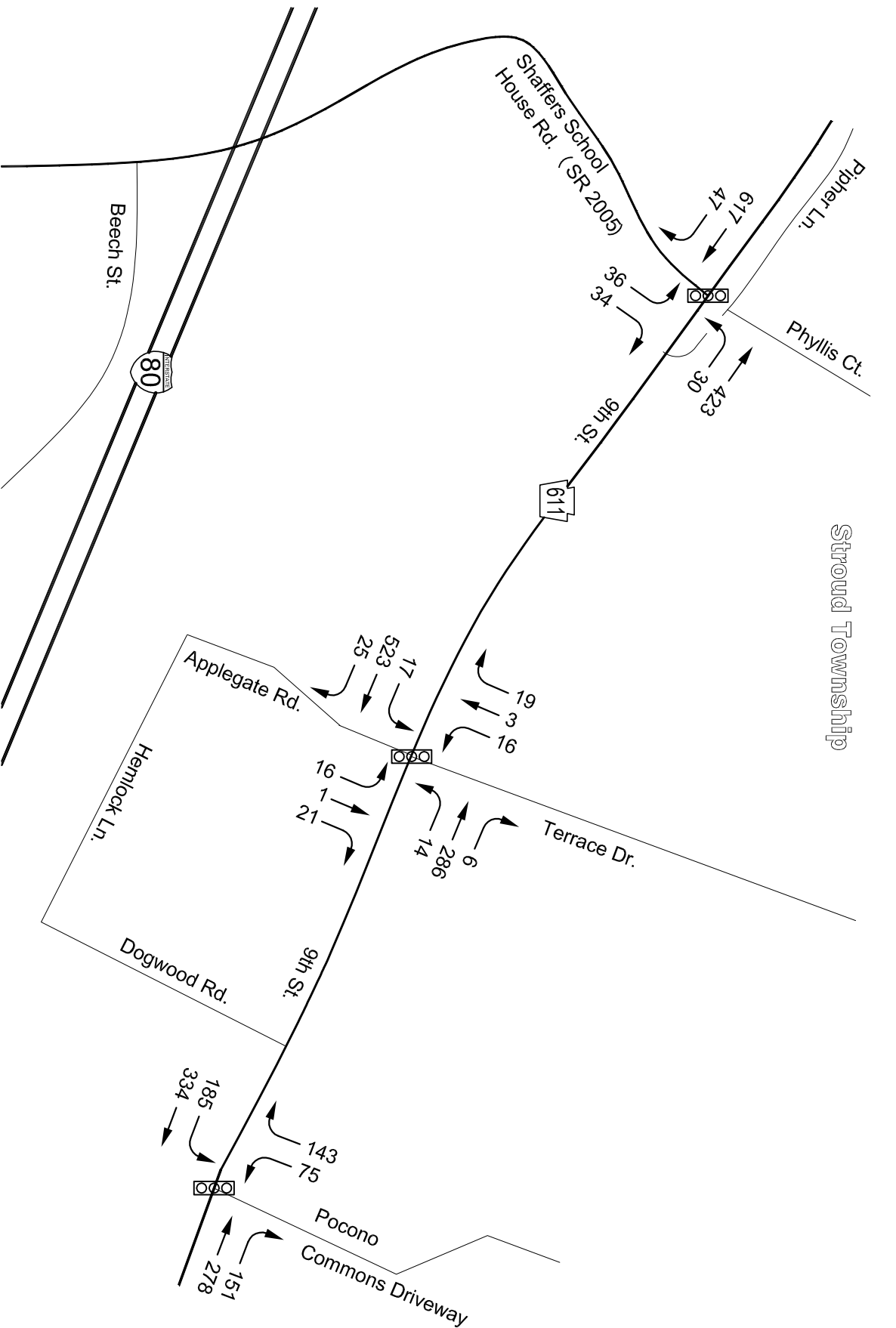


FIGURE 5
ANNUAL AVERAGE
DAILY TRAFFIC VOLUMES

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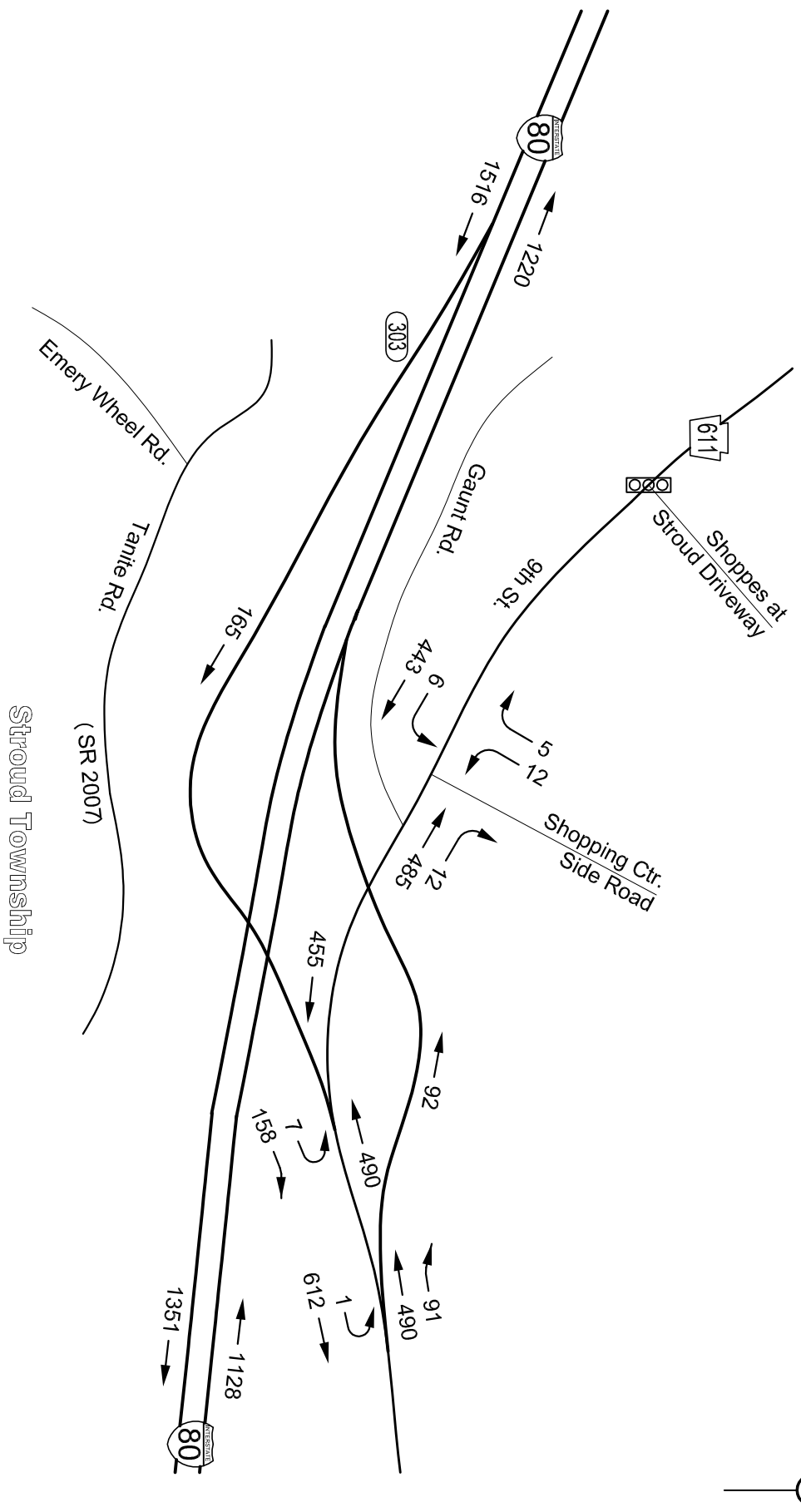
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FIGURE 6
A.M. PEAK HOUR
TRAFFIC VOLUMES

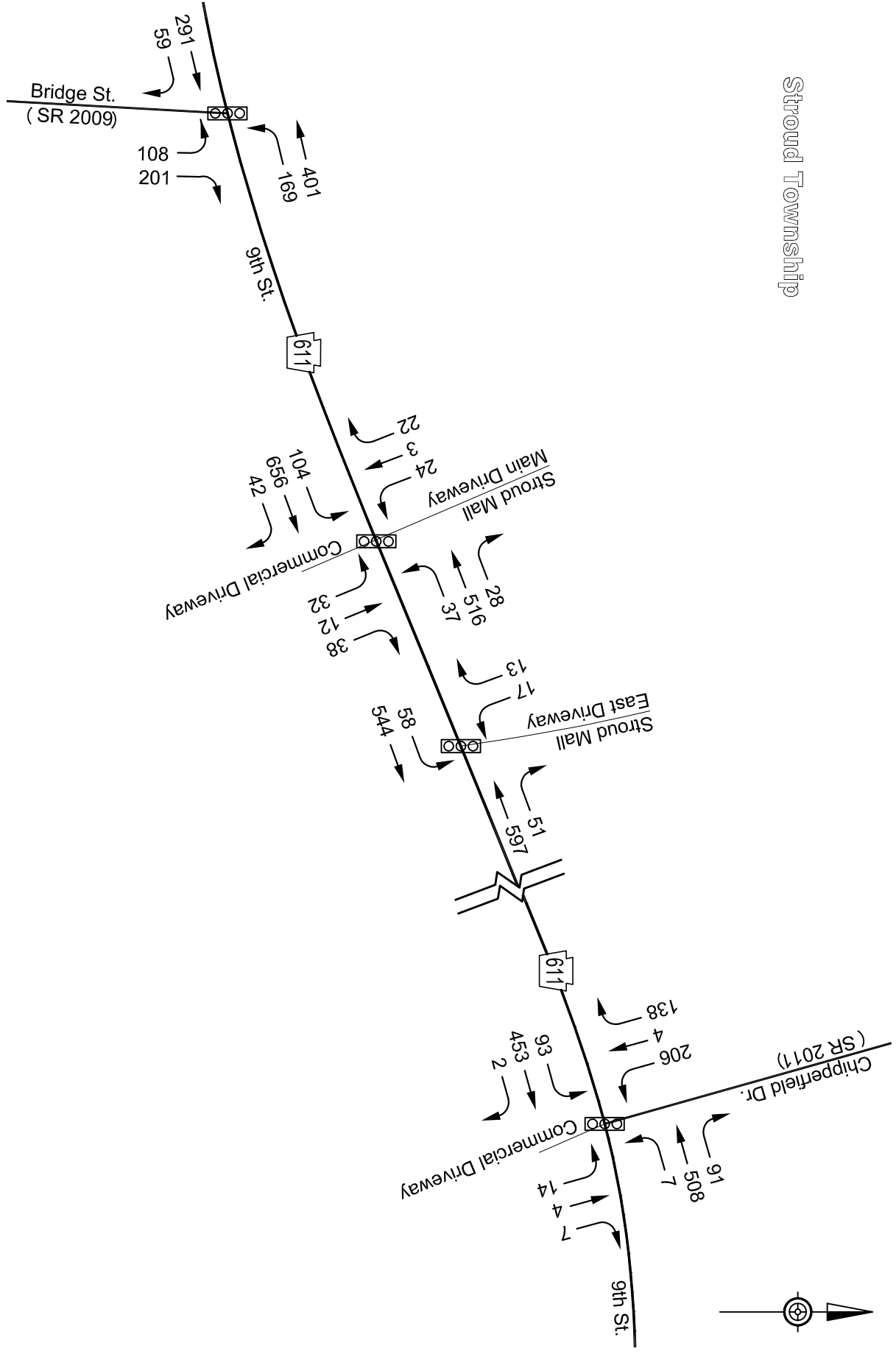


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FIGURE 7
 A.M. PEAK HOUR
 TRAFFIC VOLUMES

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FIGURE 8
A.M. PEAK HOUR
TRAFFIC VOLUMES

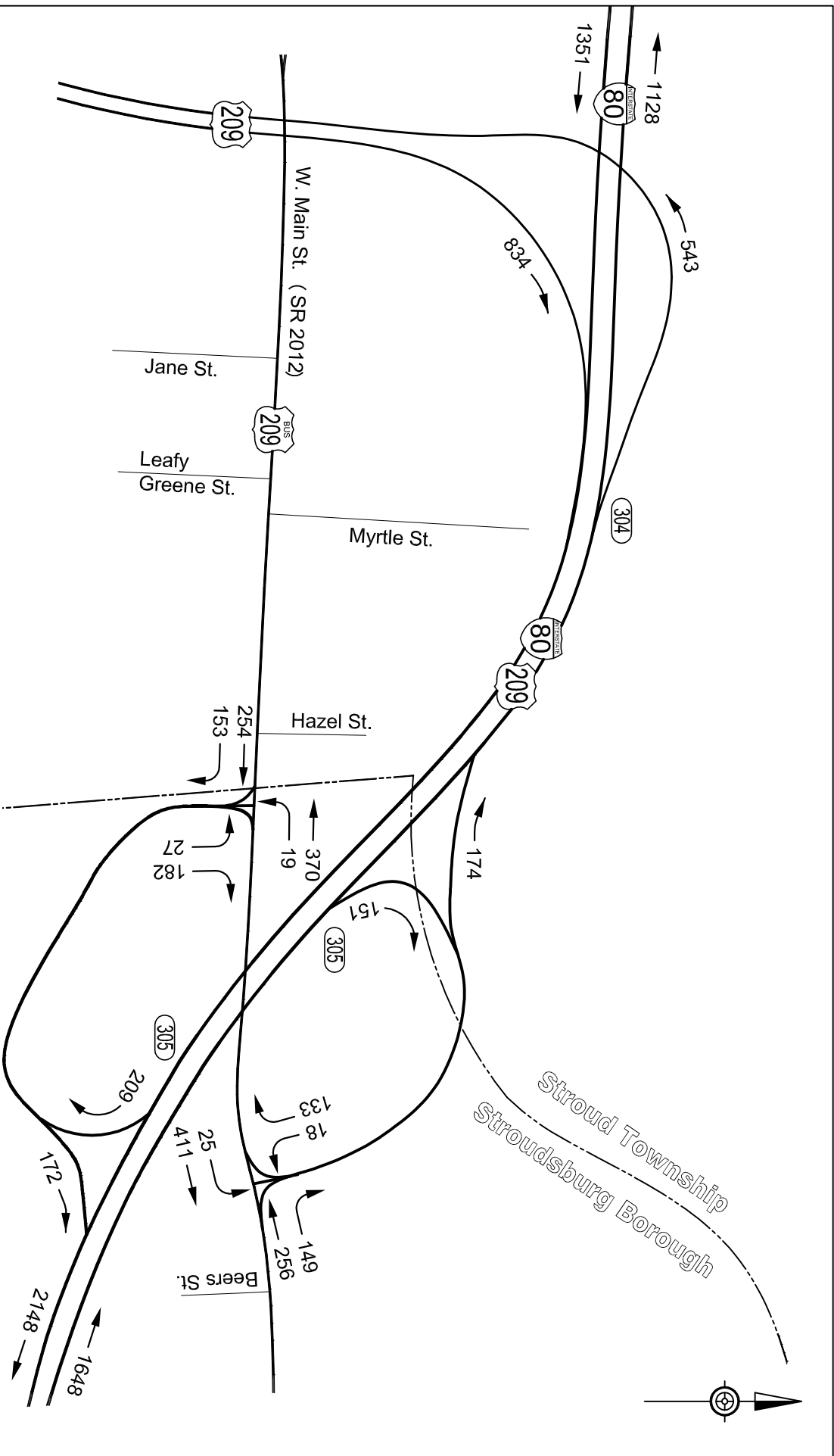
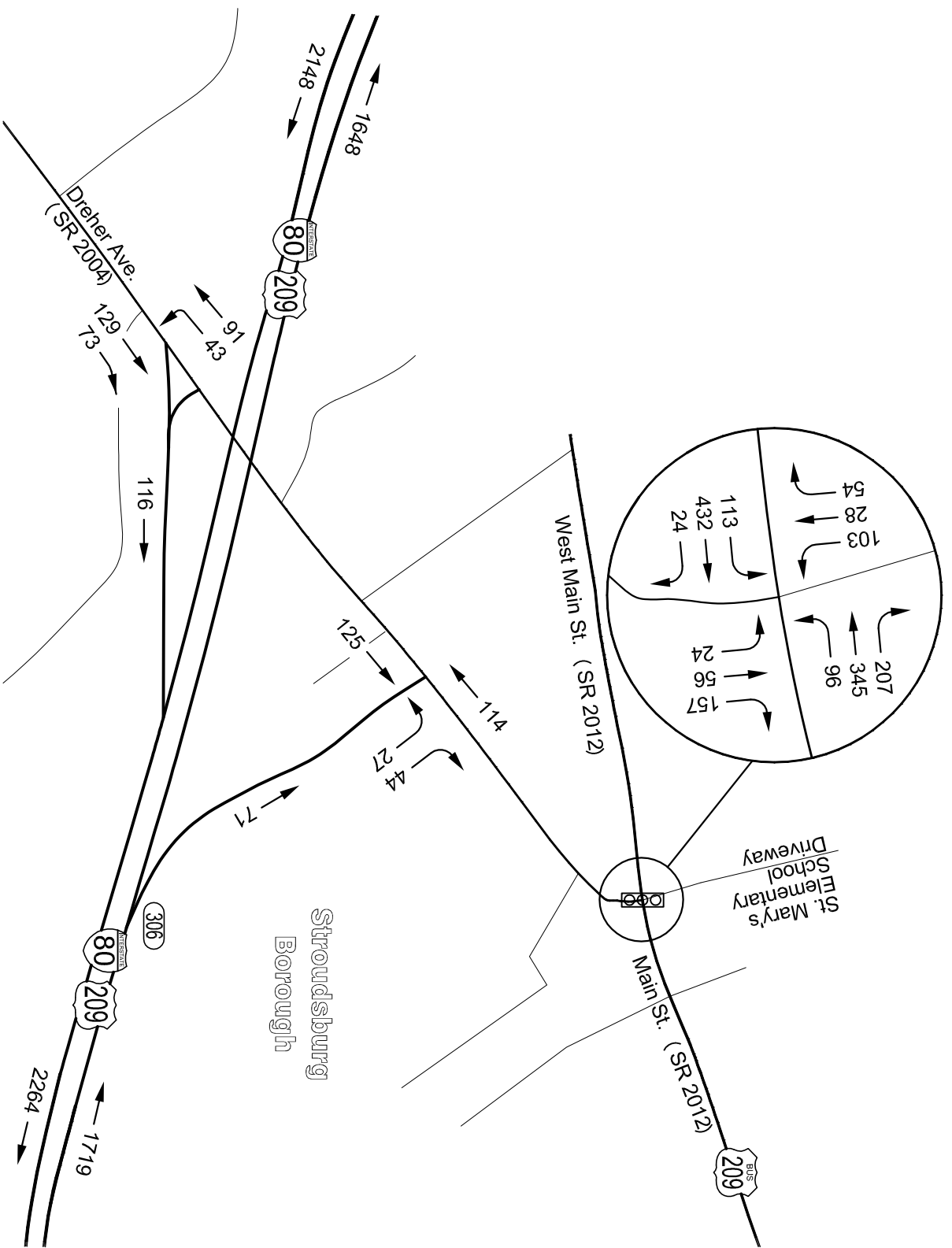


FIGURE 9
A.M. PEAK HOUR
TRAFFIC VOLUMES

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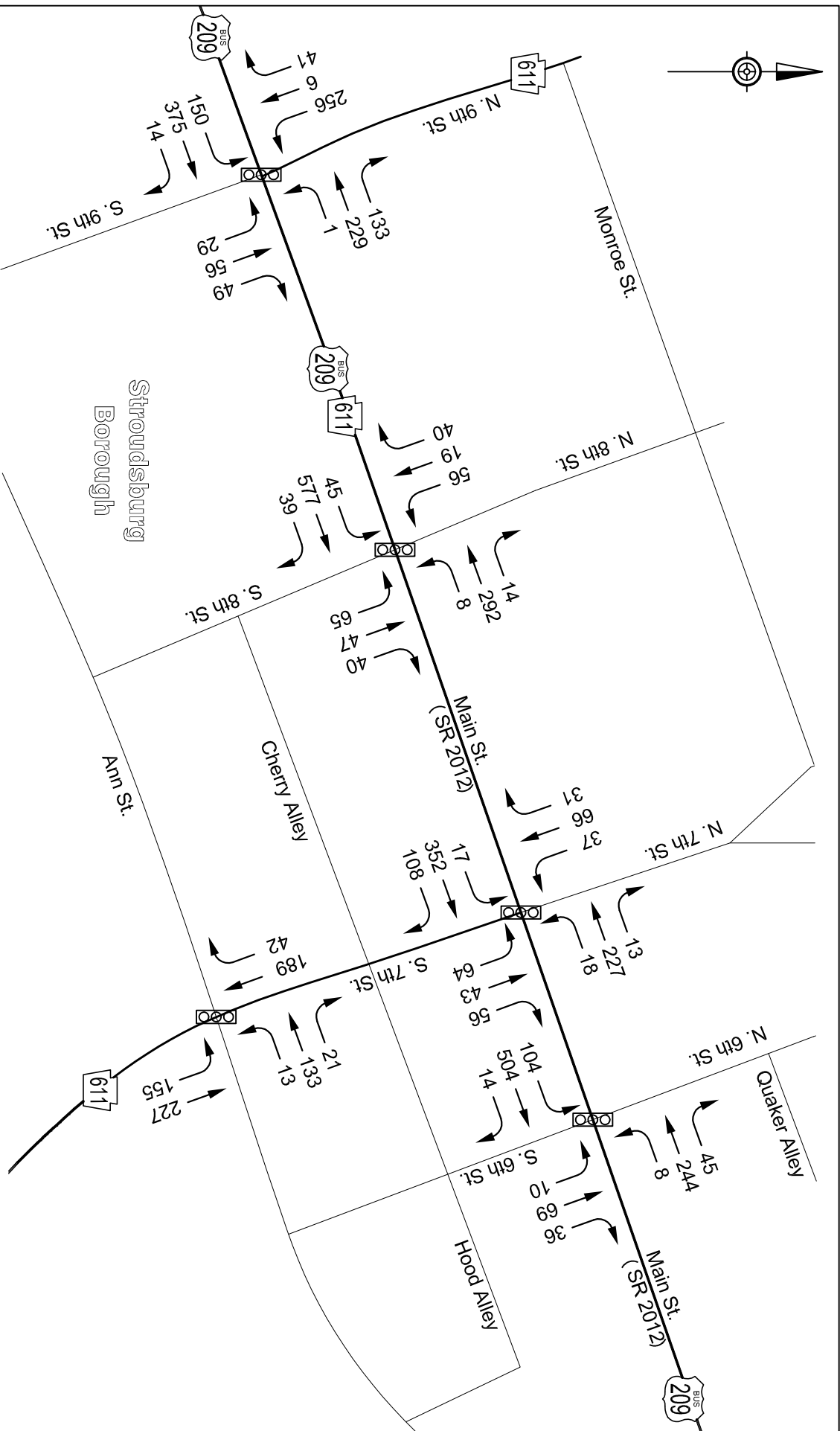
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FIGURE 10
A.M. PEAK HOUR
TRAFFIC VOLUMES



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FIGURE 11
A.M. PEAK HOUR
TRAFFIC VOLUMES

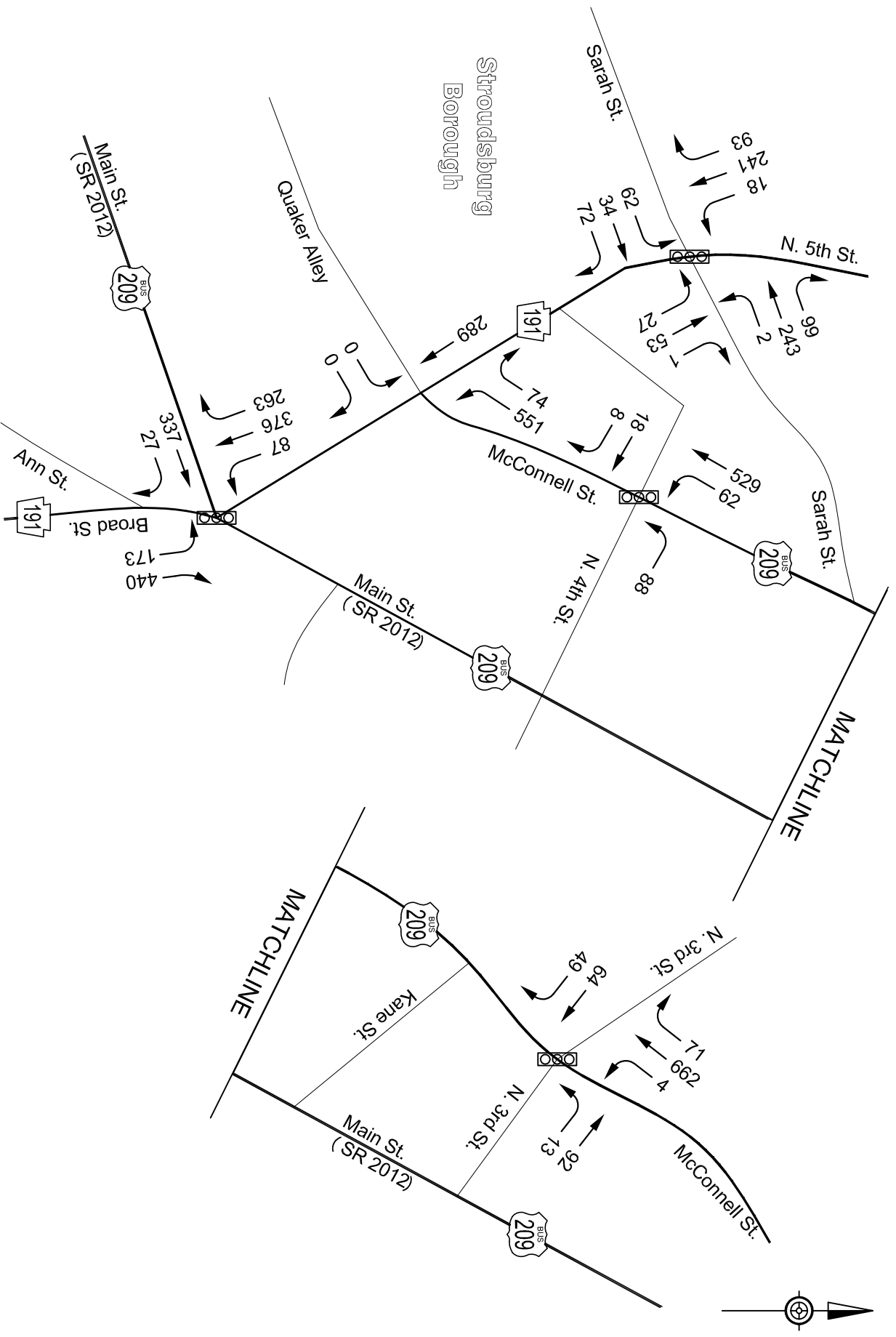
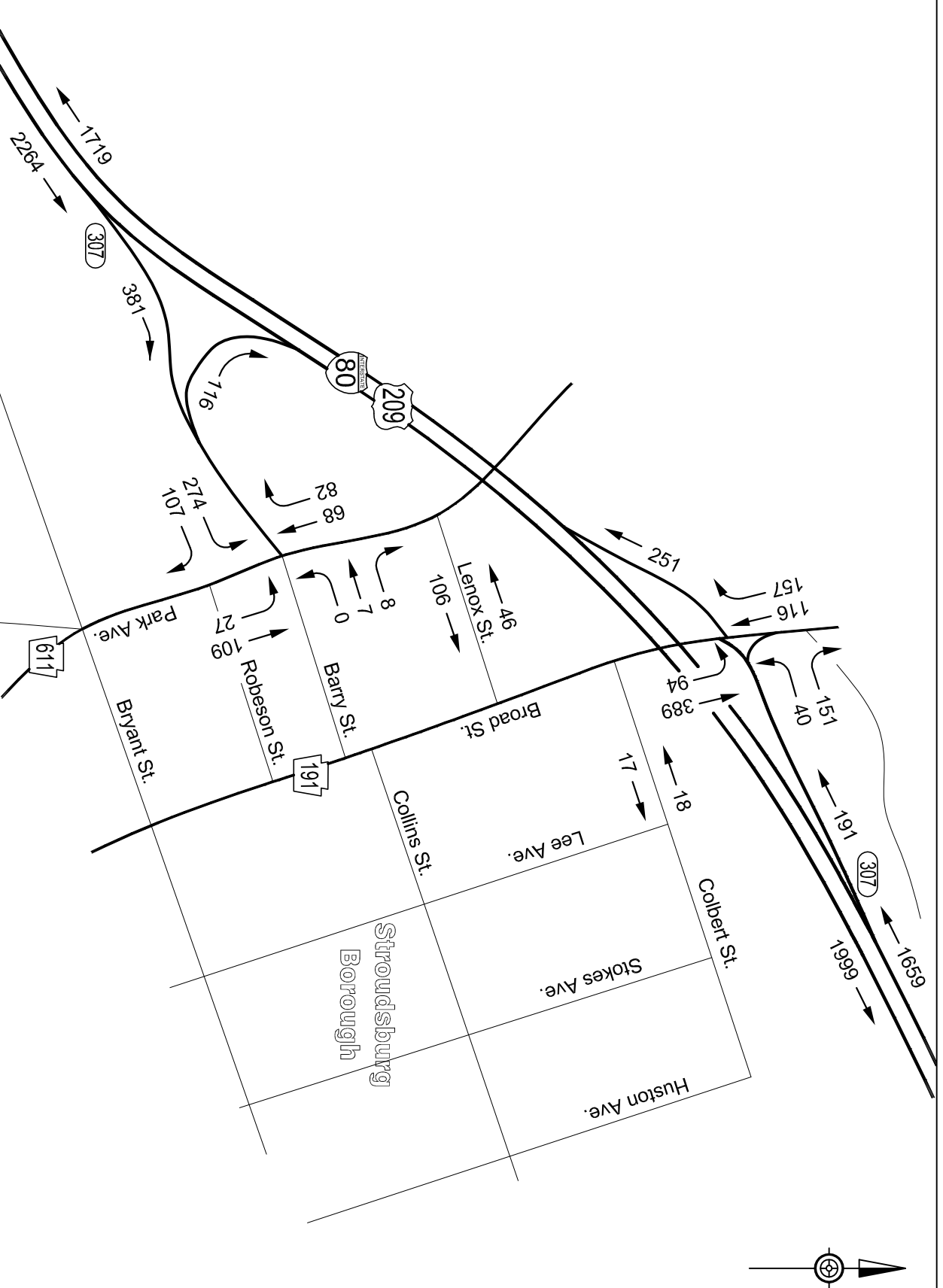


FIGURE 12
A.M. PEAK HOUR
TRAFFIC VOLUMES

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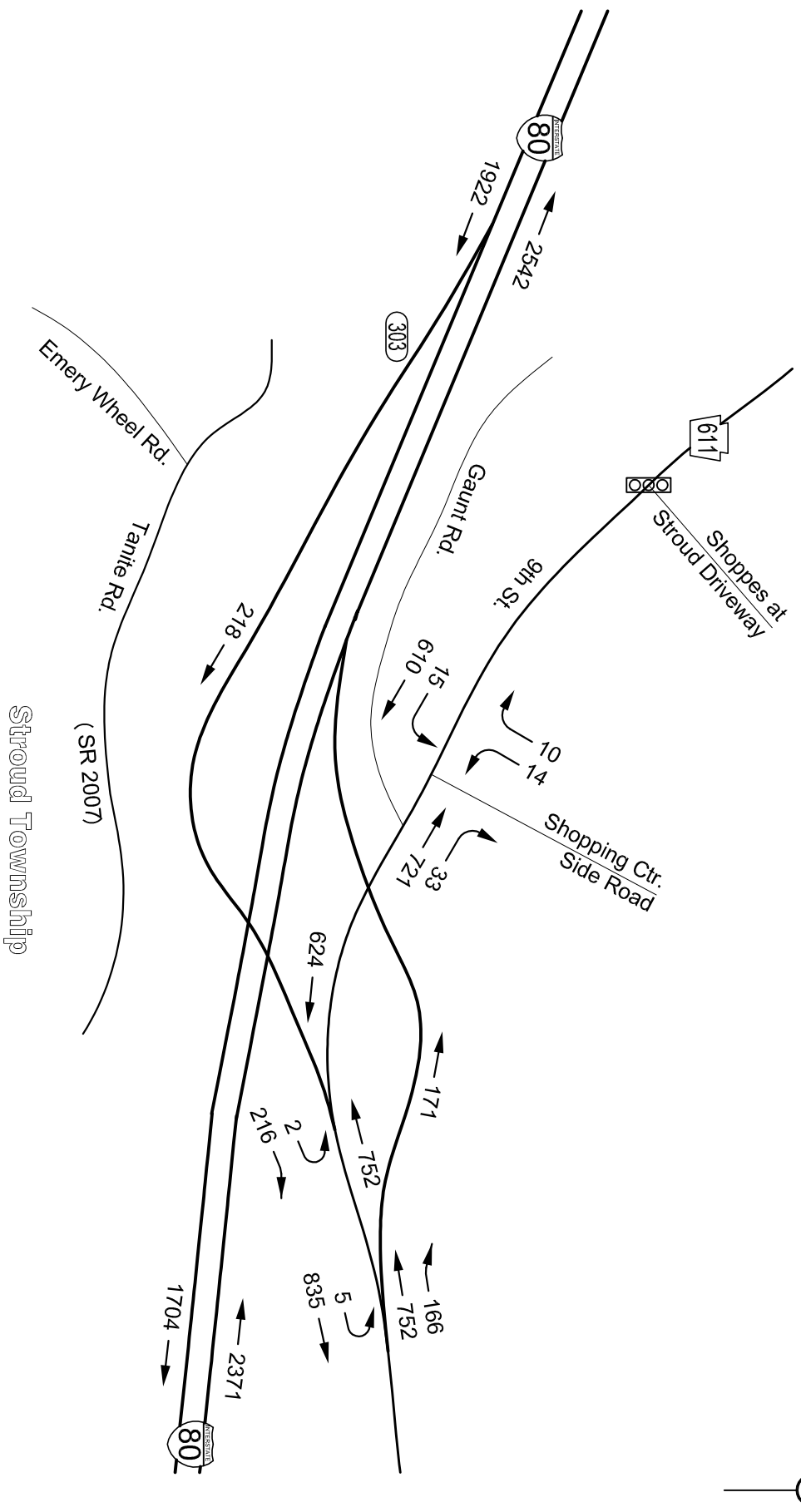


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FIGURE 13
A.M. PEAK HOUR
TRAFFIC VOLUMES

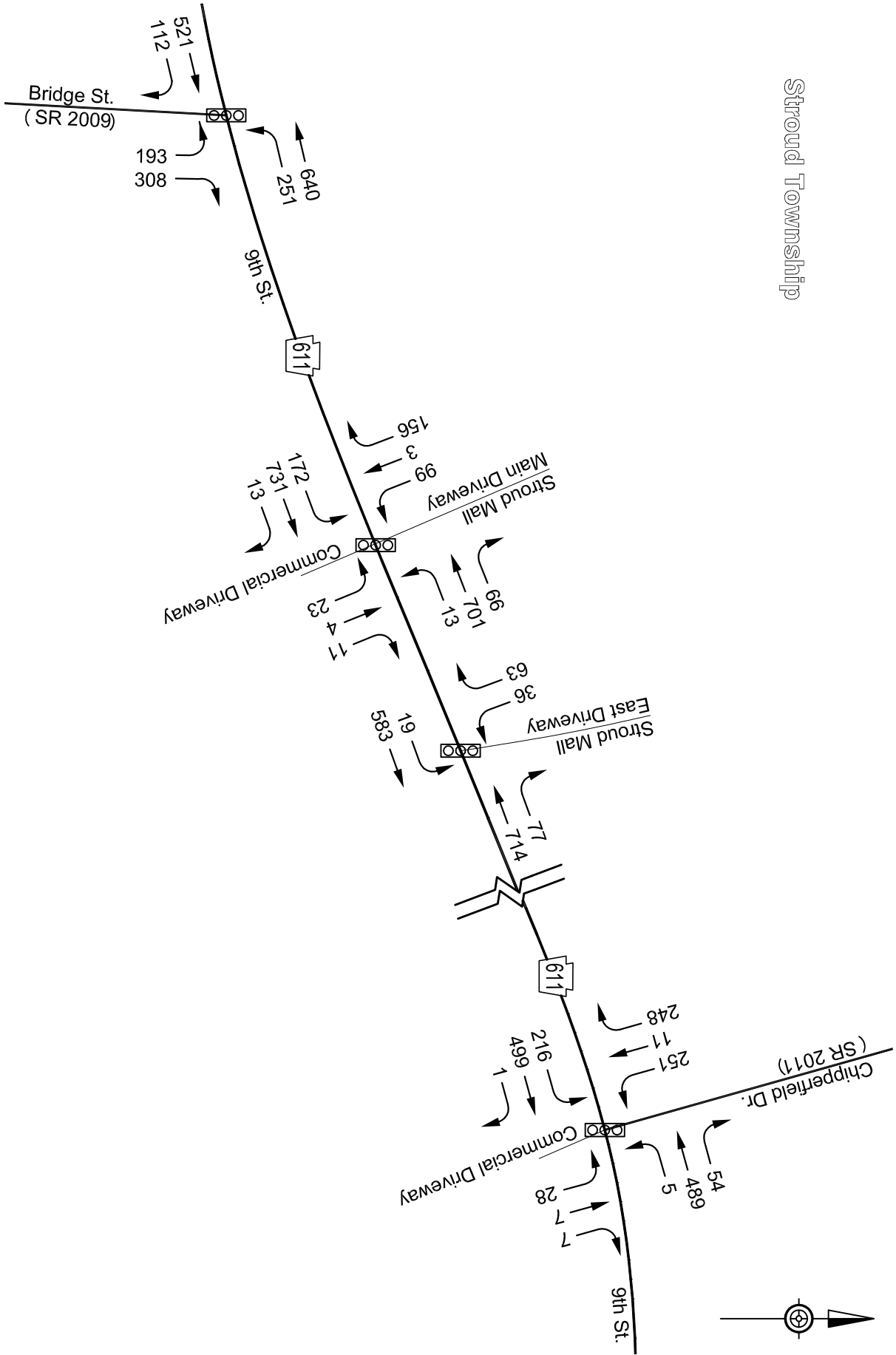


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FIGURE 15
P.M. PEAK HOUR
TRAFFIC VOLUMES

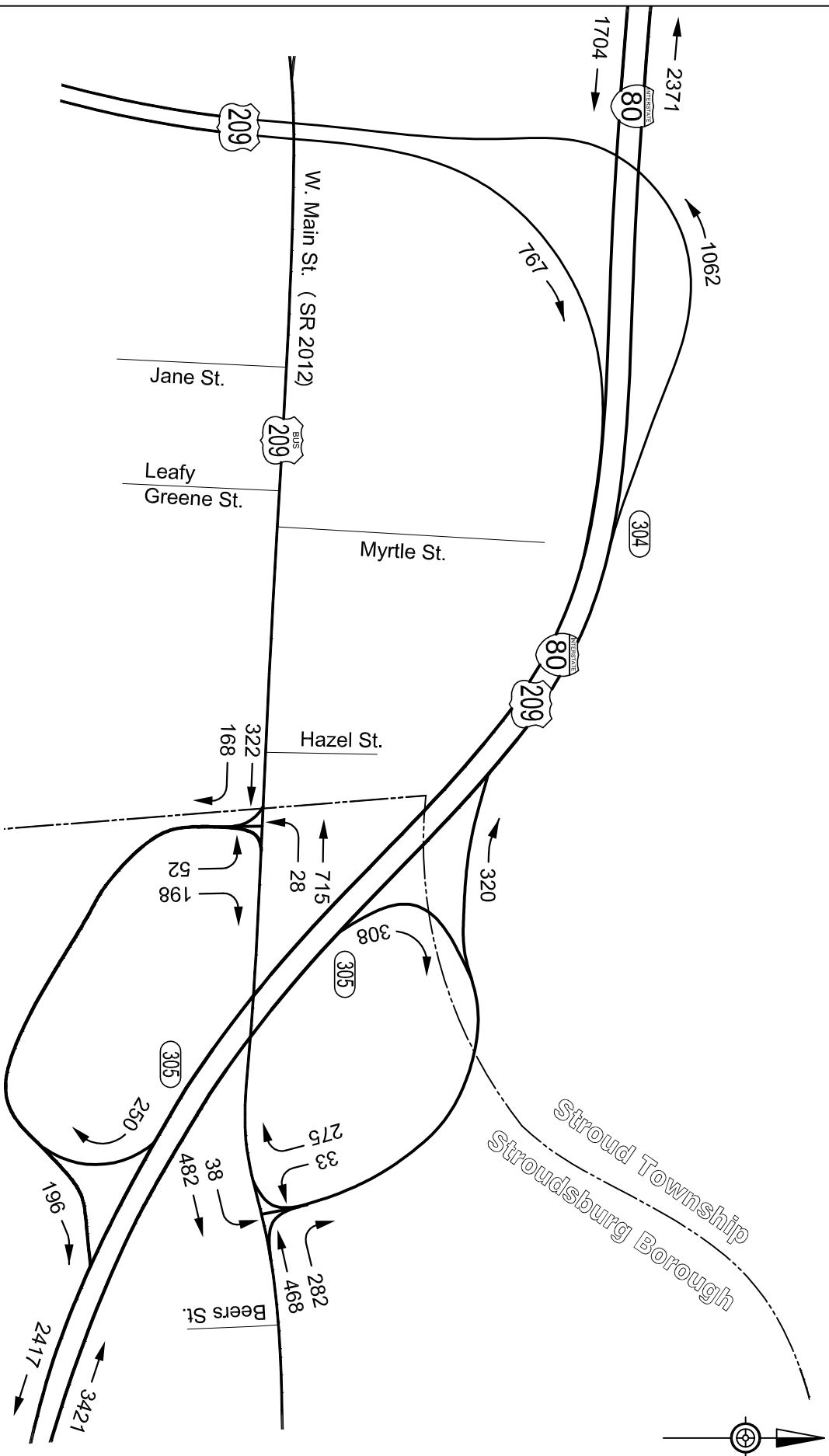
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FIGURE 16
P.M. PEAK HOUR
TRAFFIC VOLUMES

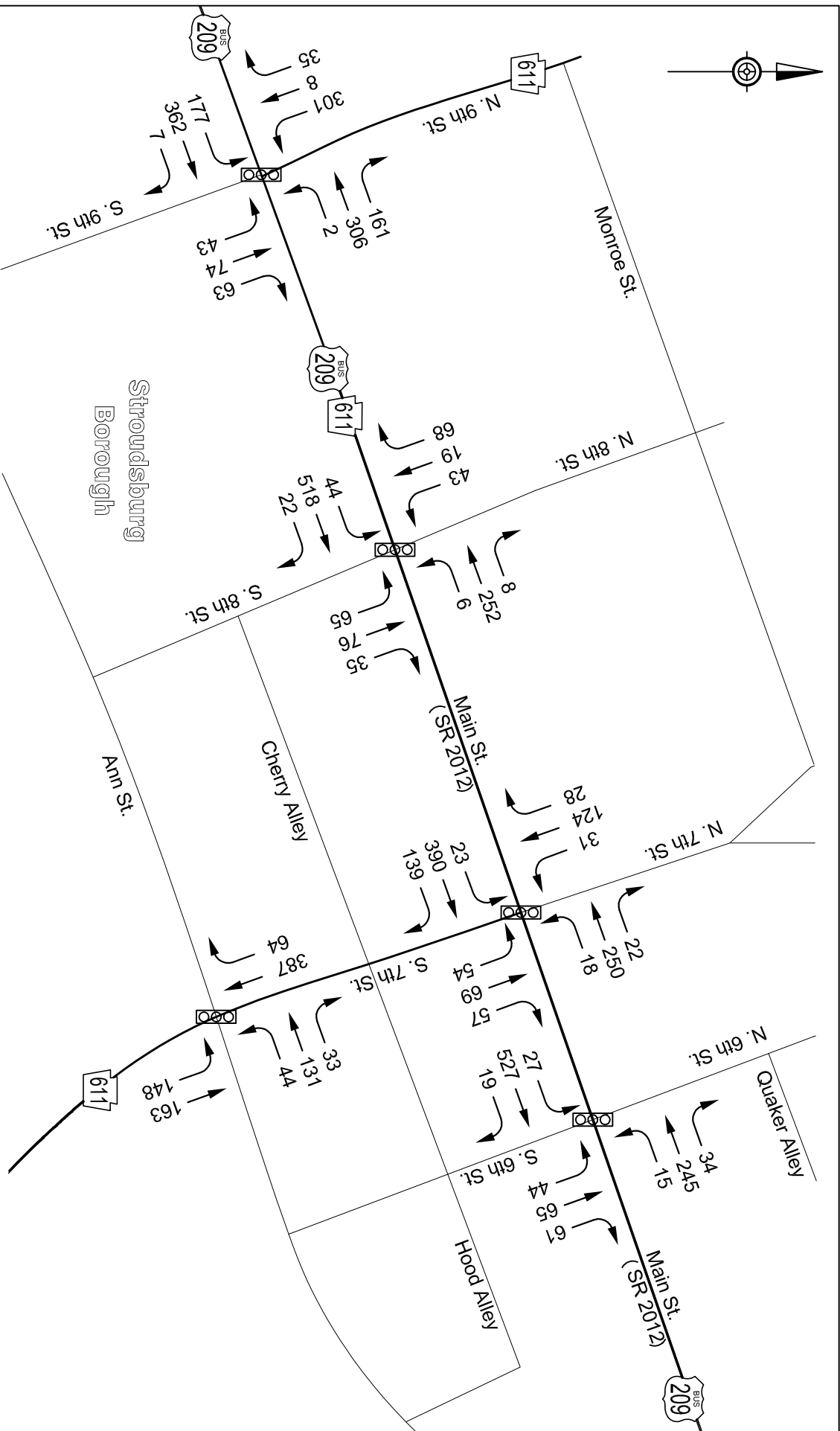


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FIGURE 17
P.M. PEAK HOUR
TRAFFIC VOLUMES



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FIGURE 19
P.M. PEAK HOUR
TRAFFIC VOLUMES

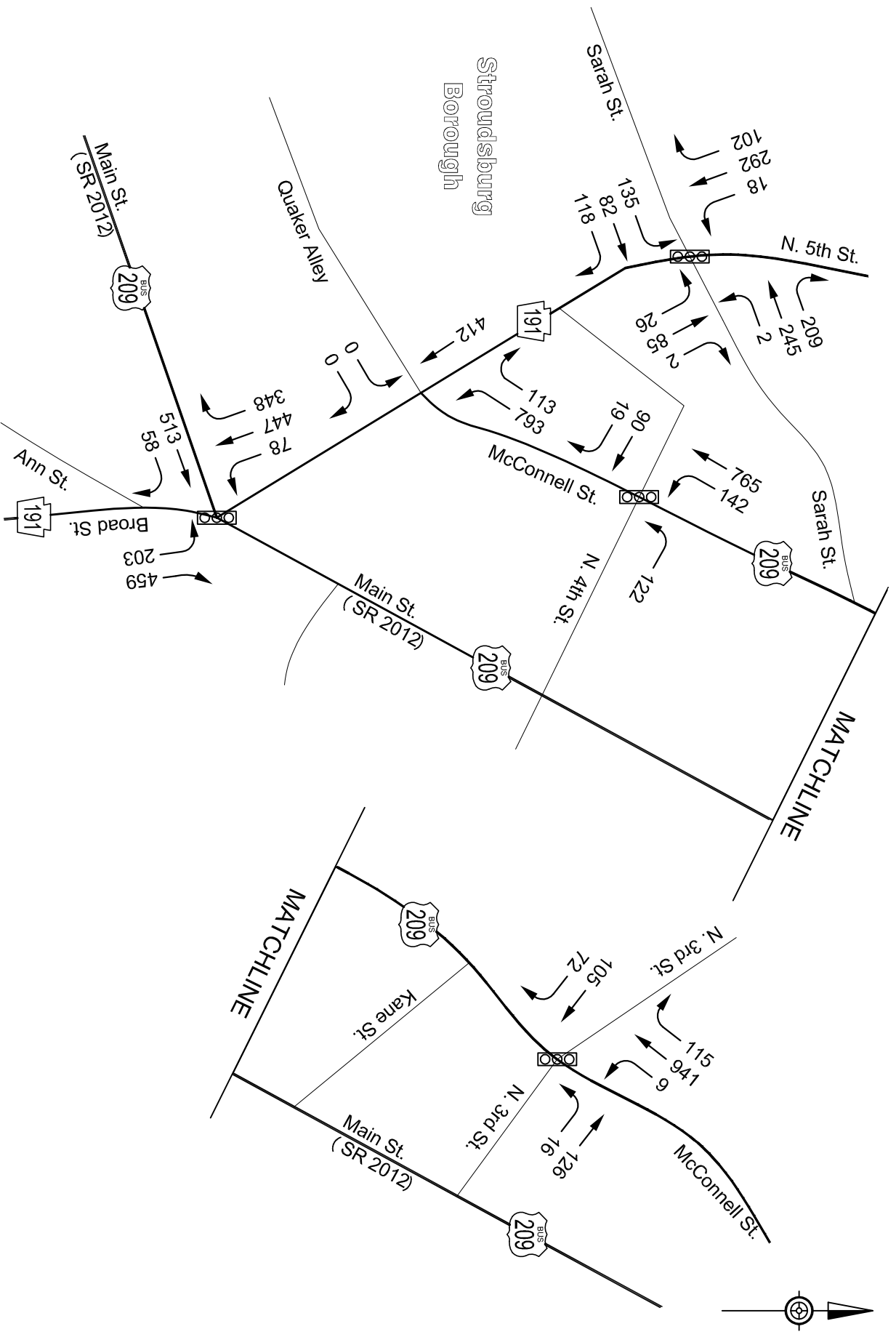


FIGURE 20
P.M. PEAK HOUR
TRAFFIC VOLUMES

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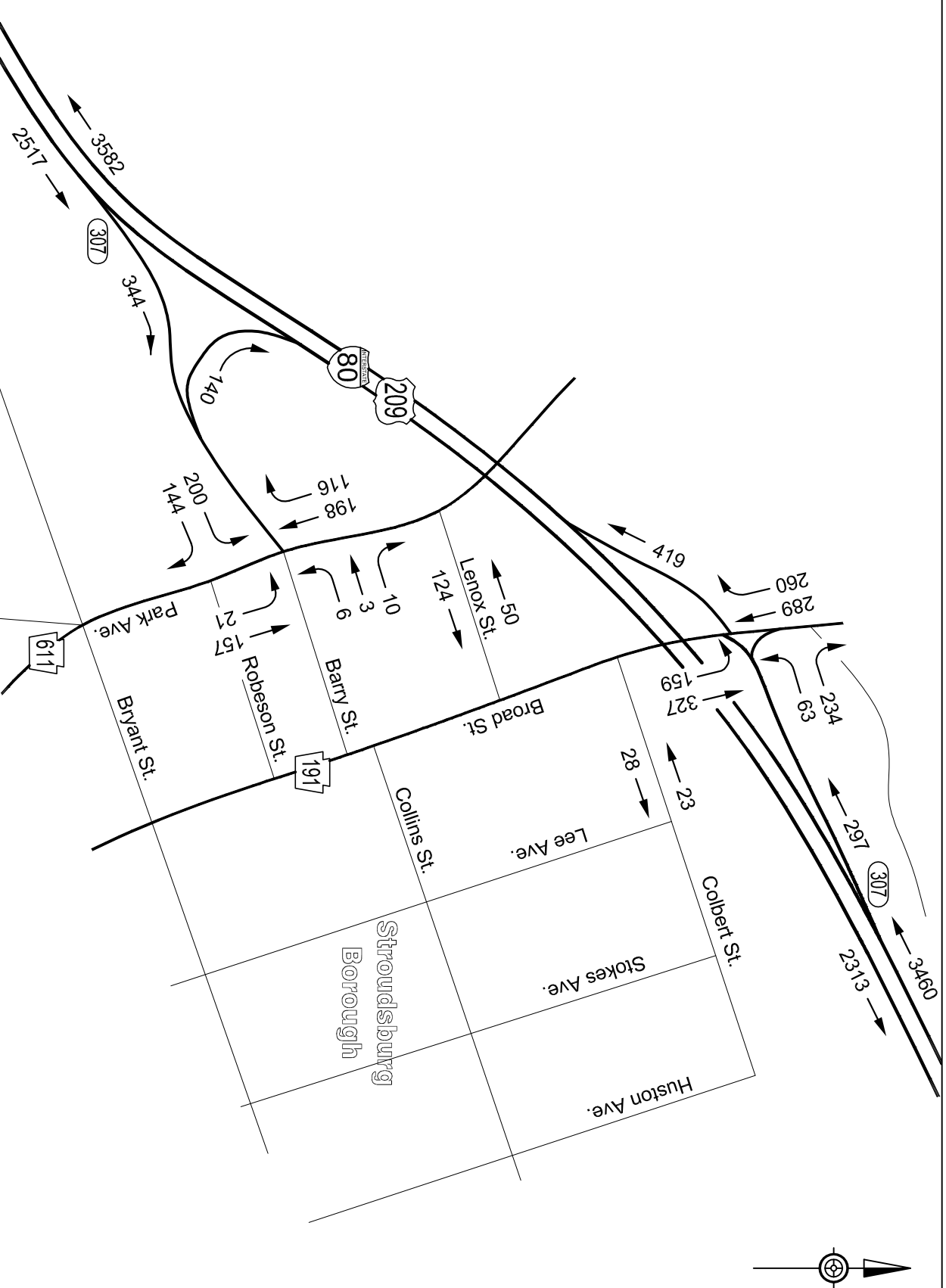


FIGURE 21
P.M. PEAK HOUR
TRAFFIC VOLUMES

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FREEWAY SEGMENT HCS ANALYSIS

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst *JMV*
 Agency or Company *L&V Engineering*
 Date Performed *6/20/2013*
 Analysis Time Period *A.M. Peak Hour*

Site Information

Highway/Direction of Travel *I-80 Eastbound*
 From/To *Between Ints. 303 and 304*
 Jurisdiction
 Analysis Year *Existing 2013*

Project Description *Interstate 80 Reconstruction*

☒ Oper.(LOS)

☐ Des.(N)

☐ Planning Data

Flow Inputs

Volume, V	<i>1351</i>	veh/h	Peak-Hour Factor, PHF	<i>0.94</i>
AADT		veh/day	%Trucks and Buses, P _T	<i>10</i>
Peak-Hr Prop. of AADT, K			%RVs, P _R	<i>1</i>
Peak-Hr Direction Prop, D			General Terrain:	<i>Rolling</i>
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>
			Up/Down %	

Calculate Flow Adjustments

f _p	<i>0.95</i>	E _R	<i>2.0</i>
E _T	<i>2.5</i>	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	<i>0.862</i>

Speed Inputs

Lane Width	<i>12.0</i>	ft
Rt-Side Lat. Clearance	<i>6.0</i>	ft
Number of Lanes, N	<i>2</i>	
Total Ramp Density, TRD	<i>1.67</i>	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	<i>75.4</i>	mph

Calc Speed Adj and FFS

f _{LW}	<i>0.0</i>	mph
f _{LC}	<i>0.0</i>	mph
TRD Adjustment	<i>5.0</i>	mph
FFS	<i>70.4</i>	mph

LOS and Performance Measures

Operational (LOS)

v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	<i>877</i>	pc/h/ln
S	<i>70.0</i>	mph
D = v _p / S	<i>12.5</i>	pc/mi/ln
LOS	<i>B</i>	

Design (N)

Design (N)

Design LOS	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
S	mph
D = v _p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v _p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
f _p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v _p - Exhibits 11-2, 11-3	

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst *JMV*
 Agency or Company *L&V Engineering*
 Date Performed *6/20/2013*
 Analysis Time Period *P.M. Peak Hour*

Site Information

Highway/Direction of Travel *I-80 Eastbound*
 From/To *Between Ints. 303 and 304*
 Jurisdiction
 Analysis Year *Existing 2013*

Project Description *Interstate 80 Reconstruction*

☒ Oper.(LOS)

☐ Des.(N)

☐ Planning Data

Flow Inputs

Volume, V	<i>1704</i>	veh/h	Peak-Hour Factor, PHF	<i>0.94</i>
AADT		veh/day	%Trucks and Buses, P _T	<i>12</i>
Peak-Hr Prop. of AADT, K			%RVs, P _R	<i>1</i>
Peak-Hr Direction Prop, D			General Terrain:	<i>Rolling</i>
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>
			Up/Down %	

Calculate Flow Adjustments

f _p	<i>0.95</i>	E _R	<i>2.0</i>
E _T	<i>2.5</i>	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	<i>0.840</i>

Speed Inputs

Lane Width	<i>12.0</i>	ft
Rt-Side Lat. Clearance	<i>6.0</i>	ft
Number of Lanes, N	<i>2</i>	
Total Ramp Density, TRD	<i>1.67</i>	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	<i>75.4</i>	mph

Calc Speed Adj and FFS

f _{LW}	<i>0.0</i>	mph
f _{LC}	<i>0.0</i>	mph
TRD Adjustment	<i>5.0</i>	mph
FFS	<i>70.4</i>	mph

LOS and Performance Measures

Operational (LOS)

$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	<i>1135</i>	pc/h/ln
S	<i>70.0</i>	mph
$D = v_p / S$	<i>16.2</i>	pc/mi/ln
LOS	<i>B</i>	

Design (N)

Design (N)

Design LOS	
$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	pc/h/ln
S	mph
$D = v_p / S$	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
 V - Hourly volume
 v_p - Flow rate
 LOS - Level of service
 DDHV - Directional design hour volume

S - Speed
 D - Density
 FFS - Free-flow speed
 BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
 E_T - Exhibits 11-10, 11-11, 11-13
 f_p - Page 11-18
 LOS, S, FFS, v_p - Exhibits 11-2, 11-3

f_{LW} - Exhibit 11-8
 f_{LC} - Exhibit 11-9
 TRD - Page 11-11

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst *JMV*
 Agency or Company *L&V Engineering*
 Date Performed *6/20/2013*
 Analysis Time Period *A.M. Peak Hour*

Site Information

Highway/Direction of Travel *I-80 Eastbound*
 From/To *Between Ints. 304 and 305*
 Jurisdiction
 Analysis Year *Existing 2013*

Project Description *Interstate 80 Reconstruction*

☒ Oper.(LOS)

☐ Des.(N)

☐ Planning Data

Flow Inputs

Volume, V	2185	veh/h	Peak-Hour Factor, PHF	0.91
AADT		veh/day	%Trucks and Buses, P _T	10
Peak-Hr Prop. of AADT, K			%RVs, P _R	1
Peak-Hr Direction Prop, D			General Terrain:	Rolling
DDHV = AADT x K x D		veh/h	Grade % Length	mi
			Up/Down %	

Calculate Flow Adjustments

f _p	0.95	E _R	2.0
E _T	2.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.862

Speed Inputs

Lane Width	12.0	ft
Rt-Side Lat. Clearance	6.0	ft
Number of Lanes, N	2	
Total Ramp Density, TRD	1.67	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	75.4	mph

Calc Speed Adj and FFS

f _{LW}	0.0	mph
f _{LC}	0.0	mph
TRD Adjustment	5.0	mph
FFS	70.4	mph

LOS and Performance Measures

Operational (LOS)

$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	1466	pc/h/ln
S	69.2	mph
$D = v_p / S$	21.2	pc/mi/ln
LOS	C	

Design (N)

Design (N)

Design LOS	
$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	pc/h/ln
S	mph
$D = v_p / S$	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v _p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
f _p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v _p - Exhibits 11-2, 11-3	

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst *JMV*
 Agency or Company *L&V Engineering*
 Date Performed *6/20/2013*
 Analysis Time Period *P.M. Peak Hour*

Site Information

Highway/Direction of Travel *I-80 Eastbound*
 From/To *Between Ints. 304 and 305*
 Jurisdiction
 Analysis Year *Existing 2013*

Project Description *Interstate 80 Reconstruction*

☒ Oper.(LOS)

☐ Des.(N)

☐ Planning Data

Flow Inputs

Volume, V	2471	veh/h	Peak-Hour Factor, PHF	0.95
AADT		veh/day	%Trucks and Buses, P _T	12
Peak-Hr Prop. of AADT, K			%RVs, P _R	1
Peak-Hr Direction Prop, D			General Terrain:	Rolling
DDHV = AADT x K x D		veh/h	Grade % Length	mi
			Up/Down %	

Calculate Flow Adjustments

f _p	0.95	E _R	2.0
E _T	2.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.840

Speed Inputs

Lane Width	12.0	ft
Rt-Side Lat. Clearance	6.0	ft
Number of Lanes, N	2	
Total Ramp Density, TRD	1.67	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	75.4	mph

Calc Speed Adj and FFS

f _{LW}	0.0	mph
f _{LC}	0.0	mph
TRD Adjustment	5.0	mph
FFS	70.4	mph

LOS and Performance Measures

Operational (LOS)

$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	1629	pc/h/ln
S	67.9	mph
$D = v_p / S$	24.0	pc/mi/ln
LOS	C	

Design (N)

Design (N)

Design LOS	
$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	pc/h/ln
S	mph
$D = v_p / S$	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes S - Speed
 V - Hourly volume D - Density
 v_p - Flow rate FFS - Free-flow speed
 LOS - Level of service BFFS - Base free-flow speed
 DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12 f_{LW} - Exhibit 11-8
 E_T - Exhibits 11-10, 11-11, 11-13 f_{LC} - Exhibit 11-9
 f_p - Page 11-18 TRD - Page 11-11
 LOS, S, FFS, v_p - Exhibits 11-2, 11-3

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst *JMV*
 Agency or Company *L&V Engineering*
 Date Performed *6/20/2013*
 Analysis Time Period *A.M. Peak Hour*

Site Information

Highway/Direction of Travel *I-80 Eastbound*
 From/To *Between Ints. 305 and 306*
 Jurisdiction
 Analysis Year *Existing 2013*

Project Description *Interstate 80 Reconstruction*

☒ Oper.(LOS)

☐ Des.(N)

☐ Planning Data

Flow Inputs

Volume, V	2148	veh/h	Peak-Hour Factor, PHF	0.87
AADT		veh/day	%Trucks and Buses, P _T	10
Peak-Hr Prop. of AADT, K			%RVs, P _R	1
Peak-Hr Direction Prop, D			General Terrain:	Rolling
DDHV = AADT x K x D		veh/h	Grade % Length	mi
			Up/Down %	

Calculate Flow Adjustments

f _p	0.95	E _R	2.0
E _T	2.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.862

Speed Inputs

Lane Width	12.0	ft
Rt-Side Lat. Clearance	6.0	ft
Number of Lanes, N	2	
Total Ramp Density, TRD	1.50	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	75.4	mph

Calc Speed Adj and FFS

f _{LW}	0.0	mph
f _{LC}	0.0	mph
TRD Adjustment	4.5	mph
FFS	70.9	mph

LOS and Performance Measures

Operational (LOS)

$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	1507	pc/h/ln
S	68.9	mph
$D = v_p / S$	21.9	pc/mi/ln
LOS	C	

Design (N)

Design (N)

Design LOS	
$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	pc/h/ln
S	mph
$D = v_p / S$	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v _p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
f _p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v _p - Exhibits 11-2, 11-3	

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst *JMV*
 Agency or Company *L&V Engineering*
 Date Performed *6/20/2013*
 Analysis Time Period *P.M. Peak Hour*

Site Information

Highway/Direction of Travel *I-80 Eastbound*
 From/To *Between Ints. 305 and 306*
 Jurisdiction
 Analysis Year *Existing 2013*

Project Description *Interstate 80 Reconstruction*

☒ Oper.(LOS)

☐ Des.(N)

☐ Planning Data

Flow Inputs

Volume, V	2417	veh/h	Peak-Hour Factor, PHF	0.96
AADT		veh/day	%Trucks and Buses, P _T	12
Peak-Hr Prop. of AADT, K			%RVs, P _R	1
Peak-Hr Direction Prop, D			General Terrain:	Rolling
DDHV = AADT x K x D		veh/h	Grade % Length	mi
			Up/Down %	

Calculate Flow Adjustments

f _p	0.95	E _R	2.0
E _T	2.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.840

Speed Inputs

Lane Width	12.0	ft
Rt-Side Lat. Clearance	6.0	ft
Number of Lanes, N	2	
Total Ramp Density, TRD	1.50	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	75.4	mph

Calc Speed Adj and FFS

f _{LW}	0.0	mph
f _{LC}	0.0	mph
TRD Adjustment	4.5	mph
FFS	70.9	mph

LOS and Performance Measures

Operational (LOS)

$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	1577	pc/h/ln
S	68.4	mph
$D = v_p / S$	23.1	pc/mi/ln
LOS	C	

Design (N)

Design (N)

Design LOS	
$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	pc/h/ln
S	mph
$D = v_p / S$	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v _p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
f _p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v _p - Exhibits 11-2, 11-3	

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst *JMV*
 Agency or Company *L&V Engineering*
 Date Performed *6/20/2013*
 Analysis Time Period *A.M. Peak Hour*

Site Information

Highway/Direction of Travel *I-80 Eastbound*
 From/To *Between Ints. 306 and 307*
 Jurisdiction
 Analysis Year *Existing 2013*

Project Description *Interstate 80 Reconstruction*

☒ Oper.(LOS)

☐ Des.(N)

☐ Planning Data

Flow Inputs

Volume, V	2264	veh/h	Peak-Hour Factor, PHF	0.83
AADT		veh/day	%Trucks and Buses, P _T	8
Peak-Hr Prop. of AADT, K			%RVs, P _R	1
Peak-Hr Direction Prop, D			General Terrain:	Rolling
DDHV = AADT x K x D		veh/h	Grade % Length	mi
			Up/Down %	

Calculate Flow Adjustments

f _p	0.95	E _R	2.0
E _T	2.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.885

Speed Inputs

Lane Width	12.0	ft
Rt-Side Lat. Clearance	6.0	ft
Number of Lanes, N	2	
Total Ramp Density, TRD	1.83	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	75.4	mph

Calc Speed Adj and FFS

f _{LW}	0.0	mph
f _{LC}	0.0	mph
TRD Adjustment	5.3	mph
FFS	70.1	mph

LOS and Performance Measures

Operational (LOS)

$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	1622	pc/h/ln
S	67.9	mph
$D = v_p / S$	23.9	pc/mi/ln
LOS	C	

Design (N)

Design (N)

Design LOS	
$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	pc/h/ln
S	mph
$D = v_p / S$	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
 V - Hourly volume
 v_p - Flow rate
 LOS - Level of service
 DDHV - Directional design hour volume

S - Speed
 D - Density
 FFS - Free-flow speed
 BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
 E_T - Exhibits 11-10, 11-11, 11-13
 f_p - Page 11-18
 LOS, S, FFS, v_p - Exhibits 11-2, 11-3

f_{LW} - Exhibit 11-8
 f_{LC} - Exhibit 11-9
 TRD - Page 11-11

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst *JMV*
 Agency or Company *L&V Engineering*
 Date Performed *6/20/2013*
 Analysis Time Period *P.M. Peak Hour*

Site Information

Highway/Direction of Travel *I-80 Eastbound*
 From/To *Between Ints. 306 and 307*
 Jurisdiction
 Analysis Year *Existing 2013*

Project Description *Interstate 80 Reconstruction*

☒ Oper.(LOS)

☐ Des.(N)

☐ Planning Data

Flow Inputs

Volume, V	2517	veh/h	Peak-Hour Factor, PHF	0.97
AADT		veh/day	%Trucks and Buses, P _T	10
Peak-Hr Prop. of AADT, K			%RVs, P _R	1
Peak-Hr Direction Prop, D			General Terrain:	Rolling
DDHV = AADT x K x D		veh/h	Grade % Length	mi
			Up/Down %	

Calculate Flow Adjustments

f _p	0.95	E _R	2.0
E _T	2.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.862

Speed Inputs

Lane Width	12.0	ft
Rt-Side Lat. Clearance	6.0	ft
Number of Lanes, N	2	
Total Ramp Density, TRD	1.83	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	75.4	mph

Calc Speed Adj and FFS

f _{LW}	0.0	mph
f _{LC}	0.0	mph
TRD Adjustment	5.3	mph
FFS	70.1	mph

LOS and Performance Measures

Operational (LOS)

v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	1584	pc/h/ln
S	68.3	mph
D = v _p / S	23.2	pc/mi/ln
LOS	C	

Design (N)

Design (N)

Design LOS	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
S	mph
D = v _p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
 V - Hourly volume
 v_p - Flow rate
 LOS - Level of service
 DDHV - Directional design hour volume

S - Speed
 D - Density
 FFS - Free-flow speed
 BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
 E_T - Exhibits 11-10, 11-11, 11-13
 f_p - Page 11-18
 LOS, S, FFS, v_p - Exhibits 11-2, 11-3

f_{LW} - Exhibit 11-8
 f_{LC} - Exhibit 11-9
 TRD - Page 11-11

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst *JMV*
 Agency or Company *L&V Engineering*
 Date Performed *6/20/2013*
 Analysis Time Period *A.M. Peak Hour*

Site Information

Highway/Direction of Travel *I-80 Westbound*
 From/To *Between Ints. 303 and 304*
 Jurisdiction
 Analysis Year *Existing 2013*

Project Description *Interstate 80 Reconstruction*

☒ Oper.(LOS)

☐ Des.(N)

☐ Planning Data

Flow Inputs

Volume, V	1128	veh/h	Peak-Hour Factor, PHF	0.97
AADT		veh/day	%Trucks and Buses, P _T	12
Peak-Hr Prop. of AADT, K			%RVs, P _R	1
Peak-Hr Direction Prop, D			General Terrain:	Rolling
DDHV = AADT x K x D		veh/h	Grade % Length	mi
			Up/Down %	

Calculate Flow Adjustments

f _p	0.95	E _R	2.0
E _T	2.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.840

Speed Inputs

Lane Width	12.0	ft
Rt-Side Lat. Clearance	6.0	ft
Number of Lanes, N	2	
Total Ramp Density, TRD	1.67	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	75.4	mph

Calc Speed Adj and FFS

f _{LW}	0.0	mph
f _{LC}	0.0	mph
TRD Adjustment	5.0	mph
FFS	70.4	mph

LOS and Performance Measures

Operational (LOS)

v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	728	pc/h/ln
S	70.0	mph
D = v _p / S	10.4	pc/mi/ln
LOS	A	

Design (N)

Design (N)

Design LOS	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
S	mph
D = v _p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
 V - Hourly volume
 v_p - Flow rate
 LOS - Level of service
 DDHV - Directional design hour volume

S - Speed
 D - Density
 FFS - Free-flow speed
 BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
 E_T - Exhibits 11-10, 11-11, 11-13
 f_p - Page 11-18
 LOS, S, FFS, v_p - Exhibits 11-2, 11-3

f_{LW} - Exhibit 11-8
 f_{LC} - Exhibit 11-9
 TRD - Page 11-11

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst *JMV*
 Agency or Company *L&V Engineering*
 Date Performed *6/20/2013*
 Analysis Time Period *P.M. Peak Hour*

Site Information

Highway/Direction of Travel *I-80 Westbound*
 From/To *Between Ints. 303 and 304*
 Jurisdiction
 Analysis Year *Existing 2013*

Project Description *Interstate 80 Reconstruction*

☒ Oper.(LOS)

☐ Des.(N)

☐ Planning Data

Flow Inputs

Volume, V	2371	veh/h	Peak-Hour Factor, PHF	0.97
AADT		veh/day	%Trucks and Buses, P _T	13
Peak-Hr Prop. of AADT, K			%RVs, P _R	1
Peak-Hr Direction Prop, D			General Terrain:	Rolling
DDHV = AADT x K x D		veh/h	Grade % Length	mi
			Up/Down %	

Calculate Flow Adjustments

f _p	0.95	E _R	2.0
E _T	2.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.830

Speed Inputs

Lane Width	12.0	ft
Rt-Side Lat. Clearance	6.0	ft
Number of Lanes, N	2	
Total Ramp Density, TRD	1.67	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	75.4	mph

Calc Speed Adj and FFS

f _{LW}	0.0	mph
f _{LC}	0.0	mph
TRD Adjustment	5.0	mph
FFS	70.4	mph

LOS and Performance Measures

Operational (LOS)

$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	1550	pc/h/ln
S	68.6	mph
$D = v_p / S$	22.6	pc/mi/ln
LOS	C	

Design (N)

Design (N)

Design LOS	
$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	pc/h/ln
S	mph
$D = v_p / S$	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v _p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
f _p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v _p - Exhibits 11-2, 11-3	

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst *JMV*
 Agency or Company *L&V Engineering*
 Date Performed *6/20/2013*
 Analysis Time Period *A.M. Peak Hour*

Site Information

Highway/Direction of Travel *I-80 Westbound*
 From/To *Between Ints. 304 and 305*
 Jurisdiction
 Analysis Year *Existing 2013*

Project Description *Interstate 80 Reconstruction*

☒ Oper.(LOS)

☐ Des.(N)

☐ Planning Data

Flow Inputs

Volume, V	<i>1671</i>	veh/h	Peak-Hour Factor, PHF	<i>0.95</i>
AADT		veh/day	%Trucks and Buses, P _T	<i>12</i>
Peak-Hr Prop. of AADT, K			%RVs, P _R	<i>1</i>
Peak-Hr Direction Prop, D			General Terrain:	<i>Rolling</i>
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>
			Up/Down %	

Calculate Flow Adjustments

f _p	<i>0.95</i>	E _R	<i>2.0</i>
E _T	<i>2.5</i>	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	<i>0.840</i>

Speed Inputs

Lane Width	<i>12.0</i>	ft
Rt-Side Lat. Clearance	<i>6.0</i>	ft
Number of Lanes, N	<i>2</i>	
Total Ramp Density, TRD	<i>1.67</i>	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	<i>75.4</i>	mph

Calc Speed Adj and FFS

f _{LW}	<i>0.0</i>	mph
f _{LC}	<i>0.0</i>	mph
TRD Adjustment	<i>5.0</i>	mph
FFS	<i>70.4</i>	mph

LOS and Performance Measures

Operational (LOS)

$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	<i>1102</i>	pc/h/ln
S	<i>70.0</i>	mph
$D = v_p / S$	<i>15.7</i>	pc/mi/ln
LOS	<i>B</i>	

Design (N)

Design (N)

Design LOS	
$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	pc/h/ln
S	mph
$D = v_p / S$	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
 V - Hourly volume
 v_p - Flow rate
 LOS - Level of service
 DDHV - Directional design hour volume

S - Speed
 D - Density
 FFS - Free-flow speed
 BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
 E_T - Exhibits 11-10, 11-11, 11-13
 f_p - Page 11-18
 LOS, S, FFS, v_p - Exhibits 11-2, 11-3

f_{LW} - Exhibit 11-8
 f_{LC} - Exhibit 11-9
 TRD - Page 11-11

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst *JMV*
 Agency or Company *L&V Engineering*
 Date Performed *6/20/2013*
 Analysis Time Period *P.M. Peak Hour*

Site Information

Highway/Direction of Travel *I-80 Westbound*
 From/To *Between Ints. 304 and 305*
 Jurisdiction
 Analysis Year *Existing 2013*

Project Description *Interstate 80 Reconstruction*

☒ Oper.(LOS)

☐ Des.(N)

☐ Planning Data

Flow Inputs

Volume, V	3433	veh/h	Peak-Hour Factor, PHF	0.97
AADT		veh/day	%Trucks and Buses, P _T	13
Peak-Hr Prop. of AADT, K			%RVs, P _R	1
Peak-Hr Direction Prop, D			General Terrain:	Rolling
DDHV = AADT x K x D		veh/h	Grade % Length	mi
			Up/Down %	

Calculate Flow Adjustments

f _p	0.95	E _R	2.0
E _T	2.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.830

Speed Inputs

Lane Width	12.0	ft
Rt-Side Lat. Clearance	6.0	ft
Number of Lanes, N	2	
Total Ramp Density, TRD	1.67	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	75.4	mph

Calc Speed Adj and FFS

f _{LW}	0.0	mph
f _{LC}	0.0	mph
TRD Adjustment	5.0	mph
FFS	70.4	mph

LOS and Performance Measures

Operational (LOS)

$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	2245	pc/h/ln
S	57.3	mph
$D = v_p / S$	39.2	pc/mi/ln
LOS	E	

Design (N)

Design (N)

Design LOS	
$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	pc/h/ln
S	mph
$D = v_p / S$	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v _p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
f _p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v _p - Exhibits 11-2, 11-3	

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst *JMV*
 Agency or Company *L&V Engineering*
 Date Performed *6/20/2013*
 Analysis Time Period *A.M. Peak Hour*

Site Information

Highway/Direction of Travel *I-80 Westbound*
 From/To *Between Ints. 305 and 306*
 Jurisdiction
 Analysis Year *Existing 2013*

Project Description *Interstate 80 Reconstruction*

☒ Oper.(LOS)

☐ Des.(N)

☐ Planning Data

Flow Inputs

Volume, V	<i>1648</i>	veh/h	Peak-Hour Factor, PHF	<i>0.93</i>
AADT		veh/day	%Trucks and Buses, P _T	<i>12</i>
Peak-Hr Prop. of AADT, K			%RVs, P _R	<i>1</i>
Peak-Hr Direction Prop, D			General Terrain:	<i>Rolling</i>
DDHV = AADT x K x D		veh/h	Grade % Length	<i>mi</i>
			Up/Down %	

Calculate Flow Adjustments

f _p	<i>0.95</i>	E _R	<i>2.0</i>
E _T	<i>2.5</i>	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	<i>0.840</i>

Speed Inputs

Lane Width	<i>12.0</i>	ft
Rt-Side Lat. Clearance	<i>6.0</i>	ft
Number of Lanes, N	<i>2</i>	
Total Ramp Density, TRD	<i>1.50</i>	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	<i>75.4</i>	mph

Calc Speed Adj and FFS

f _{LW}	<i>0.0</i>	mph
f _{LC}	<i>0.0</i>	mph
TRD Adjustment	<i>4.5</i>	mph
FFS	<i>70.9</i>	mph

LOS and Performance Measures

Operational (LOS)

v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	<i>1110</i>	pc/h/ln
S	<i>70.0</i>	mph
D = v _p / S	<i>15.9</i>	pc/mi/ln
LOS	<i>B</i>	

Design (N)

Design (N)

Design LOS	
v _p = (V or DDHV) / (PHF x N x f _{HV} x f _p)	pc/h/ln
S	mph
D = v _p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
 V - Hourly volume
 v_p - Flow rate
 LOS - Level of service
 DDHV - Directional design hour volume

S - Speed
 D - Density
 FFS - Free-flow speed
 BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
 E_T - Exhibits 11-10, 11-11, 11-13
 f_p - Page 11-18
 LOS, S, FFS, v_p - Exhibits 11-2, 11-3

f_{LW} - Exhibit 11-8
 f_{LC} - Exhibit 11-9
 TRD - Page 11-11

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst *JMV*
 Agency or Company *L&V Engineering*
 Date Performed *6/20/2013*
 Analysis Time Period *P.M. Peak Hour*

Site Information

Highway/Direction of Travel *I-80 Westbound*
 From/To *Between Ints. 305 and 306*
 Jurisdiction
 Analysis Year *Existing 2013*

Project Description *Interstate 80 Reconstruction*

☒ Oper.(LOS)

☐ Des.(N)

☐ Planning Data

Flow Inputs

Volume, V	3421	veh/h	Peak-Hour Factor, PHF	0.96
AADT		veh/day	%Trucks and Buses, P _T	13
Peak-Hr Prop. of AADT, K			%RVs, P _R	1
Peak-Hr Direction Prop, D			General Terrain:	Rolling
DDHV = AADT x K x D		veh/h	Grade % Length	mi
			Up/Down %	

Calculate Flow Adjustments

f _p	0.95	E _R	2.0
E _T	2.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.830

Speed Inputs

Lane Width	12.0	ft
Rt-Side Lat. Clearance	6.0	ft
Number of Lanes, N	2	
Total Ramp Density, TRD	1.50	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	75.4	mph

Calc Speed Adj and FFS

f _{LW}	0.0	mph
f _{LC}	0.0	mph
TRD Adjustment	4.5	mph
FFS	70.9	mph

LOS and Performance Measures

Operational (LOS)

$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	2260	pc/h/ln
S	57.0	mph
$D = v_p / S$	39.7	pc/mi/ln
LOS	E	

Design (N)

Design (N)

Design LOS	
$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	pc/h/ln
S	mph
$D = v_p / S$	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v _p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
f _p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v _p - Exhibits 11-2, 11-3	

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst *JMV*
 Agency or Company *L&V Engineering*
 Date Performed *6/20/2013*
 Analysis Time Period *A.M. Peak Hour*

Site Information

Highway/Direction of Travel *I-80 Westbound*
 From/To *Between Ints. 306 and 307*
 Jurisdiction
 Analysis Year *Existing 2013*

Project Description *Interstate 80 Reconstruction*

☒ Oper.(LOS)

☐ Des.(N)

☐ Planning Data

Flow Inputs

Volume, V	1719	veh/h	Peak-Hour Factor, PHF	0.91
AADT		veh/day	%Trucks and Buses, P _T	12
Peak-Hr Prop. of AADT, K			%RVs, P _R	1
Peak-Hr Direction Prop, D			General Terrain:	Rolling
DDHV = AADT x K x D		veh/h	Grade % Length	mi
			Up/Down %	

Calculate Flow Adjustments

f _p	0.95	E _R	2.0
E _T	2.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.840

Speed Inputs

Lane Width	12.0	ft
Rt-Side Lat. Clearance	6.0	ft
Number of Lanes, N	2	
Total Ramp Density, TRD	1.83	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	75.4	mph

Calc Speed Adj and FFS

f _{LW}	0.0	mph
f _{LC}	0.0	mph
TRD Adjustment	5.3	mph
FFS	70.1	mph

LOS and Performance Measures

Operational (LOS)

$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	1183	pc/h/ln
S	70.0	mph
$D = v_p / S$	16.9	pc/mi/ln
LOS	B	

Design (N)

Design (N)

Design LOS	
$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	pc/h/ln
S	mph
$D = v_p / S$	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes S - Speed
 V - Hourly volume D - Density
 v_p - Flow rate FFS - Free-flow speed
 LOS - Level of service BFFS - Base free-flow speed
 DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12 f_{LW} - Exhibit 11-8
 E_T - Exhibits 11-10, 11-11, 11-13 f_{LC} - Exhibit 11-9
 f_p - Page 11-18 TRD - Page 11-11
 LOS, S, FFS, v_p - Exhibits 11-2, 11-3

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst *JMV*
 Agency or Company *L&V Engineering*
 Date Performed *6/20/2013*
 Analysis Time Period *P.M. Peak Hour*

Site Information

Highway/Direction of Travel *I-80 Westbound*
 From/To *Between Ints. 306 and 307*
 Jurisdiction
 Analysis Year *Existing 2013*

Project Description *Interstate 80 Reconstruction*

☒ Oper.(LOS)

☐ Des.(N)

☐ Planning Data

Flow Inputs

Volume, V	3582	veh/h	Peak-Hour Factor, PHF	0.96
AADT		veh/day	%Trucks and Buses, P _T	12
Peak-Hr Prop. of AADT, K			%RVs, P _R	1
Peak-Hr Direction Prop, D			General Terrain:	Rolling
DDHV = AADT x K x D		veh/h	Grade % Length	mi
			Up/Down %	

Calculate Flow Adjustments

f _p	0.95	E _R	2.0
E _T	2.5	f _{HV} = 1/[1+P _T (E _T - 1) + P _R (E _R - 1)]	0.840

Speed Inputs

Lane Width	12.0	ft
Rt-Side Lat. Clearance	6.0	ft
Number of Lanes, N	2	
Total Ramp Density, TRD	1.83	ramps/mi
FFS (measured)		mph
Base free-flow Speed, BFFS	75.4	mph

Calc Speed Adj and FFS

f _{LW}	0.0	mph
f _{LC}	0.0	mph
TRD Adjustment	5.3	mph
FFS	70.1	mph

LOS and Performance Measures

Operational (LOS)

$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	2337	pc/h/ln
S	55.0	mph
$D = v_p / S$	42.5	pc/mi/ln
LOS	E	

Design (N)

Design (N)

Design LOS	
$v_p = (V \text{ or } DDHV) / (PHF \times N \times f_{HV} \times f_p)$	pc/h/ln
S	mph
$D = v_p / S$	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes	S - Speed
V - Hourly volume	D - Density
v _p - Flow rate	FFS - Free-flow speed
LOS - Level of service	BFFS - Base free-flow speed
DDHV - Directional design hour volume	

Factor Location

E _R - Exhibits 11-10, 11-12	f _{LW} - Exhibit 11-8
E _T - Exhibits 11-10, 11-11, 11-13	f _{LC} - Exhibit 11-9
f _p - Page 11-18	TRD - Page 11-11
LOS, S, FFS, v _p - Exhibits 11-2, 11-3	

RAMP JUNCTION HCS ANALYSIS

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Site Information

Analyst	JMV	Freeway/Dir of Travel	I-80 Eastbound
Agency or Company	L&V Engineering	Junction	Int. 304 from Route 209
Date Performed	6/25/2013	Jurisdiction	
Analysis Time Period	A.M. Peak Hour	Analysis Year	Existing 2013

Project Description Interstate 80 Reconstruction

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off $L_{up} =$ ft $V_u =$ veh/h	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Freeway Number of Lanes, N</td> <td style="width: 50%; text-align: right;">2</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td style="text-align: right;">1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td style="text-align: right;">800</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td style="text-align: right;">1351</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td style="text-align: right;">834</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td style="text-align: right;">70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td style="text-align: right;">35.0</td> </tr> </table>	Freeway Number of Lanes, N	2	Ramp Number of Lanes, N	1	Acceleration Lane Length, L_A	800	Deceleration Lane Length L_D		Freeway Volume, V_F	1351	Ramp Volume, V_R	834	Freeway Free-Flow Speed, S_{FF}	70.0	Ramp Free-Flow Speed, S_{FR}	35.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off $L_{down} =$ 1360 ft $V_D =$ 209 veh/h
Freeway Number of Lanes, N	2																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L_A	800																	
Deceleration Lane Length L_D																		
Freeway Volume, V_F	1351																	
Ramp Volume, V_R	834																	
Freeway Free-Flow Speed, S_{FF}	70.0																	
Ramp Free-Flow Speed, S_{FR}	35.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1351	0.94	Rolling	10	1	0.862	0.95	1755
Ramp	834	0.94	Rolling	5	1	0.922	0.95	1013
UpStream								
DownStream	209	0.82	Rolling	2	0	0.971	0.95	276

Merge Areas

Diverge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 $P_{FM} =$ 1.000 using Equation (Exhibit 13-6)
 $V_{12} =$ 1755 pc/h
 V_3 or $V_{av34} =$ 0 pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No
 Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☒ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 $P_{FD} =$ using Equation (Exhibit 13-7)
 $V_{12} =$ pc/h
 V_3 or $V_{av34} =$ pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No
 Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?
V_{FO}	2768	Exhibit 13-8	No

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V_{R12}	2768	Exhibit 13-8	4600:All No

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V_{12}		Exhibit 13-8	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 V_R + 0.0078 V_{12} - 0.00627 L_A$
 $D_R =$ 21.6 (pc/mi/ln)
 LOS = C (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 $D_R =$ (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

$M_S =$ 0.327 (Exhibit 13-11)
 $S_R =$ 60.8 mph (Exhibit 13-11)
 $S_0 =$ N/A mph (Exhibit 13-11)
 $S =$ 60.8 mph (Exhibit 13-13)

Speed Determination

$D_s =$ (Exhibit 13-12)
 $S_R =$ mph (Exhibit 13-12)
 $S_0 =$ mph (Exhibit 13-12)
 $S =$ mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Site Information

Analyst	JMV	Freeway/Dir of Travel	I-80 Eastbound
Agency or Company	L&V Engineering	Junction	Int. 304 from Route 209
Date Performed	6/25/2013	Jurisdiction	
Analysis Time Period	P.M. Peak Hour	Analysis Year	Existing 2013

Project Description Interstate 80 Reconstruction

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off $L_{up} =$ ft $V_u =$ veh/h	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Freeway Number of Lanes, N</td> <td style="width: 50%;">2</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td>1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td>800</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td>1704</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td>767</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td>70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td>35.0</td> </tr> </table>	Freeway Number of Lanes, N	2	Ramp Number of Lanes, N	1	Acceleration Lane Length, L_A	800	Deceleration Lane Length L_D		Freeway Volume, V_F	1704	Ramp Volume, V_R	767	Freeway Free-Flow Speed, S_{FF}	70.0	Ramp Free-Flow Speed, S_{FR}	35.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off $L_{down} =$ 1360 ft $V_D =$ 250 veh/h
Freeway Number of Lanes, N	2																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L_A	800																	
Deceleration Lane Length L_D																		
Freeway Volume, V_F	1704																	
Ramp Volume, V_R	767																	
Freeway Free-Flow Speed, S_{FF}	70.0																	
Ramp Free-Flow Speed, S_{FR}	35.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1704	0.94	Rolling	12	1	0.840	0.95	2271
Ramp	767	0.94	Rolling	2	1	0.962	0.95	893
UpStream								
DownStream	250	0.86	Rolling	3	0	0.957	0.95	320

Merge Areas

Diverge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 $P_{FM} =$ 1.000 using Equation (Exhibit 13-6)
 $V_{12} =$ 2271 pc/h
 V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No
 Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☒ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 $P_{FD} =$ using Equation (Exhibit 13-7)
 $V_{12} =$ pc/h
 V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No
 Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	3164	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V_{R12}	3164	Exhibit 13-8	4600:All
			No

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V_{12}		Exhibit 13-8	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 V_R + 0.0078 V_{12} - 0.00627 L_A$
 $D_R =$ 24.7 (pc/mi/ln)
 LOS = C (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 $D_R =$ (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

$M_S =$ 0.357 (Exhibit 13-11)
 $S_R =$ 60.0 mph (Exhibit 13-11)
 $S_0 =$ N/A mph (Exhibit 13-11)
 $S =$ 60.0 mph (Exhibit 13-13)

Speed Determination

$D_s =$ (Exhibit 13-12)
 $S_R =$ mph (Exhibit 13-12)
 $S_0 =$ mph (Exhibit 13-12)
 $S =$ mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst: JMV
 Agency or Company: L&V Engineering
 Date Performed: 6/25/2013
 Analysis Time Period: A.M. Peak Hour

Site Information

Freeway/Dir of Travel: I-80 Eastbound
 Junction: Int. 305 from W. Main Street
 Jurisdiction:
 Analysis Year: Existing 2013

Project Description: Interstate 80 Reconstruction

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off L _{up} = 800 ft V _u = 209 veh/h	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">Freeway Number of Lanes, N</td> <td style="width: 60%;">2</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td>1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td>170</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td>1976</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td>172</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td>70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td>35.0</td> </tr> </table>	Freeway Number of Lanes, N	2	Ramp Number of Lanes, N	1	Acceleration Lane Length, L _A	170	Deceleration Lane Length L _D		Freeway Volume, V _F	1976	Ramp Volume, V _R	172	Freeway Free-Flow Speed, S _{FF}	70.0	Ramp Free-Flow Speed, S _{FR}	35.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
Freeway Number of Lanes, N	2																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L _A	170																	
Deceleration Lane Length L _D																		
Freeway Volume, V _F	1976																	
Ramp Volume, V _R	172																	
Freeway Free-Flow Speed, S _{FF}	70.0																	
Ramp Free-Flow Speed, S _{FR}	35.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	1976	0.91	Rolling	10	1	0.862	0.95	2651
Ramp	172	0.74	Rolling	0	0	1.000	0.95	245
UpStream	209	0.82	Rolling	2	0	0.971	0.95	276
DownStream								

Merge Areas

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 L_{EQ} =
 P_{FM} = 1.000 using Equation (Exhibit 13-6)
 V₁₂ = 2651 pc/h
 V₃ or V_{av34} = 0 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? ☐ Yes ☒ No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 ☐ Yes ☒ No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Diverge Areas

Estimation of v₁₂

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 L_{EQ} =
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 ☐ Yes ☐ No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	2896	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V _{R12}	2896	Exhibit 13-8	4600:All No

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V ₁₂		Exhibit 13-8	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 V_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = 26.9 (pc/mi/ln)
 LOS = C (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

M_S = 0.380 (Exhibit 13-11)
 S_R = 59.4 mph (Exhibit 13-11)
 S₀ = N/A mph (Exhibit 13-11)
 S = 59.4 mph (Exhibit 13-13)

Speed Determination

D_s = (Exhibit 13-12)
 S_R = mph (Exhibit 13-12)
 S₀ = mph (Exhibit 13-12)
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst JMV
 Agency or Company L&V Engineering
 Date Performed 6/25/2013
 Analysis Time Period P.M. Peak Hour

Site Information

Freeway/Dir of Travel I-80 Eastbound
 Junction Int. 305 from W. Main Street
 Jurisdiction
 Analysis Year Existing 2013

Project Description Interstate 80 Reconstruction

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off L _{up} = 800 ft V _u = 250 veh/h	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">Freeway Number of Lanes, N</td> <td style="width: 60%;">2</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td>1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td>170</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td>2221</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td>196</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td>70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td>35.0</td> </tr> </table>	Freeway Number of Lanes, N	2	Ramp Number of Lanes, N	1	Acceleration Lane Length, L _A	170	Deceleration Lane Length L _D		Freeway Volume, V _F	2221	Ramp Volume, V _R	196	Freeway Free-Flow Speed, S _{FF}	70.0	Ramp Free-Flow Speed, S _{FR}	35.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
Freeway Number of Lanes, N	2																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L _A	170																	
Deceleration Lane Length L _D																		
Freeway Volume, V _F	2221																	
Ramp Volume, V _R	196																	
Freeway Free-Flow Speed, S _{FF}	70.0																	
Ramp Free-Flow Speed, S _{FR}	35.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	2221	0.95	Rolling	12	1	0.840	0.95	2929
Ramp	196	0.96	Rolling	0	0	1.000	0.95	215
UpStream	250	0.86	Rolling	3	0	0.957	0.95	320
DownStream								

Merge Areas

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 L_{EQ} = (Equation 13-6 or 13-7)
 P_{FM} = 1.000 using Equation (Exhibit 13-6)
 V₁₂ = 2929 pc/h
 V₃ or V_{av34} = 0 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? ☐ Yes ☒ No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 ☐ Yes ☒ No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Diverge Areas

Estimation of v₁₂

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 L_{EQ} = (Equation 13-12 or 13-13)
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 ☐ Yes ☐ No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	3144	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V _{R12}	3144	Exhibit 13-8	4600:All No

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V ₁₂		Exhibit 13-8	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 V_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = 28.8 (pc/mi/ln)
 LOS = D (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

M_S = 0.400 (Exhibit 13-11)
 S_R = 58.8 mph (Exhibit 13-11)
 S₀ = N/A mph (Exhibit 13-11)
 S = 58.8 mph (Exhibit 13-13)

Speed Determination

D_s = (Exhibit 13-12)
 S_R = mph (Exhibit 13-12)
 S₀ = mph (Exhibit 13-12)
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Site Information

Analyst	JMV	Freeway/Dir of Travel	I-80 Eastbound
Agency or Company	L&V Engineering	Junction	Int. 306 from Dreher Avenue
Date Performed	6/25/2013	Jurisdiction	
Analysis Time Period	A.M. Peak Hour	Analysis Year	Existing 2013

Project Description Interstate 80 Reconstruction

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off $L_{up} = 2100$ ft $V_u = 172$ veh/h	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Freeway Number of Lanes, N</td> <td style="width: 50%; text-align: right;">2</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td style="text-align: right;">1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td style="text-align: right;">320</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td style="text-align: right;">2148</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td style="text-align: right;">116</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td style="text-align: right;">70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td style="text-align: right;">35.0</td> </tr> </table>	Freeway Number of Lanes, N	2	Ramp Number of Lanes, N	1	Acceleration Lane Length, L_A	320	Deceleration Lane Length L_D		Freeway Volume, V_F	2148	Ramp Volume, V_R	116	Freeway Free-Flow Speed, S_{FF}	70.0	Ramp Free-Flow Speed, S_{FR}	35.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off $L_{down} =$ ft $V_D =$ veh/h
Freeway Number of Lanes, N	2																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L_A	320																	
Deceleration Lane Length L_D																		
Freeway Volume, V_F	2148																	
Ramp Volume, V_R	116																	
Freeway Free-Flow Speed, S_{FF}	70.0																	
Ramp Free-Flow Speed, S_{FR}	35.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2148	0.87	Rolling	10	1	0.862	0.95	3015
Ramp	116	0.67	Rolling	1	0	0.985	0.95	185
UpStream	172	0.74	Rolling	0	0	1.000	0.95	245
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 $P_{FM} = 1.000$ using Equation (Exhibit 13-6)
 $V_{12} = 3015$ pc/h
 V_3 or $V_{av34} = 0$ pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No
 Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☒ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 $P_{FD} =$ using Equation (Exhibit 13-7)
 $V_{12} =$ pc/h
 V_3 or $V_{av34} =$ pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No
 Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	3200	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V_{R12}	3200	Exhibit 13-8	4600:All No

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V_{12}		Exhibit 13-8	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 V_R + 0.0078 V_{12} - 0.00627 L_A$
 $D_R = 28.3$ (pc/mi/ln)
 LOS = D (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 $D_R =$ (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

$M_S = 0.394$ (Exhibit 13-11)
 $S_R = 59.0$ mph (Exhibit 13-11)
 $S_0 =$ N/A mph (Exhibit 13-11)
 $S = 59.0$ mph (Exhibit 13-13)

Speed Determination

$D_s =$ (Exhibit 13-12)
 $S_R =$ mph (Exhibit 13-12)
 $S_0 =$ mph (Exhibit 13-12)
 $S =$ mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst: JMV
 Agency or Company: L&V Engineering
 Date Performed: 6/25/2013
 Analysis Time Period: P.M. Peak Hour

Site Information

Freeway/Dir of Travel: I-80 Eastbound
 Junction: Int. 306 from Dreher Avenue
 Jurisdiction:
 Analysis Year: Existing 2013

Project Description: Interstate 80 Reconstruction

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off $L_{up} = 2100$ ft $V_u = 196$ veh/h	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">Freeway Number of Lanes, N</td> <td style="width: 60%;">2</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td>1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td>320</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td>2417</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td>100</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td>70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td>35.0</td> </tr> </table>	Freeway Number of Lanes, N	2	Ramp Number of Lanes, N	1	Acceleration Lane Length, L_A	320	Deceleration Lane Length L_D		Freeway Volume, V_F	2417	Ramp Volume, V_R	100	Freeway Free-Flow Speed, S_{FF}	70.0	Ramp Free-Flow Speed, S_{FR}	35.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off $L_{down} =$ ft $V_D =$ veh/h
Freeway Number of Lanes, N	2																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L_A	320																	
Deceleration Lane Length L_D																		
Freeway Volume, V_F	2417																	
Ramp Volume, V_R	100																	
Freeway Free-Flow Speed, S_{FF}	70.0																	
Ramp Free-Flow Speed, S_{FR}	35.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2417	0.96	Rolling	12	1	0.840	0.95	3154
Ramp	100	0.81	Rolling	1	0	0.985	0.95	132
UpStream	196	0.96	Rolling	0	0	1.000	0.95	215
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
 $L_{EQ} =$ (Equation 13-6 or 13-7)
 $P_{FM} = 1.000$ using Equation (Exhibit 13-6)
 $V_{12} = 3154$ pc/h
 V_3 or $V_{av34} = 0$ pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No
 Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☒ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 $L_{EQ} =$ (Equation 13-12 or 13-13)
 $P_{FD} =$ using Equation (Exhibit 13-7)
 $V_{12} =$ pc/h
 V_3 or $V_{av34} =$ pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No
 Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	3286	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V_{R12}	3286	Exhibit 13-8	4600:All No

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V_{12}		Exhibit 13-8	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 V_R + 0.0078 V_{12} - 0.00627 L_A$
 $D_R = 29.0$ (pc/mi/ln)
 LOS = D (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 $D_R =$ (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

$M_S = 0.403$ (Exhibit 13-11)
 $S_R = 58.7$ mph (Exhibit 13-11)
 $S_0 =$ N/A mph (Exhibit 13-11)
 $S = 58.7$ mph (Exhibit 13-13)

Speed Determination

$D_s =$ (Exhibit 13-12)
 $S_R =$ mph (Exhibit 13-12)
 $S_0 =$ mph (Exhibit 13-12)
 $S =$ mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst: JMV
 Agency or Company: L&V Engineering
 Date Performed: 6/25/2013
 Analysis Time Period: A.M. Peak Hour

Site Information

Freeway/Dir of Travel: I-80 Eastbound
 Junction: Int. 307 from Park Avenue
 Jurisdiction:
 Analysis Year: Existing 2013

Project Description: Interstate 80 Reconstruction

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off L _{up} = 950 ft V _u = 381 veh/h	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">Freeway Number of Lanes, N</td> <td style="width: 60%;">2</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td>1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td>240</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td>1883</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td>116</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td>70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td>35.0</td> </tr> </table>	Freeway Number of Lanes, N	2	Ramp Number of Lanes, N	1	Acceleration Lane Length, L _A	240	Deceleration Lane Length L _D		Freeway Volume, V _F	1883	Ramp Volume, V _R	116	Freeway Free-Flow Speed, S _{FF}	70.0	Ramp Free-Flow Speed, S _{FR}	35.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
Freeway Number of Lanes, N	2																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L _A	240																	
Deceleration Lane Length L _D																		
Freeway Volume, V _F	1883																	
Ramp Volume, V _R	116																	
Freeway Free-Flow Speed, S _{FF}	70.0																	
Ramp Free-Flow Speed, S _{FR}	35.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	1883	0.83	Rolling	8	1	0.885	0.95	2699
Ramp	116	0.85	Rolling	4	0	0.943	0.95	152
UpStream	381	0.82	Rolling	6	0	0.917	0.95	533
DownStream								

Merge Areas

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 L_{EQ} = (Equation 13-6 or 13-7)
 P_{FM} = 1.000 using Equation (Exhibit 13-6)
 V₁₂ = 2699 pc/h
 V₃ or V_{av34} = 0 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? ☐ Yes ☒ No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 ☐ Yes ☒ No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Diverge Areas

Estimation of v₁₂

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 L_{EQ} = (Equation 13-12 or 13-13)
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 ☐ Yes ☐ No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	2851	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V _{R12}	2851	Exhibit 13-8	4600:All No

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V ₁₂		Exhibit 13-8	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 V_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = 26.1 (pc/mi/ln)
 LOS = C (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

M_S = 0.372 (Exhibit 13-11)
 S_R = 59.6 mph (Exhibit 13-11)
 S₀ = N/A mph (Exhibit 13-11)
 S = 59.6 mph (Exhibit 13-13)

Speed Determination

D_s = (Exhibit 13-12)
 S_R = mph (Exhibit 13-12)
 S₀ = mph (Exhibit 13-12)
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Site Information

Analyst	JMV	Freeway/Dir of Travel	I-80 Eastbound
Agency or Company	L&V Engineering	Junction	Int. 307 from Park Avenue
Date Performed	6/25/2013	Jurisdiction	
Analysis Time Period	P.M. Peak Hour	Analysis Year	Existing 2013

Project Description Interstate 80 Reconstruction

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off $L_{up} = 950$ ft $V_u = 344$ veh/h	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Freeway Number of Lanes, N</td> <td style="width: 50%; text-align: right;">2</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td style="text-align: right;">1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td style="text-align: right;">240</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td style="text-align: right;">2173</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td style="text-align: right;">140</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td style="text-align: right;">70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td style="text-align: right;">35.0</td> </tr> </table>	Freeway Number of Lanes, N	2	Ramp Number of Lanes, N	1	Acceleration Lane Length, L_A	240	Deceleration Lane Length L_D		Freeway Volume, V_F	2173	Ramp Volume, V_R	140	Freeway Free-Flow Speed, S_{FF}	70.0	Ramp Free-Flow Speed, S_{FR}	35.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off $L_{down} =$ ft $V_D =$ veh/h
Freeway Number of Lanes, N	2																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L_A	240																	
Deceleration Lane Length L_D																		
Freeway Volume, V_F	2173																	
Ramp Volume, V_R	140																	
Freeway Free-Flow Speed, S_{FF}	70.0																	
Ramp Free-Flow Speed, S_{FR}	35.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2173	0.97	Rolling	10	1	0.862	0.95	2735
Ramp	140	0.63	Rolling	1	0	0.985	0.95	237
UpStream	344	0.84	Rolling	2	0	0.971	0.95	444
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 $P_{FM} = 1.000$ using Equation (Exhibit 13-6)
 $V_{12} = 2735$ pc/h
 V_3 or $V_{av34} = 0$ pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No
 Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☒ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 $P_{FD} =$ using Equation (Exhibit 13-7)
 $V_{12} =$ pc/h
 V_3 or $V_{av34} =$ pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No
 Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	2972	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}	2972	Exhibit 13-8	4600:All	No	V_{12}	Exhibit 13-8	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 V_R + 0.0078 V_{12} - 0.00627 L_A$
 $D_R = 27.0$ (pc/mi/ln)
 LOS = C (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 $D_R =$ (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

$M_S = 0.380$ (Exhibit 13-11)
 $S_R = 59.3$ mph (Exhibit 13-11)
 $S_0 =$ N/A mph (Exhibit 13-11)
 $S = 59.3$ mph (Exhibit 13-13)

Speed Determination

$D_s =$ (Exhibit 13-12)
 $S_R =$ mph (Exhibit 13-12)
 $S_0 =$ mph (Exhibit 13-12)
 $S =$ mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Site Information

Analyst	JMV	Freeway/Dir of Travel	I-80 Westbound
Agency or Company	L&V Engineering	Junction	Int. 303 from Route 611
Date Performed	6/25/2013	Jurisdiction	
Analysis Time Period	A.M. Peak Hour	Analysis Year	Existing 2013

Project Description Interstate 80 Reconstruction

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off $L_{up} = 4630$ ft $V_u = 543$ veh/h	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Freeway Number of Lanes, N</td> <td style="width: 50%;">2</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td>1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td>1080</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td>1128</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td>92</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td>70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td>35.0</td> </tr> </table>	Freeway Number of Lanes, N	2	Ramp Number of Lanes, N	1	Acceleration Lane Length, L_A	1080	Deceleration Lane Length L_D		Freeway Volume, V_F	1128	Ramp Volume, V_R	92	Freeway Free-Flow Speed, S_{FF}	70.0	Ramp Free-Flow Speed, S_{FR}	35.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off $L_{down} =$ ft $V_D =$ veh/h
Freeway Number of Lanes, N	2																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L_A	1080																	
Deceleration Lane Length L_D																		
Freeway Volume, V_F	1128																	
Ramp Volume, V_R	92																	
Freeway Free-Flow Speed, S_{FF}	70.0																	
Ramp Free-Flow Speed, S_{FR}	35.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1128	0.97	Rolling	12	1	0.840	0.95	1457
Ramp	92	0.74	Rolling	2	0	0.971	0.95	135
UpStream	543	0.94	Rolling	8	1	0.885	0.95	687
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 $P_{FM} = 1.000$ using Equation (Exhibit 13-6)
 $V_{12} = 1457$ pc/h
 V_3 or $V_{av34} = 0$ pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No
 Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☒ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 $P_{FD} =$ using Equation (Exhibit 13-7)
 $V_{12} =$ pc/h
 V_3 or $V_{av34} =$ pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No
 Is V_3 or $V_{av34} > 1.5 \times V_{12}/2$ ☐ Yes ☐ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}	1592	Exhibit 13-8	No	V_F		Exhibit 13-8	
				$V_{FO} = V_F - V_R$		Exhibit 13-8	
				V_R		Exhibit 13-10	

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}	1592	Exhibit 13-8	4600:All	No	V_{12}	Exhibit 13-8	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 V_R + 0.0078 V_{12} - 0.00627 L_A$
 $D_R = 11.1$ (pc/mi/ln)
 LOS = B (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 $D_R =$ (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

$M_S = 0.265$ (Exhibit 13-11)
 $S_R = 62.6$ mph (Exhibit 13-11)
 $S_0 =$ N/A mph (Exhibit 13-11)
 $S = 62.6$ mph (Exhibit 13-13)

Speed Determination

$D_s =$ (Exhibit 13-12)
 $S_R =$ mph (Exhibit 13-12)
 $S_0 =$ mph (Exhibit 13-12)
 $S =$ mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst JMV
 Agency or Company L&V Engineering
 Date Performed 6/25/2013
 Analysis Time Period P.M. Peak Hour

Site Information

Freeway/Dir of Travel I-80 Westbound
 Junction Int. 303 from Route 611
 Jurisdiction
 Analysis Year Existing 2013

Project Description Interstate 80 Reconstruction

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off L _{up} = 4630 ft V _u = 1062 veh/h	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">Freeway Number of Lanes, N</td> <td style="width: 60%;">2</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td>1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td>1080</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td>2371</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td>171</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td>70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td>35.0</td> </tr> </table>	Freeway Number of Lanes, N	2	Ramp Number of Lanes, N	1	Acceleration Lane Length, L _A	1080	Deceleration Lane Length L _D		Freeway Volume, V _F	2371	Ramp Volume, V _R	171	Freeway Free-Flow Speed, S _{FF}	70.0	Ramp Free-Flow Speed, S _{FR}	35.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
Freeway Number of Lanes, N	2																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L _A	1080																	
Deceleration Lane Length L _D																		
Freeway Volume, V _F	2371																	
Ramp Volume, V _R	171																	
Freeway Free-Flow Speed, S _{FF}	70.0																	
Ramp Free-Flow Speed, S _{FR}	35.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	2371	0.97	Rolling	13	1	0.830	0.95	3100
Ramp	171	0.87	Rolling	1	0	0.985	0.95	210
UpStream	1062	0.94	Rolling	2	1	0.962	0.95	1237
DownStream								

Merge Areas

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 P_{FM} = 1.000 using Equation (Exhibit 13-6)
 V₁₂ = 3100 pc/h
 V₃ or V_{av34} = 0 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? ☐ Yes ☒ No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 ☐ Yes ☒ No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Diverge Areas

Estimation of v₁₂

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 ☐ Yes ☐ No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	3310	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V _{R12}	3310	Exhibit 13-8	4600:All No

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V ₁₂		Exhibit 13-8	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 V_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = 24.4 (pc/mi/ln)
 LOS = C (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

M_S = 0.352 (Exhibit 13-11)
 S_R = 60.1 mph (Exhibit 13-11)
 S₀ = N/A mph (Exhibit 13-11)
 S = 60.1 mph (Exhibit 13-13)

Speed Determination

D_s = (Exhibit 13-12)
 S_R = mph (Exhibit 13-12)
 S₀ = mph (Exhibit 13-12)
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst: JMV
 Agency or Company: L&V Engineering
 Date Performed: 6/25/2013
 Analysis Time Period: A.M. Peak Hour

Site Information

Freeway/Dir of Travel: I-80 Westbound
 Junction: Int. 307 from Broad Street
 Jurisdiction:
 Analysis Year: Existing 2013

Project Description: Interstate 80 Reconstruction

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off L _{up} = 1600 ft V _u = 191 veh/h	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">Freeway Number of Lanes, N</td> <td style="width: 60%;">2</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td>1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td>180</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td>1468</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td>251</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td>70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td>35.0</td> </tr> </table>	Freeway Number of Lanes, N	2	Ramp Number of Lanes, N	1	Acceleration Lane Length, L _A	180	Deceleration Lane Length L _D		Freeway Volume, V _F	1468	Ramp Volume, V _R	251	Freeway Free-Flow Speed, S _{FF}	70.0	Ramp Free-Flow Speed, S _{FR}	35.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
Freeway Number of Lanes, N	2																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L _A	180																	
Deceleration Lane Length L _D																		
Freeway Volume, V _F	1468																	
Ramp Volume, V _R	251																	
Freeway Free-Flow Speed, S _{FF}	70.0																	
Ramp Free-Flow Speed, S _{FR}	35.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	1468	0.91	Rolling	12	1	0.840	0.95	2021
Ramp	251	0.91	Rolling	6	0	0.917	0.95	316
UpStream	191	0.90	Rolling	3	0	0.957	0.95	233
DownStream								

Merge Areas

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 P_{FM} = 1.000 using Equation (Exhibit 13-6)
 V₁₂ = 2021 pc/h
 V₃ or V_{av34} = 0 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? ☐ Yes ☒ No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 ☐ Yes ☒ No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Diverge Areas

Estimation of v₁₂

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 ☐ Yes ☐ No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	2337	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V _{R12}	2337	Exhibit 13-8	4600:All No

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V ₁₂		Exhibit 13-8	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 V_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = 22.4 (pc/mi/ln)
 LOS = C (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

M_S = 0.349 (Exhibit 13-11)
 S_R = 60.2 mph (Exhibit 13-11)
 S₀ = N/A mph (Exhibit 13-11)
 S = 60.2 mph (Exhibit 13-13)

Speed Determination

D_s = (Exhibit 13-12)
 S_R = mph (Exhibit 13-12)
 S₀ = mph (Exhibit 13-12)
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst: JMV
 Agency or Company: L&V Engineering
 Date Performed: 6/25/2013
 Analysis Time Period: P.M. Peak Hour

Site Information

Freeway/Dir of Travel: I-80 Westbound
 Junction: Int. 307 from Broad Street
 Jurisdiction:
 Analysis Year: Existing 2013

Project Description: Interstate 80 Reconstruction

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input checked="" type="checkbox"/> Off L _{up} = 1600 ft V _u = 297 veh/h	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">Freeway Number of Lanes, N</td> <td style="width: 60%;">2</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td>1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td>180</td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td></td> </tr> <tr> <td>Freeway Volume, V_F</td> <td>3163</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td>419</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td>70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td>35.0</td> </tr> </table>	Freeway Number of Lanes, N	2	Ramp Number of Lanes, N	1	Acceleration Lane Length, L _A	180	Deceleration Lane Length L _D		Freeway Volume, V _F	3163	Ramp Volume, V _R	419	Freeway Free-Flow Speed, S _{FF}	70.0	Ramp Free-Flow Speed, S _{FR}	35.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{down} = ft V _D = veh/h
Freeway Number of Lanes, N	2																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L _A	180																	
Deceleration Lane Length L _D																		
Freeway Volume, V _F	3163																	
Ramp Volume, V _R	419																	
Freeway Free-Flow Speed, S _{FF}	70.0																	
Ramp Free-Flow Speed, S _{FR}	35.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	3163	0.96	Rolling	12	1	0.840	0.95	4127
Ramp	419	0.89	Rolling	1	0	0.985	0.95	503
UpStream	297	0.88	Rolling	1	0	0.985	0.95	361
DownStream								

Merge Areas

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 (Equation 13-6 or 13-7)
 P_{FM} = 1.000 using Equation (Exhibit 13-6)
 V₁₂ = 4127 pc/h
 V₃ or V_{av34} = 0 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? ☐ Yes ☒ No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 ☐ Yes ☒ No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Diverge Areas

Estimation of v₁₂

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 (Equation 13-12 or 13-13)
 P_{FD} = using Equation (Exhibit 13-7)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 ☐ Yes ☐ No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V _{FO}	4630	Exhibit 13-8	No	V _F		Exhibit 13-8	
				V _{FO} = V _F - V _R		Exhibit 13-8	
				V _R		Exhibit 13-10	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V _{R12}	4630	Exhibit 13-8	4600:All Yes

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V ₁₂		Exhibit 13-8	

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 V_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = 40.2 (pc/mi/ln)
 LOS = E (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Speed Determination

M_S = 0.708 (Exhibit 13-11)
 S_R = 50.2 mph (Exhibit 13-11)
 S₀ = N/A mph (Exhibit 13-11)
 S = 50.2 mph (Exhibit 13-13)

Speed Determination

D_s = (Exhibit 13-12)
 S_R = mph (Exhibit 13-12)
 S₀ = mph (Exhibit 13-12)
 S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst JMV
 Agency or Company L&V Engineering
 Date Performed 6/25/2013
 Analysis Time Period A.M. Peak Hour

Site Information

Freeway/Dir of Travel I-80 Eastbound
 Junction Int. 303 to Route 611
 Jurisdiction
 Analysis Year Existing 2013

Project Description Interstate 80 Reconstruction

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	<table style="width: 100%;"> <tr> <td style="width: 50%;"> Freeway Number of Lanes, N 2 Ramp Number of Lanes, N 1 Acceleration Lane Length, L_A Deceleration Lane Length L_D 700 Freeway Volume, V_F 1516 Ramp Volume, V_R 165 Freeway Free-Flow Speed, S_{FF} 70.0 Ramp Free-Flow Speed, S_{FR} 35.0 </td> <td style="width: 50%;"></td> </tr> </table>	Freeway Number of Lanes, N 2 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A Deceleration Lane Length L _D 700 Freeway Volume, V _F 1516 Ramp Volume, V _R 165 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 35.0		Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 5500 ft V _D = 834 veh/h
Freeway Number of Lanes, N 2 Ramp Number of Lanes, N 1 Acceleration Lane Length, L _A Deceleration Lane Length L _D 700 Freeway Volume, V _F 1516 Ramp Volume, V _R 165 Freeway Free-Flow Speed, S _{FF} 70.0 Ramp Free-Flow Speed, S _{FR} 35.0				

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	1516	0.94	Rolling	10	1	0.862	0.95	1969
Ramp	165	0.72	Rolling	1	0	0.985	0.95	245
UpStream								
DownStream	834	0.94	Rolling	5	1	0.922	0.95	1013

Merge Areas

Diverge Areas

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 L_{EQ} = (Equation 13-6 or 13-7)
 P_{FM} = using Equation (Exhibit 13-6)
 V₁₂ = pc/h
 V₃ or V_{av34} pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 ☐ Yes ☐ No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v₁₂

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 L_{EQ} = (Equation 13-12 or 13-13)
 P_{FD} = 1.000 using Equation (Exhibit 13-7)
 V₁₂ = 1969 pc/h
 V₃ or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? ☐ Yes ☒ No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 ☐ Yes ☒ No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?
V _{FO}		Exhibit 13-8	

Capacity Checks

	Actual	Capacity	LOS F?
V _F	1969	Exhibit 13-8	4800 No
V _{FO} = V _F - V _R	1724	Exhibit 13-8	4800 No
V _R	245	Exhibit 13-10	2000 No

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V _{R12}		Exhibit 13-8	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V ₁₂	1969	Exhibit 13-8	4400:All No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = 14.9 (pc/mi/ln)
 LOS = B (Exhibit 13-2)

Speed Determination

M_S = (Exhibit 13-11)
 S_R = mph (Exhibit 13-11)
 S₀ = mph (Exhibit 13-11)
 S = mph (Exhibit 13-13)

Speed Determination

D_s = 0.450 (Exhibit 13-12)
 S_R = 57.4 mph (Exhibit 13-12)
 S₀ = N/A mph (Exhibit 13-12)
 S = 57.4 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst JMV
 Agency or Company L&V Engineering
 Date Performed 6/25/2013
 Analysis Time Period P.M. Peak Hour

Site Information

Freeway/Dir of Travel I-80 Eastbound
 Junction Int. 303 to Route 611
 Jurisdiction
 Analysis Year Existing 2013

Project Description Interstate 80 Reconstruction

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off $L_{up} =$ ft $V_u =$ veh/h	<table style="width: 100%;"> <tr> <td style="width: 50%;"> Freeway Number of Lanes, N 2 Ramp Number of Lanes, N 1 Acceleration Lane Length, L_A Deceleration Lane Length L_D 700 Freeway Volume, V_F 1922 Ramp Volume, V_R 218 Freeway Free-Flow Speed, S_{FF} 70.0 Ramp Free-Flow Speed, S_{FR} 35.0 </td> <td style="width: 50%;"></td> </tr> </table>	Freeway Number of Lanes, N 2 Ramp Number of Lanes, N 1 Acceleration Lane Length, L_A Deceleration Lane Length L_D 700 Freeway Volume, V_F 1922 Ramp Volume, V_R 218 Freeway Free-Flow Speed, S_{FF} 70.0 Ramp Free-Flow Speed, S_{FR} 35.0		Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off $L_{down} =$ 5500 ft $V_D =$ 767 veh/h
Freeway Number of Lanes, N 2 Ramp Number of Lanes, N 1 Acceleration Lane Length, L_A Deceleration Lane Length L_D 700 Freeway Volume, V_F 1922 Ramp Volume, V_R 218 Freeway Free-Flow Speed, S_{FF} 70.0 Ramp Free-Flow Speed, S_{FR} 35.0				

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1922	0.94	Rolling	12	1	0.840	0.95	2561
Ramp	218	0.97	Rolling	1	0	0.985	0.95	240
UpStream								
DownStream	767	0.94	Rolling	2	1	0.962	0.95	893

Merge Areas

Diverge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
 $L_{EQ} =$ (Equation 13-6 or 13-7)
 $P_{FM} =$ using Equation (Exhibit 13-6)
 $V_{12} =$ pc/h
 V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 $L_{EQ} =$ (Equation 13-12 or 13-13)
 $P_{FD} =$ 1.000 using Equation (Exhibit 13-7)
 $V_{12} =$ 2561 pc/h
 V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☒ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}		Exhibit 13-8		V_F	2561	Exhibit 13-8	4800 No
				$V_{FO} = V_F - V_R$	2321	Exhibit 13-8	4800 No
				V_R	240	Exhibit 13-10	2000 No

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}		Exhibit 13-8		V_{12}	2561	Exhibit 13-8	4400:All No

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 $D_R =$ (pc/mi/ln)
 LOS = (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 $D_R =$ 20.0 (pc/mi/ln)
 LOS = B (Exhibit 13-2)

Speed Determination

Speed Determination

$M_S =$ (Exhibit 13-11)
 $S_R =$ mph (Exhibit 13-11)
 $S_0 =$ mph (Exhibit 13-11)
 $S =$ mph (Exhibit 13-13)

$D_s =$ 0.450 (Exhibit 13-12)
 $S_R =$ 57.4 mph (Exhibit 13-12)
 $S_0 =$ N/A mph (Exhibit 13-12)
 $S =$ 57.4 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Site Information

Analyst	JMV	Freeway/Dir of Travel	I-80 Eastbound
Agency or Company	L&V Engineering	Junction	Int. 305 to W. Main Street
Date Performed	6/25/2013	Jurisdiction	
Analysis Time Period	A.M. Peak Hour	Analysis Year	Existing 2013

Project Description Interstate 80 Reconstruction

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off $L_{up} =$ ft $V_u =$ veh/h	<table border="0" style="width: 100%;"> <tr> <td style="width: 40%;">Freeway Number of Lanes, N</td> <td style="width: 60%; text-align: right;">2</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td style="text-align: right;">1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td></td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td style="text-align: right;">160</td> </tr> <tr> <td>Freeway Volume, V_F</td> <td style="text-align: right;">2185</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td style="text-align: right;">209</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td style="text-align: right;">70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td style="text-align: right;">35.0</td> </tr> </table>	Freeway Number of Lanes, N	2	Ramp Number of Lanes, N	1	Acceleration Lane Length, L_A		Deceleration Lane Length L_D	160	Freeway Volume, V_F	2185	Ramp Volume, V_R	209	Freeway Free-Flow Speed, S_{FF}	70.0	Ramp Free-Flow Speed, S_{FR}	35.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off $L_{down} =$ 700 ft $V_D =$ 172 veh/h
Freeway Number of Lanes, N	2																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L_A																		
Deceleration Lane Length L_D	160																	
Freeway Volume, V_F	2185																	
Ramp Volume, V_R	209																	
Freeway Free-Flow Speed, S_{FF}	70.0																	
Ramp Free-Flow Speed, S_{FR}	35.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2185	0.91	Rolling	10	1	0.862	0.95	2932
Ramp	209	0.82	Rolling	2	0	0.971	0.95	276
UpStream								
DownStream	172	0.74	Rolling	0	0	1.000	0.95	245

Merge Areas

Diverge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
 $L_{EQ} =$ (Equation 13-6 or 13-7)
 $P_{FM} =$ using Equation (Exhibit 13-6)
 $V_{12} =$ pc/h
 V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 $L_{EQ} =$ (Equation 13-12 or 13-13)
 $P_{FD} =$ 1.000 using Equation (Exhibit 13-7)
 $V_{12} =$ 2932 pc/h
 V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☒ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}		Exhibit 13-8		V_F	2932	Exhibit 13-8	4800 No
				$V_{FO} = V_F - V_R$	2656	Exhibit 13-8	4800 No
				V_R	276	Exhibit 13-10	2000 No

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}		Exhibit 13-8		V_{12}	2932	Exhibit 13-8	4400:All No

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 $D_R =$ (pc/mi/ln)
 $LOS =$ (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 $D_R =$ 28.0 (pc/mi/ln)
 $LOS =$ D (Exhibit 13-2)

Speed Determination

Speed Determination

$M_S =$ (Exhibit 13-11)
 $S_R =$ mph (Exhibit 13-11)
 $S_0 =$ mph (Exhibit 13-11)
 $S =$ mph (Exhibit 13-13)

$D_s =$ 0.453 (Exhibit 13-12)
 $S_R =$ 57.3 mph (Exhibit 13-12)
 $S_0 =$ N/A mph (Exhibit 13-12)
 $S =$ 57.3 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst: JMV
 Agency or Company: L&V Engineering
 Date Performed: 6/25/2013
 Analysis Time Period: P.M. Peak Hour

Site Information

Freeway/Dir of Travel: I-80 Eastbound
 Junction: Int. 305 to W. Main Street
 Jurisdiction:
 Analysis Year: Existing 2013

Project Description: Interstate 80 Reconstruction

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off $L_{up} =$ ft $V_u =$ veh/h	Freeway Number of Lanes, N 2 Ramp Number of Lanes, N 1 Acceleration Lane Length, L_A Deceleration Lane Length L_D 160 Freeway Volume, V_F 2471 Ramp Volume, V_R 250 Freeway Free-Flow Speed, S_{FF} 70.0 Ramp Free-Flow Speed, S_{FR} 35.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off $L_{down} =$ 700 ft $V_D =$ 196 veh/h
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Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2471	0.95	Rolling	12	1	0.840	0.95	3258
Ramp	250	0.86	Rolling	3	0	0.957	0.95	320
UpStream								
DownStream	196	0.96	Rolling	0	0	1.000	0.95	215

Merge Areas

Diverge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
 $L_{EQ} =$ (Equation 13-6 or 13-7)
 $P_{FM} =$ using Equation (Exhibit 13-6)
 $V_{12} =$ pc/h
 V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 $L_{EQ} =$ (Equation 13-12 or 13-13)
 $P_{FD} =$ 1.000 using Equation (Exhibit 13-7)
 $V_{12} =$ 3258 pc/h
 V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☒ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?
V_{FO}		Exhibit 13-8	

Capacity Checks

	Actual	Capacity	LOS F?
V_F	3258	Exhibit 13-8	4800 No
$V_{FO} = V_F - V_R$	2938	Exhibit 13-8	4800 No
V_R	320	Exhibit 13-10	2000 No

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V_{R12}		Exhibit 13-8	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V_{12}	3258	Exhibit 13-8	4400:All No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 $D_R =$ (pc/mi/ln)
 LOS = (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 $D_R =$ 30.8 (pc/mi/ln)
 LOS = D (Exhibit 13-2)

Speed Determination

$M_S =$ (Exhibit 13-11)
 $S_R =$ mph (Exhibit 13-11)
 $S_0 =$ mph (Exhibit 13-11)
 $S =$ mph (Exhibit 13-13)

Speed Determination

$D_s =$ 0.457 (Exhibit 13-12)
 $S_R =$ 57.2 mph (Exhibit 13-12)
 $S_0 =$ N/A mph (Exhibit 13-12)
 $S =$ 57.2 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Site Information

Analyst	JMV	Freeway/Dir of Travel	I-80 Eastbound
Agency or Company	L&V Engineering	Junction	Int. 307 to Park Avenue
Date Performed	6/25/2013	Jurisdiction	
Analysis Time Period	A.M. Peak Hour	Analysis Year	Existing 2013

Project Description Interstate 80 Reconstruction

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off $L_{up} =$ ft $V_u =$ veh/h	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Freeway Number of Lanes, N</td> <td style="width: 50%; text-align: right;">2</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td style="text-align: right;">1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td></td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td style="text-align: right;">150</td> </tr> <tr> <td>Freeway Volume, V_F</td> <td style="text-align: right;">2264</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td style="text-align: right;">381</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td style="text-align: right;">70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td style="text-align: right;">35.0</td> </tr> </table>	Freeway Number of Lanes, N	2	Ramp Number of Lanes, N	1	Acceleration Lane Length, L_A		Deceleration Lane Length L_D	150	Freeway Volume, V_F	2264	Ramp Volume, V_R	381	Freeway Free-Flow Speed, S_{FF}	70.0	Ramp Free-Flow Speed, S_{FR}	35.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off $L_{down} =$ 810 ft $V_D =$ 116 veh/h
Freeway Number of Lanes, N	2																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L_A																		
Deceleration Lane Length L_D	150																	
Freeway Volume, V_F	2264																	
Ramp Volume, V_R	381																	
Freeway Free-Flow Speed, S_{FF}	70.0																	
Ramp Free-Flow Speed, S_{FR}	35.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2264	0.83	Rolling	8	1	0.885	0.95	3245
Ramp	381	0.82	Rolling	6	0	0.917	0.95	533
UpStream								
DownStream	116	0.85	Rolling	4	0	0.943	0.95	152

Merge Areas

Diverge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
 $L_{EQ} =$ (Equation 13-6 or 13-7)
 $P_{FM} =$ using Equation (Exhibit 13-6)
 $V_{12} =$ pc/h
 V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 $L_{EQ} =$ (Equation 13-12 or 13-13)
 $P_{FD} =$ 1.000 using Equation (Exhibit 13-7)
 $V_{12} =$ 3245 pc/h
 V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☒ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS?		Actual	Capacity	LOS?
V_{FO}		Exhibit 13-8		V_F	3245	Exhibit 13-8	4800 No
				$V_{FO} = V_F - V_R$	2712	Exhibit 13-8	4800 No
				V_R	533	Exhibit 13-10	2000 No

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}		Exhibit 13-8		V_{12}	3245	Exhibit 13-8	4400:All No

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 $D_R =$ (pc/mi/ln)
 $LOS =$ (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 $D_R =$ 30.8 (pc/mi/ln)
 $LOS =$ D (Exhibit 13-2)

Speed Determination

Speed Determination

$M_S =$ (Exhibit 13-11)
 $S_R =$ mph (Exhibit 13-11)
 $S_0 =$ mph (Exhibit 13-11)
 $S =$ mph (Exhibit 13-13)

$D_s =$ 0.476 (Exhibit 13-12)
 $S_R =$ 56.7 mph (Exhibit 13-12)
 $S_0 =$ N/A mph (Exhibit 13-12)
 $S =$ 56.7 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Site Information

Analyst	JMV	Freeway/Dir of Travel	I-80 Eastbound
Agency or Company	L&V Engineering	Junction	Int. 307 to Park Avenue
Date Performed	6/25/2013	Jurisdiction	
Analysis Time Period	P.M. Peak Hour	Analysis Year	Existing 2013

Project Description Interstate 80 Reconstruction

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off $L_{up} =$ ft $V_u =$ veh/h	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Freeway Number of Lanes, N</td> <td style="width: 50%; text-align: right;">2</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td style="text-align: right;">1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td></td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td style="text-align: right;">150</td> </tr> <tr> <td>Freeway Volume, V_F</td> <td style="text-align: right;">2517</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td style="text-align: right;">344</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td style="text-align: right;">70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td style="text-align: right;">35.0</td> </tr> </table>	Freeway Number of Lanes, N	2	Ramp Number of Lanes, N	1	Acceleration Lane Length, L_A		Deceleration Lane Length L_D	150	Freeway Volume, V_F	2517	Ramp Volume, V_R	344	Freeway Free-Flow Speed, S_{FF}	70.0	Ramp Free-Flow Speed, S_{FR}	35.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off $L_{down} =$ 810 ft $V_D =$ 140 veh/h
Freeway Number of Lanes, N	2																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L_A																		
Deceleration Lane Length L_D	150																	
Freeway Volume, V_F	2517																	
Ramp Volume, V_R	344																	
Freeway Free-Flow Speed, S_{FF}	70.0																	
Ramp Free-Flow Speed, S_{FR}	35.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2517	0.97	Rolling	10	1	0.862	0.95	3168
Ramp	344	0.84	Rolling	2	0	0.971	0.95	444
UpStream								
DownStream	140	0.63	Rolling	1	0	0.985	0.95	237

Merge Areas

Diverge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
 $L_{EQ} =$ (Equation 13-6 or 13-7)
 $P_{FM} =$ using Equation (Exhibit 13-6)
 $V_{12} =$ pc/h
 V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 $L_{EQ} =$ (Equation 13-12 or 13-13)
 $P_{FD} =$ 1.000 using Equation (Exhibit 13-7)
 $V_{12} =$ 3168 pc/h
 V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☒ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}		Exhibit 13-8		V_F	3168	Exhibit 13-8	4800 No
				$V_{FO} = V_F - V_R$	2724	Exhibit 13-8	4800 No
				V_R	444	Exhibit 13-10	2000 No

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}		Exhibit 13-8		V_{12}	3168	Exhibit 13-8	4400:All No

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 $D_R =$ (pc/mi/ln)
 $LOS =$ (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 $D_R =$ 30.1 (pc/mi/ln)
 $LOS =$ D (Exhibit 13-2)

Speed Determination

Speed Determination

$M_S =$ (Exhibit 13-11)
 $S_R =$ mph (Exhibit 13-11)
 $S_0 =$ mph (Exhibit 13-11)
 $S =$ mph (Exhibit 13-13)

$D_s =$ 0.468 (Exhibit 13-12)
 $S_R =$ 56.9 mph (Exhibit 13-12)
 $S_0 =$ N/A mph (Exhibit 13-12)
 $S =$ 56.9 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst JMV
 Agency or Company L&V Engineering
 Date Performed 6/25/2013
 Analysis Time Period A.M. Peak Hour

Site Information

Freeway/Dir of Travel I-80 Westbound
 Junction Int. 305 to W. Main Street
 Jurisdiction
 Analysis Year Existing 2013

Project Description Interstate 80 Reconstruction

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off $L_{up} =$ ft $V_u =$ veh/h	<table style="width: 100%;"> <tr> <td style="width: 50%;"> Freeway Number of Lanes, N 2 Ramp Number of Lanes, N 1 Acceleration Lane Length, L_A Deceleration Lane Length L_D 120 Freeway Volume, V_F 1648 Ramp Volume, V_R 151 Freeway Free-Flow Speed, S_{FF} 70.0 Ramp Free-Flow Speed, S_{FR} 35.0 </td> <td style="width: 50%;"></td> </tr> </table>	Freeway Number of Lanes, N 2 Ramp Number of Lanes, N 1 Acceleration Lane Length, L_A Deceleration Lane Length L_D 120 Freeway Volume, V_F 1648 Ramp Volume, V_R 151 Freeway Free-Flow Speed, S_{FF} 70.0 Ramp Free-Flow Speed, S_{FR} 35.0		Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off $L_{down} =$ 740 ft $V_D =$ 174 veh/h
Freeway Number of Lanes, N 2 Ramp Number of Lanes, N 1 Acceleration Lane Length, L_A Deceleration Lane Length L_D 120 Freeway Volume, V_F 1648 Ramp Volume, V_R 151 Freeway Free-Flow Speed, S_{FF} 70.0 Ramp Free-Flow Speed, S_{FR} 35.0				

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1648	0.93	Rolling	12	1	0.840	0.95	2220
Ramp	151	0.84	Rolling	1	0	0.985	0.95	192
UpStream								
DownStream	174	0.87	Rolling	2	0	0.971	0.95	217

Merge Areas

Diverge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
 $L_{EQ} =$ (Equation 13-6 or 13-7)
 $P_{FM} =$ using Equation (Exhibit 13-6)
 $V_{12} =$ pc/h
 V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 $L_{EQ} =$ (Equation 13-12 or 13-13)
 $P_{FD} =$ 1.000 using Equation (Exhibit 13-7)
 $V_{12} =$ 2220 pc/h
 V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☒ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS?
V_{FO}		Exhibit 13-8	

Capacity Checks

	Actual	Capacity	LOS?
V_F	2220	Exhibit 13-8	4800 No
$V_{FO} = V_F - V_R$	2028	Exhibit 13-8	4800 No
V_R	192	Exhibit 13-10	2000 No

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V_{R12}		Exhibit 13-8	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V_{12}	2220	Exhibit 13-8	4400:All No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 $D_R =$ (pc/mi/ln)
 LOS = (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 $D_R =$ 22.3 (pc/mi/ln)
 LOS = C (Exhibit 13-2)

Speed Determination

$M_S =$ (Exhibit 13-11)
 $S_R =$ mph (Exhibit 13-11)
 $S_0 =$ mph (Exhibit 13-11)
 $S =$ mph (Exhibit 13-13)

Speed Determination

$D_s =$ 0.445 (Exhibit 13-12)
 $S_R =$ 57.5 mph (Exhibit 13-12)
 $S_0 =$ N/A mph (Exhibit 13-12)
 $S =$ 57.5 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst JMV
 Agency or Company L&V Engineering
 Date Performed 6/25/2013
 Analysis Time Period P.M. Peak Hour

Site Information

Freeway/Dir of Travel I-80 Westbound
 Junction Int. 305 to W. Main Street
 Jurisdiction
 Analysis Year Existing 2013

Project Description Interstate 80 Reconstruction

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off $L_{up} =$ ft $V_u =$ veh/h	<table border="0" style="width: 100%;"> <tr> <td style="width: 40%;">Freeway Number of Lanes, N</td> <td style="width: 10%; text-align: center;">2</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td style="text-align: center;">1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td></td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td style="text-align: center;">120</td> </tr> <tr> <td>Freeway Volume, V_F</td> <td style="text-align: center;">3421</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td style="text-align: center;">308</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td style="text-align: center;">70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td style="text-align: center;">35.0</td> </tr> </table>	Freeway Number of Lanes, N	2	Ramp Number of Lanes, N	1	Acceleration Lane Length, L_A		Deceleration Lane Length L_D	120	Freeway Volume, V_F	3421	Ramp Volume, V_R	308	Freeway Free-Flow Speed, S_{FF}	70.0	Ramp Free-Flow Speed, S_{FR}	35.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off $L_{down} =$ 740 ft $V_D =$ 320 veh/h
Freeway Number of Lanes, N	2																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L_A																		
Deceleration Lane Length L_D	120																	
Freeway Volume, V_F	3421																	
Ramp Volume, V_R	308																	
Freeway Free-Flow Speed, S_{FF}	70.0																	
Ramp Free-Flow Speed, S_{FR}	35.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3421	0.96	Rolling	13	1	0.830	0.95	4520
Ramp	308	0.90	Rolling	1	0	0.985	0.95	366
UpStream								
DownStream	320	0.78	Rolling	1	0	0.985	0.95	438

Merge Areas

Diverge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
 $L_{EQ} =$ (Equation 13-6 or 13-7)
 $P_{FM} =$ using Equation (Exhibit 13-6)
 $V_{12} =$ pc/h
 V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 $L_{EQ} =$ (Equation 13-12 or 13-13)
 $P_{FD} =$ 1.000 using Equation (Exhibit 13-7)
 $V_{12} =$ 4520 pc/h
 V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☒ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?
V_{FO}		Exhibit 13-8	
	V_F	4520	Exhibit 13-8 4800 No
	$V_{FO} = V_F - V_R$	4154	Exhibit 13-8 4800 No
	V_R	366	Exhibit 13-10 2000 No

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V_{R12}		Exhibit 13-8	

	Actual	Max Desirable	Violation?
V_{12}	4520	Exhibit 13-8 4400:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 $D_R =$ (pc/mi/ln)
 LOS = (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 $D_R =$ 42.0 (pc/mi/ln)
 LOS = E (Exhibit 13-2)

Speed Determination

$M_S =$ (Exhibit 13-11)
 $S_R =$ mph (Exhibit 13-11)
 $S_0 =$ mph (Exhibit 13-11)
 $S =$ mph (Exhibit 13-13)

Speed Determination

$D_s =$ 0.461 (Exhibit 13-12)
 $S_R =$ 57.1 mph (Exhibit 13-12)
 $S_0 =$ N/A mph (Exhibit 13-12)
 $S =$ 57.1 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Site Information

Analyst JMV Freeway/Dir of Travel I-80 Westbound
 Agency or Company L&V Engineering Junction Int. 306 to Dreher Avenue
 Date Performed 6/25/2013 Jurisdiction
 Analysis Time Period A.M. Peak Hour Analysis Year Existing 2013

Project Description Interstate 80 Reconstruction

Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L_A		<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ 3680 ft	Deceleration Lane Length L_D	140	$L_{down} =$ ft
$V_u =$ 251 veh/h	Freeway Volume, V_F	1719	$V_D =$ veh/h
	Ramp Volume, V_R	71	
	Freeway Free-Flow Speed, S_{FF}	70.0	
	Ramp Free-Flow Speed, S_{FR}	35.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1719	0.91	Rolling	12	1	0.840	0.95	2366
Ramp	71	0.66	Rolling	3	0	0.957	0.95	118
UpStream	251	0.91	Rolling	6	0	0.917	0.95	316
DownStream								

Merge Areas

Diverge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
 $L_{EQ} =$ (Equation 13-6 or 13-7)
 $P_{FM} =$ using Equation (Exhibit 13-6)
 $V_{12} =$ pc/h
 V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 $L_{EQ} =$ (Equation 13-12 or 13-13)
 $P_{FD} =$ 1.000 using Equation (Exhibit 13-7)
 $V_{12} =$ 2366 pc/h
 V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☒ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS?		Actual	Capacity	LOS?
V_{FO}		Exhibit 13-8		V_F	2366	Exhibit 13-8	4800 No
				$V_{FO} = V_F - V_R$	2248	Exhibit 13-8	4800 No
				V_R	118	Exhibit 13-10	2000 No

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}		Exhibit 13-8		V_{12}	2366	Exhibit 13-8	4400:All No

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 $D_R =$ (pc/mi/ln)
 LOS = (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 $D_R =$ 23.3 (pc/mi/ln)
 LOS = C (Exhibit 13-2)

Speed Determination

Speed Determination

$M_S =$ (Exhibit 13-11)
 $S_R =$ mph (Exhibit 13-11)
 $S_0 =$ mph (Exhibit 13-11)
 $S =$ mph (Exhibit 13-13)

$D_s =$ 0.439 (Exhibit 13-12)
 $S_R =$ 57.7 mph (Exhibit 13-12)
 $S_0 =$ N/A mph (Exhibit 13-12)
 $S =$ 57.7 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst: JMV
 Agency or Company: L&V Engineering
 Date Performed: 6/25/2013
 Analysis Time Period: P.M. Peak Hour

Site Information

Freeway/Dir of Travel: I-80 Westbound
 Junction: Int. 306 to Dreher Avenue
 Jurisdiction:
 Analysis Year: Existing 2013

Project Description: Interstate 80 Reconstruction

Inputs

Upstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off $L_{up} =$ 3680 ft $V_u =$ 419 veh/h	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;"> Freeway Number of Lanes, N 2 Ramp Number of Lanes, N 1 Acceleration Lane Length, L_A Deceleration Lane Length L_D 140 Freeway Volume, V_F 3582 Ramp Volume, V_R 161 Freeway Free-Flow Speed, S_{FF} 70.0 Ramp Free-Flow Speed, S_{FR} 35.0 </td> <td style="width: 50%;"></td> </tr> </table>	Freeway Number of Lanes, N 2 Ramp Number of Lanes, N 1 Acceleration Lane Length, L_A Deceleration Lane Length L_D 140 Freeway Volume, V_F 3582 Ramp Volume, V_R 161 Freeway Free-Flow Speed, S_{FF} 70.0 Ramp Free-Flow Speed, S_{FR} 35.0		Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off $L_{down} =$ ft $V_D =$ veh/h
Freeway Number of Lanes, N 2 Ramp Number of Lanes, N 1 Acceleration Lane Length, L_A Deceleration Lane Length L_D 140 Freeway Volume, V_F 3582 Ramp Volume, V_R 161 Freeway Free-Flow Speed, S_{FF} 70.0 Ramp Free-Flow Speed, S_{FR} 35.0				

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3582	0.96	Rolling	12	1	0.840	0.95	4674
Ramp	161	0.82	Rolling	3	0	0.957	0.95	216
UpStream	419	0.89	Rolling	1	0	0.985	0.95	503
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
 $L_{EQ} =$ (Equation 13-6 or 13-7)
 $P_{FM} =$ using Equation (Exhibit 13-6)
 $V_{12} =$ pc/h
 V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 $L_{EQ} =$ (Equation 13-12 or 13-13)
 $P_{FD} =$ 1.000 using Equation (Exhibit 13-7)
 $V_{12} =$ 4674 pc/h
 V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☒ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS?
V_{FO}		Exhibit 13-8	

Capacity Checks

	Actual	Capacity	LOS?
V_F	4674	Exhibit 13-8	4800 No
$V_{FO} = V_F - V_R$	4458	Exhibit 13-8	4800 No
V_R	216	Exhibit 13-10	2000 No

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V_{R12}		Exhibit 13-8	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V_{12}	4674	Exhibit 13-8	4400:All Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 $D_R =$ (pc/mi/ln)
 LOS = (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 $D_R =$ 43.2 (pc/mi/ln)
 LOS = E (Exhibit 13-2)

Speed Determination

$M_S =$ (Exhibit 13-11)
 $S_R =$ mph (Exhibit 13-11)
 $S_0 =$ mph (Exhibit 13-11)
 $S =$ mph (Exhibit 13-13)

Speed Determination

$D_s =$ 0.447 (Exhibit 13-12)
 $S_R =$ 57.5 mph (Exhibit 13-12)
 $S_0 =$ N/A mph (Exhibit 13-12)
 $S =$ 57.5 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Site Information

Analyst	JMV	Freeway/Dir of Travel	I-80 Westbound
Agency or Company	L&V Engineering	Junction	Int. 307 to Broad Street
Date Performed	6/25/2013	Jurisdiction	
Analysis Time Period	A.M. Peak Hour	Analysis Year	Existing 2013

Project Description Interstate 80 Reconstruction

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off $L_{up} =$ ft $V_u =$ veh/h	<table border="0" style="width: 100%;"> <tr> <td style="width: 40%;">Freeway Number of Lanes, N</td> <td style="width: 60%; text-align: right;">2</td> </tr> <tr> <td>Ramp Number of Lanes, N</td> <td style="text-align: right;">1</td> </tr> <tr> <td>Acceleration Lane Length, L_A</td> <td></td> </tr> <tr> <td>Deceleration Lane Length L_D</td> <td style="text-align: right;">150</td> </tr> <tr> <td>Freeway Volume, V_F</td> <td style="text-align: right;">1659</td> </tr> <tr> <td>Ramp Volume, V_R</td> <td style="text-align: right;">191</td> </tr> <tr> <td>Freeway Free-Flow Speed, S_{FF}</td> <td style="text-align: right;">70.0</td> </tr> <tr> <td>Ramp Free-Flow Speed, S_{FR}</td> <td style="text-align: right;">35.0</td> </tr> </table>	Freeway Number of Lanes, N	2	Ramp Number of Lanes, N	1	Acceleration Lane Length, L_A		Deceleration Lane Length L_D	150	Freeway Volume, V_F	1659	Ramp Volume, V_R	191	Freeway Free-Flow Speed, S_{FF}	70.0	Ramp Free-Flow Speed, S_{FR}	35.0	Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off $L_{down} =$ 1470 ft $V_D =$ 251 veh/h
Freeway Number of Lanes, N	2																	
Ramp Number of Lanes, N	1																	
Acceleration Lane Length, L_A																		
Deceleration Lane Length L_D	150																	
Freeway Volume, V_F	1659																	
Ramp Volume, V_R	191																	
Freeway Free-Flow Speed, S_{FF}	70.0																	
Ramp Free-Flow Speed, S_{FR}	35.0																	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1659	0.91	Rolling	12	1	0.840	0.95	2284
Ramp	191	0.90	Rolling	3	0	0.957	0.95	233
UpStream								
DownStream	251	0.91	Rolling	6	0	0.917	0.95	316

Merge Areas

Diverge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$
 $L_{EQ} =$ (Equation 13-6 or 13-7)
 $P_{FM} =$ using Equation (Exhibit 13-6)
 $V_{12} =$ pc/h
 V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☐ No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☐ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 $L_{EQ} =$ (Equation 13-12 or 13-13)
 $P_{FD} =$ 1.000 using Equation (Exhibit 13-7)
 $V_{12} =$ 2284 pc/h
 V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
 Is V_3 or $V_{av34} > 2,700$ pc/h? ☐ Yes ☒ No
 Is V_3 or $V_{av34} > 1.5 * V_{12}/2$ ☐ Yes ☒ No
 If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V_{FO}		Exhibit 13-8		V_F	2284	Exhibit 13-8	4800 No
				$V_{FO} = V_F - V_R$	2051	Exhibit 13-8	4800 No
				V_R	233	Exhibit 13-10	2000 No

Flow Entering Merge Influence Area

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V_{R12}		Exhibit 13-8		V_{12}	2284	Exhibit 13-8	4400:All No

Level of Service Determination (if not F)

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 $D_R =$ (pc/mi/ln)
 LOS = (Exhibit 13-2)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 $D_R =$ 22.5 (pc/mi/ln)
 LOS = C (Exhibit 13-2)

Speed Determination

Speed Determination

$M_S =$ (Exhibit 13-11)
 $S_R =$ mph (Exhibit 13-11)
 $S_0 =$ mph (Exhibit 13-11)
 $S =$ mph (Exhibit 13-13)

$D_s =$ 0.449 (Exhibit 13-12)
 $S_R =$ 57.4 mph (Exhibit 13-12)
 $S_0 =$ N/A mph (Exhibit 13-12)
 $S =$ 57.4 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst: JMV
 Agency or Company: L&V Engineering
 Date Performed: 6/25/2013
 Analysis Time Period: P.M. Peak Hour

Site Information

Freeway/Dir of Travel: I-80 Westbound
 Junction: Int. 307 to Broad Street
 Jurisdiction:
 Analysis Year: Existing 2013

Project Description: Interstate 80 Reconstruction

Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input checked="" type="checkbox"/> No <input type="checkbox"/> Off L _{up} = ft V _u = veh/h	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"> Freeway Number of Lanes, N: 2 Ramp Number of Lanes, N: 1 Acceleration Lane Length, L_A: Deceleration Lane Length L_D: 150 Freeway Volume, V_F: 3460 Ramp Volume, V_R: 297 Freeway Free-Flow Speed, S_{FF}: 70.0 Ramp Free-Flow Speed, S_{FR}: 35.0 </td> <td style="width: 50%;"></td> </tr> </table>	Freeway Number of Lanes, N: 2 Ramp Number of Lanes, N: 1 Acceleration Lane Length, L _A : Deceleration Lane Length L _D : 150 Freeway Volume, V _F : 3460 Ramp Volume, V _R : 297 Freeway Free-Flow Speed, S _{FF} : 70.0 Ramp Free-Flow Speed, S _{FR} : 35.0		Downstream Adj Ramp <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L _{down} = 1470 ft V _D = 419 veh/h
Freeway Number of Lanes, N: 2 Ramp Number of Lanes, N: 1 Acceleration Lane Length, L _A : Deceleration Lane Length L _D : 150 Freeway Volume, V _F : 3460 Ramp Volume, V _R : 297 Freeway Free-Flow Speed, S _{FF} : 70.0 Ramp Free-Flow Speed, S _{FR} : 35.0				

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF x f _{HV} x f _p
Freeway	3460	0.96	Rolling	12	1	0.840	0.95	4515
Ramp	297	0.88	Rolling	1	0	0.985	0.95	361
UpStream								
DownStream	419	0.89	Rolling	1	0	0.985	0.95	503

Merge Areas

Diverge Areas

Estimation of v₁₂

$V_{12} = V_F (P_{FM})$
 L_{EQ} = (Equation 13-6 or 13-7)
 P_{FM} = using Equation (Exhibit 13-6)
 V₁₂ = pc/h
 V₃ or V_{av34} = pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 ☐ Yes ☐ No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v₁₂

$V_{12} = V_R + (V_F - V_R)P_{FD}$
 L_{EQ} = (Equation 13-12 or 13-13)
 P_{FD} = 1.000 using Equation (Exhibit 13-7)
 V₁₂ = 4515 pc/h
 V₃ or V_{av34} = 0 pc/h (Equation 13-14 or 13-17)
 Is V₃ or V_{av34} > 2,700 pc/h? ☐ Yes ☒ No
 Is V₃ or V_{av34} > 1.5 * V₁₂/2 ☐ Yes ☒ No
 If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity	LOS F?
V _{FO}		Exhibit 13-8	

Capacity Checks

	Actual	Capacity	LOS F?
V _F	4515	Exhibit 13-8	4800 No
V _{FO} = V _F - V _R	4154	Exhibit 13-8	4800 No
V _R	361	Exhibit 13-10	2000 No

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V _{R12}		Exhibit 13-8	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V ₁₂	4515	Exhibit 13-8	4400:All Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$
 D_R = (pc/mi/ln)
 LOS = (Exhibit 13-2)

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$
 D_R = 41.7 (pc/mi/ln)
 LOS = E (Exhibit 13-2)

Speed Determination

M_S = (Exhibit 13-11)
 S_R = mph (Exhibit 13-11)
 S₀ = mph (Exhibit 13-11)
 S = mph (Exhibit 13-13)

Speed Determination

D_s = 0.460 (Exhibit 13-12)
 S_R = 57.1 mph (Exhibit 13-12)
 S₀ = N/A mph (Exhibit 13-12)
 S = 57.1 mph (Exhibit 13-13)

WEAVE HCS ANALYSIS

FREEWAY WEAVING WORKSHEET									
General Information					Site Information				
Analyst	JMV				Freeway/Dir of Travel	I-80 Westbound			
Agency/Company	L&V Engineering				Weaving Segment Location	Int. 305 to 304			
Date Performed	6/27/2013				Analysis Year	Existing 2013			
Analysis Time Period	A.M. Peak Hour								
Project Description <i>Interstate 80 Reconstruction</i>									
Inputs									
Weaving configuration	One-Sided				Segment type	Freeway			
Weaving number of lanes, N	3				Freeway minimum speed, S_{MIN}	15			
Weaving segment length, L_S	565ft				Freeway maximum capacity, C_{IFL}	2400			
Freeway free-flow speed, FFS	70 mph				Terrain type	Rolling			
Conversions to pc/h Under Base Conditions									
	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	1018	0.95	12	1	2.5	2.0	0.840	0.95	1342
V_{RF}	110	0.87	2	0	2.5	2.0	0.971	0.95	137
V_{FR}	479	0.94	8	1	2.5	2.0	0.885	0.95	606
V_{RR}	64	0.87	2	0	2.5	2.0	0.971	0.95	80
V_{NW}	1422							V =	2165
V_W	743								
VR	0.343								
Configuration Characteristics									
Minimum maneuver lanes, N_{WL}	2 lc				Minimum weaving lane changes, LC_{MIN}	743 lc/h			
Interchange density, ID	1.7 int/mi				Weaving lane changes, LC_W	869 lc/h			
Minimum RF lane changes, LC_{RF}	1 lc/pc				Non-weaving lane changes, LC_{NW}	21 lc/h			
Minimum FR lane changes, LC_{FR}	1 lc/pc				Total lane changes, LC_{ALL}	890 lc/h			
Minimum RR lane changes, LC_{RR}	lc/pc				Non-weaving vehicle index, I_{NW}	137			
Weaving Segment Speed, Density, Level of Service, and Capacity									
Weaving segment flow rate, v	2165 pc/h				Weaving intensity factor, W	0.323			
Weaving segment capacity, c_w	4742 veh/h				Weaving segment speed, S	59.5 mph			
Weaving segment v/c ratio	0.364				Average weaving speed, S_W	56.6 mph			
Weaving segment density, D	12.1 pc/mi/ln				Average non-weaving speed, S_{NW}	61.2 mph			
Level of Service, LOS	B				Maximum weaving length, L_{MAX}	6052 ft			
Notes									
a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".									
b. For volumes that exceed the weaving segment capacity, the level of service is "F".									

FREEWAY WEAVING WORKSHEET									
General Information					Site Information				
Analyst	JMV				Freeway/Dir of Travel	I-80 Westbound			
Agency/Company	L&V Engineering				Weaving Segment Location	Int. 305 to 304			
Date Performed	6/27/2013				Analysis Year	Existing 2013			
Analysis Time Period	P.M. Peak Hour								
Project Description <i>Interstate 80 Reconstruction</i>									
Inputs									
Weaving configuration	One-Sided				Segment type	Freeway			
Weaving number of lanes, N	3				Freeway minimum speed, S_{MIN}	15			
Weaving segment length, L_S	565ft				Freeway maximum capacity, C_{IFL}	2400			
Freeway free-flow speed, FFS	70 mph				Terrain type	Rolling			
Conversions to pc/h Under Base Conditions									
	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	2148	0.97	13	1	2.5	2.0	0.830	0.95	2809
V_{RF}	223	0.78	1	0	2.5	2.0	0.985	0.95	305
V_{FR}	965	0.94	2	1	2.5	2.0	0.962	0.95	1124
V_{RR}	97	0.78	1	0	2.5	2.0	0.985	0.95	133
V_{NW}	2942							V =	4371
V_W	1429								
VR	0.327								
Configuration Characteristics									
Minimum maneuver lanes, N_{WL}	2 lc				Minimum weaving lane changes, LC_{MIN}	1429 lc/h			
Interchange density, ID	1.7 int/mi				Weaving lane changes, LC_W	1555 lc/h			
Minimum RF lane changes, LC_{RF}	1 lc/pc				Non-weaving lane changes, LC_{NW}	334 lc/h			
Minimum FR lane changes, LC_{FR}	1 lc/pc				Total lane changes, LC_{ALL}	1889 lc/h			
Minimum RR lane changes, LC_{RR}	lc/pc				Non-weaving vehicle index, I_{NW}	283			
Weaving Segment Speed, Density, Level of Service, and Capacity									
Weaving segment flow rate, v	4371 pc/h				Weaving intensity factor, W	0.586			
Weaving segment capacity, c_w	4716 veh/h				Weaving segment speed, S	51.7 mph			
Weaving segment v/c ratio	0.731				Average weaving speed, S_W	49.7 mph			
Weaving segment density, D	28.2 pc/mi/ln				Average non-weaving speed, S_{NW}	52.7 mph			
Level of Service, LOS	D				Maximum weaving length, L_{MAX}	5875 ft			
Notes									
a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments". b. For volumes that exceed the weaving segment capacity, the level of service is "F".									

UNSIGNALIZED INTERSECTION HCS ANALYSIS

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	JMV	Intersection	SR 611 & I-80 EB Off Ramp
Agency/Co.	L&V Engineering	Jurisdiction	
Date Performed	6/17/2013	Analysis Year	Existing 2013
Analysis Time Period	A.M. Peak Hour		
Project Description Interstate 80 Reconstruction			
East/West Street: SR 611 (N. 9th Street)		North/South Street: I-80 EB Off Ramp	
Intersection Orientation: East-West		Study Period (hrs): 0.25	

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		455			490	
Peak-Hour Factor, PHF	1.00	0.88	1.00	1.00	0.87	1.00
Hourly Flow Rate, HFR (veh/h)	0	517	0	0	563	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Two Way Left Turn Lane					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		T			T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)			158			
Peak-Hour Factor, PHF	1.00	1.00	0.72	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	219	0	0	0
Percent Heavy Vehicles	0	0	1	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			1			0
Lanes	0	0	1	0	0	0
Configuration			R			

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration					R			
v (veh/h)					219			
C (m) (veh/h)					588			
v/c					0.37			
95% queue length					1.72			
Control Delay (s/veh)					14.7			
LOS					B			
Approach Delay (s/veh)	--	--	14.7					
Approach LOS	--	--	B					

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	JMV	Intersection	SR 611 & I-80 EB Off Ramp
Agency/Co.	L&V Engineering	Jurisdiction	
Date Performed	6/17/2013	Analysis Year	Existing 2013
Analysis Time Period	P.M. Peak Hour		
Project Description <i>Interstate 80 Reconstruction</i>			
East/West Street: <i>SR 611 (N. 9th Street)</i>		North/South Street: <i>I-80 EB Off Ramp</i>	
Intersection Orientation: <i>East-West</i>		Study Period (hrs): <i>0.25</i>	

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		624			752	
Peak-Hour Factor, PHF	1.00	0.92	1.00	1.00	0.96	1.00
Hourly Flow Rate, HFR (veh/h)	0	678	0	0	783	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Two Way Left Turn Lane					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		T			T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)			216			
Peak-Hour Factor, PHF	1.00	1.00	0.98	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	220	0	0	0
Percent Heavy Vehicles	0	0	1	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			1			0
Lanes	0	0	1	0	0	0
Configuration			R			

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration					R			
v (veh/h)					220			
C (m) (veh/h)					475			
v/c					0.46			
95% queue length					2.41			
Control Delay (s/veh)					18.9			
LOS					C			
Approach Delay (s/veh)	--	--	18.9					
Approach LOS	--	--	C					

Two-Way Stop Controlled Intersection Level of Service Calculations
Interchange 303 SR 611 and I-80 Eastbound Off Ramp
Existing Year 2013

A.M. Peak Hour

Movement	Volume	Delay
SR 611 EB thru	455	0
SR 611 WB thru	490	0
I-80 EB Off Ramp NB right	158	14.7
Overall LOS	1103	2.1 A

P.M. Peak Hour

Movement	Volume	Delay
SR 611 EB thru	624	0
SR 611 WB thru	752	0
I-80 EB Off Ramp NB right	216	18.9
Overall LOS	1592	2.6 A

TWO-WAY STOP CONTROL SUMMARY

General Information				Site Information				
Analyst	JMV			Intersection	SR 611 & Shopping Ctr Side Rd			
Agency/Co.	L&V Engineering			Jurisdiction				
Date Performed	6/17/2013			Analysis Year	Existing 2013			
Analysis Time Period	A.M. Peak Hour							
Project Description <i>Interstate 80 Reconstruction</i>								
East/West Street: <i>SR 611 (N. 9th Street)</i>				North/South Street: <i>Shopping Center Side Road</i>				
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)	6	443			485	12		
Peak-Hour Factor, PHF	0.38	0.86	1.00	1.00	0.88	0.60		
Hourly Flow Rate, HFR (veh/h)	15	515	0	0	551	19		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Two Way Left Turn Lane							
RT Channelized			0			0		
Lanes	1	1	0	0	1	0		
Configuration	L	T				TR		
Upstream Signal		0			0			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)				12		5		
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.60	1.00	0.63		
Hourly Flow Rate, HFR (veh/h)	0	0	0	19	0	7		
Percent Heavy Vehicles	0	0	0	0	0	0		
Percent Grade (%)	0			-2				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	0	0	0	0		
Configuration					LR			
Delay, Queue Length, and Level of Service								
Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L						LR	
v (veh/h)	15						26	
C (m) (veh/h)	763						473	
v/c	0.02						0.05	
95% queue length	0.06						0.17	
Control Delay (s/veh)	9.8						13.1	
LOS	A						B	
Approach Delay (s/veh)	--	--				13.1		
Approach LOS	--	--				B		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	JMV
Agency/Co.	L&V Engineering
Date Performed	6/17/2013
Analysis Time Period	P.M. Peak Hour

Site Information

Intersection	SR 611 & Shopping Ctr Side Rd
Jurisdiction	
Analysis Year	Existing 2013

Project Description *Interstate 80 Reconstruction*

East/West Street: *SR 611 (N. 9th Street)*

North/South Street: *Shopping Center Side Road*

Intersection Orientation: *East-West*

Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	15	610			721	33
Peak-Hour Factor, PHF	0.54	0.91	1.00	1.00	0.96	0.69
Hourly Flow Rate, HFR (veh/h)	27	670	0	0	751	47
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	<i>Two Way Left Turn Lane</i>					
RT Channelized			0			0
Lanes	1	1	0	0	1	0
Configuration	L	T				TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				14		10
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.70	1.00	0.50
Hourly Flow Rate, HFR (veh/h)	0	0	0	20	0	20
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			-2		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L						LR	
v (veh/h)	27						40	
C (m) (veh/h)	630						376	
v/c	0.04						0.11	
95% queue length	0.13						0.35	
Control Delay (s/veh)	11.0						15.7	
LOS	B						C	
Approach Delay (s/veh)	--	--				15.7		
Approach LOS	--	--				C		

Two-Way Stop Controlled Intersection Level of Service Calculations
Interchange 303 SR 611 and Shopping Center Side Road
Existing Year 2013

A.M. Peak Hour

Movement	Volume	Delay
SR 611 EB left	6	9.8
SR 611 EB thru	443	0
SR 611 WB thru	485	0
SR 611 WB right	12	0
Shopping Ctr Side Rd SB left	12	13.1
Shopping Ctr Side Rd SB right	5	13.1
Overall	963	0.3
LOS		A

P.M. Peak Hour

Movement	Volume	Delay
SR 611 EB left	15	11.0
SR 611 EB thru	610	0
SR 611 WB thru	721	0
SR 611 WB right	33	0
Shopping Ctr Side Rd SB left	14	15.7
Shopping Ctr Side Rd SB right	10	15.7
Overall	1403	0.4
LOS		A

TWO-WAY STOP CONTROL SUMMARY

General Information			Site Information	
Analyst	JMV		Intersection	W. Main Street & I-80 EB Ramps
Agency/Co.	L&V Engineering		Jurisdiction	
Date Performed	6/17/2013		Analysis Year	Existing 2013
Analysis Time Period	A.M. Peak Hour			

Project Description *Interstate 80 Reconstruction*

East/West Street: *W. Main Street (SR 1012)*

North/South Street: *I-80 EB Ramps*

Intersection Orientation: *East-West*

Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		254	153	19	370	
Peak-Hour Factor, PHF	1.00	0.95	0.81	0.43	0.91	1.00
Hourly Flow Rate, HFR (veh/h)	0	267	188	44	406	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	1	0	1	0
Configuration		T	R	LT		
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	27		182			
Peak-Hour Factor, PHF	0.75	1.00	0.77	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	36	0	236	0	0	0
Percent Heavy Vehicles	4	0	2	0	0	0
Percent Grade (%)	-1			0		
Flared Approach		Y			N	
Storage		5			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (veh/h)		44		272				
C (m) (veh/h)		836		944				
v/c		0.05		0.29				
95% queue length		0.17		1.20				
Control Delay (s/veh)		9.5		11.6				
LOS		A		B				
Approach Delay (s/veh)	--	--	11.6					
Approach LOS	--	--	B					

TWO-WAY STOP CONTROL SUMMARY

General Information			Site Information	
Analyst	JMV		Intersection	W. Main Street & I-80 EB Ramps
Agency/Co.	L&V Engineering		Jurisdiction	
Date Performed	6/17/2013		Analysis Year	Existing 2013
Analysis Time Period	P.M. Peak Hour			

Project Description *Interstate 80 Reconstruction*

East/West Street: *W. Main Street (SR 1212)*

North/South Street: *I-80 EB Ramps*

Intersection Orientation: *East-West*

Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		322	168	28	715	
Peak-Hour Factor, PHF	1.00	0.90	0.93	0.70	0.88	1.00
Hourly Flow Rate, HFR (veh/h)	0	357	180	40	812	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	1	0	1	0
Configuration		T	R	LT		
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	52		198			
Peak-Hour Factor, PHF	0.87	1.00	0.85	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	59	0	232	0	0	0
Percent Heavy Vehicles	2	0	3	0	0	0
Percent Grade (%)	-1			0		
Flared Approach		Y			N	
Storage		5			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (veh/h)		40		291				
C (m) (veh/h)		777		904				
v/c		0.05		0.32				
95% queue length		0.16		1.40				
Control Delay (s/veh)		9.9		15.7				
LOS		A		C				
Approach Delay (s/veh)	--	--	15.7					
Approach LOS	--	--	C					

**Two-Way Stop Controlled Intersection Level of Service Calculations
Interchange 305 W. Main Street (SR 2012) and I-80 Eastbound Ramps
Existing Year 2013**

A.M. Peak Hour

Movement	Volume	Delay
W. Main Street EB thru	254	0
W. Main Street EB right	153	0
W. Main Street WB left	19	9.5
W. Main Street WB thru	370	9.5
I-80 EB Off Ramp NB left	27	11.6
I-80 EB Off Ramp NB right	182	11.6
Overall LOS	1005	6.1 A

P.M. Peak Hour

Movement	Volume	Delay
W. Main Street EB thru	322	0
W. Main Street EB right	168	0
W. Main Street WB left	28	9.9
W. Main Street WB thru	715	9.9
I-80 EB Off Ramp NB left	52	15.7
I-80 EB Off Ramp NB right	198	15.7
Overall LOS	1483	7.6 A

TWO-WAY STOP CONTROL SUMMARY

General Information			Site Information	
Analyst	JMV		Intersection	W. Main Street & I-80 WB Ramps
Agency/Co.	L&V Engineering		Jurisdiction	
Date Performed	6/17/2013		Analysis Year	Existing 2013
Analysis Time Period	A.M. Peak Hour			

Project Description *Interstate 80 Reconstruction*

East/West Street: *W. Main Street (SR 1212)*

North/South Street: *I-80 WB Ramps*

Intersection Orientation: *East-West*

Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	25	411			256	149
Peak-Hour Factor, PHF	0.69	0.85	1.00	1.00	0.87	0.83
Hourly Flow Rate, HFR (veh/h)	36	483	0	0	294	179
Percent Heavy Vehicles	4	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	1
Configuration	LT				T	R
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				18		133
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.75	1.00	0.85
Hourly Flow Rate, HFR (veh/h)	0	0	0	24	0	156
Percent Heavy Vehicles	0	0	0	0	0	1
Percent Grade (%)	0			-1		
Flared Approach		N			Y	
Storage		0			1	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (veh/h)	36						180	
C (m) (veh/h)	813						918	
v/c	0.04						0.20	
95% queue length	0.14						0.73	
Control Delay (s/veh)	9.6						11.3	
LOS	A						B	
Approach Delay (s/veh)	--	--				11.3		
Approach LOS	--	--				B		

TWO-WAY STOP CONTROL SUMMARY

General Information			Site Information	
Analyst	JMV		Intersection	W. Main Street & I-80 WB Ramps
Agency/Co.	L&V Engineering		Jurisdiction	
Date Performed	6/17/2013		Analysis Year	Existing 2013
Analysis Time Period	P.M. Peak Hour			

Project Description *Interstate 80 Reconstruction*

East/West Street: *W. Main Street (SR 1212)*

North/South Street: *I-80 WB Ramps*

Intersection Orientation: *East-West*

Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	38	482			468	282
Peak-Hour Factor, PHF	0.79	0.91	1.00	1.00	0.91	0.73
Hourly Flow Rate, HFR (veh/h)	48	529	0	0	514	386
Percent Heavy Vehicles	3	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	1
Configuration	LT				T	R
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				33		275
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.83	1.00	0.85
Hourly Flow Rate, HFR (veh/h)	0	0	0	39	0	323
Percent Heavy Vehicles	0	0	0	0	0	1
Percent Grade (%)	0			-1		
Flared Approach		N			Y	
Storage		0			1	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (veh/h)	48						362	
C (m) (veh/h)	572						565	
v/c	0.08						0.64	
95% queue length	0.27						4.54	
Control Delay (s/veh)	11.9						22.0	
LOS	B						C	
Approach Delay (s/veh)	--	--				22.0		
Approach LOS	--	--				C		

**Two-Way Stop Controlled Intersection Level of Service Calculations
Interchange 305 W. Main Street (SR 2012) and I-80 Westbound Ramps
Existing Year 2013**

A.M. Peak Hour

Movement	Volume	Delay
W. Main Street EB left	25	9.6
W. Main Street EB thru	411	9.6
W. Main Street WB thru	256	0
W. Main Street WB right	149	0
I-80 WB Off Ramp SB left	18	11.3
I-80 WB Off Ramp SB right	133	11.3
Overall	992	5.9
LOS		A

P.M. Peak Hour

Movement	Volume	Delay
W. Main Street EB left	38	11.9
W. Main Street EB thru	482	11.9
W. Main Street WB thru	468	0
W. Main Street WB right	282	0
I-80 WB Off Ramp SB left	33	22.0
I-80 WB Off Ramp SB right	275	22.0
Overall	1578	8.2
LOS		A

TWO-WAY STOP CONTROL SUMMARY

General Information			Site Information	
Analyst	JMV		Intersection	Dreher Ave. & I-80 EB On Ramp
Agency/Co.	L&V Engineering		Jurisdiction	
Date Performed	6/18/2013		Analysis Year	Existing 2013
Analysis Time Period	A.M. Peak Hour			

Project Description *Interstate 80 Reconstruction*

East/West Street: *Dreher Avenue (SR 2004)*

North/South Street: *I-80 EB On Ramp*

Intersection Orientation: *East-West*

Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		129	73	43	91	
Peak-Hour Factor, PHF	1.00	0.85	0.59	0.90	0.95	1.00
Hourly Flow Rate, HFR (veh/h)	0	151	123	47	95	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration						

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT						
v (veh/h)		47						
C (m) (veh/h)		968						
v/c		0.05						
95% queue length		0.15						
Control Delay (s/veh)		8.9						
LOS		A						
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

TWO-WAY STOP CONTROL SUMMARY

General Information			Site Information	
Analyst	JMV		Intersection	Dreher Ave. & I-80 EB On Ramp
Agency/Co.	L&V Engineering		Jurisdiction	
Date Performed	6/18/2013		Analysis Year	Existing 2013
Analysis Time Period	P.M. Peak Hour			

Project Description *Interstate 80 Reconstruction*

East/West Street: *Dreher Avenue (SR 2004)*

North/South Street: *I-80 EB On Ramp*

Intersection Orientation: *East-West*

Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		111	45	55	234	
Peak-Hour Factor, PHF	1.00	0.82	0.66	0.76	0.79	1.00
Hourly Flow Rate, HFR (veh/h)	0	135	68	72	296	0
Percent Heavy Vehicles	0	--	--	2	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration						

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT						
v (veh/h)		72						
C (m) (veh/h)		1015						
v/c		0.07						
95% queue length		0.23						
Control Delay (s/veh)		8.8						
LOS		A						
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

Two-Way Stop Controlled Intersection Level of Service Calculations
Interchange 306 Dreher Avenue (SR 2004) and I-80 Eastbound On Ramp
Existing Year 2013

A.M. Peak Hour

Movement	Volume	Delay
Dreher Avenue EB thru	129	0
Dreher Avenue EB right	73	0
Dreher Avenue WB left	43	8.9
Dreher Avenue WB thru	91	8.9
Overall	336	3.5
LOS		A

P.M. Peak Hour

Movement	Volume	Delay
Dreher Avenue EB thru	111	0
Dreher Avenue EB right	45	0
Dreher Avenue WB left	55	8.8
Dreher Avenue WB thru	234	8.8
Overall	445	5.7
LOS		A

TWO-WAY STOP CONTROL SUMMARY

General Information			Site Information	
Analyst	JMV		Intersection	Dreher Ave. & I-80 WB Off Ramp
Agency/Co.	L&V Engineering		Jurisdiction	
Date Performed	6/18/2013		Analysis Year	Existing 2013
Analysis Time Period	A.M. Peak Hour			

Project Description *Interstate 80 Reconstruction*

East/West Street: *Dreher Avenue (SR 2004)*

North/South Street: *I-80 WB Off Ramp*

Intersection Orientation: *East-West*

Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		125			114	
Peak-Hour Factor, PHF	1.00	0.80	1.00	1.00	0.77	1.00
Hourly Flow Rate, HFR (veh/h)	0	156	0	0	148	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		T			T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	27		44			
Peak-Hour Factor, PHF	0.61	1.00	0.69	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	44	0	63	0	0	0
Percent Heavy Vehicles	0	0	5	0	0	0
Percent Grade (%)	-1			0		
Flared Approach		Y			N	
Storage		1			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration				LR				
v (veh/h)				107				
C (m) (veh/h)				1593				
v/c				0.07				
95% queue length				0.22				
Control Delay (s/veh)				9.4				
LOS				A				
Approach Delay (s/veh)	--	--	9.4					
Approach LOS	--	--	A					

TWO-WAY STOP CONTROL SUMMARY

General Information			Site Information	
Analyst	JMV		Intersection	Dreher Ave. & I-80 WB Off Ramp
Agency/Co.	L&V Engineering		Jurisdiction	
Date Performed	6/18/2013		Analysis Year	Existing 2013
Analysis Time Period	P.M. Peak Hour			

Project Description *Interstate 80 Reconstruction*

East/West Street: *Dreher Avenue (SR 2004)*

North/South Street: *I-80 WB Off Ramp*

Intersection Orientation: *East-West*

Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		90			196	
Peak-Hour Factor, PHF	1.00	0.94	1.00	1.00	0.71	1.00
Hourly Flow Rate, HFR (veh/h)	0	95	0	0	276	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		T			T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	88		73			
Peak-Hour Factor, PHF	0.88	1.00	0.65	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	100	0	112	0	0	0
Percent Heavy Vehicles	2	0	4	0	0	0
Percent Grade (%)	-1			0		
Flared Approach		Y			N	
Storage		1			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration				LR				
v (veh/h)				212				
C (m) (veh/h)				1529				
v/c				0.14				
95% queue length				0.48				
Control Delay (s/veh)				9.8				
LOS				A				
Approach Delay (s/veh)	--	--	9.8					
Approach LOS	--	--	A					

Two-Way Stop Controlled Intersection Level of Service Calculations
Interchange 306 Dreher Avenue (SR 2004) and I-80 Westbound Off Ramp
Existing Year 2013

A.M. Peak Hour

Movement	Volume	Delay
Dreher Avenue EB thru	125	0
Dreher Avenue WB thru	114	0
I-80 WB Off Ramp NB left	27	9.4
I-80 WB Off Ramp NB right	44	9.4
Overall	310	2.2
LOS		A

P.M. Peak Hour

Movement	Volume	Delay
Dreher Avenue EB thru	90	0
Dreher Avenue WB thru	196	0
I-80 WB Off Ramp NB left	88	9.8
I-80 WB Off Ramp NB right	73	9.8
Overall	447	3.5
LOS		A

TWO-WAY STOP CONTROL SUMMARY

General Information			Site Information	
Analyst	JMV		Intersection	Park Avenue & I-80 EB Ramps
Agency/Co.	L&V Engineering		Jurisdiction	
Date Performed	6/18/2013		Analysis Year	Existing 2013
Analysis Time Period	A.M. Peak Hour			

Project Description *Interstate 80 Reconstruction*

East/West Street: *I-80 EB Ramps/Barry Street*

North/South Street: *Park Avenue (SR 611)*

Intersection Orientation: *North-South*

Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	27	109			68	82
Peak-Hour Factor, PHF	0.84	0.83	1.00	1.00	0.85	0.82
Hourly Flow Rate, HFR (veh/h)	32	131	0	0	79	100
Percent Heavy Vehicles	4	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	274		107	0	7	8
Peak-Hour Factor, PHF	0.77	1.00	0.92	0.90	0.58	0.67
Hourly Flow Rate, HFR (veh/h)	355	0	116	0	12	11
Percent Heavy Vehicles	4	0	8	0	14	13
Percent Grade (%)	-1			-3		
Flared Approach		Y			N	
Storage		1			0	
RT Channelized			0			0
Lanes	0	0	0	0	1	0
Configuration		LR			LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LTR			LR	
v (veh/h)	32			23			471	
C (m) (veh/h)	1030			690			785	
v/c	0.03			0.03			0.60	
95% queue length	0.10			0.10			4.08	
Control Delay (s/veh)	8.6			10.4			16.2	
LOS	A			B			C	
Approach Delay (s/veh)	--	--	10.4			16.2		
Approach LOS	--	--	B			C		

TWO-WAY STOP CONTROL SUMMARY

General Information			Site Information	
Analyst	JMV		Intersection	Park Avenue & I-80 EB Ramps
Agency/Co.	L&V Engineering		Jurisdiction	
Date Performed	6/18/2013		Analysis Year	Existing 2013
Analysis Time Period	P.M. Peak Hour			

Project Description *Interstate 80 Reconstruction*

East/West Street: *I-80 EB Ramps/Barry Street*

North/South Street: *Park Avenue (SR 611)*

Intersection Orientation: *North-South*

Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	21	157			198	116
Peak-Hour Factor, PHF	0.66	0.79	1.00	1.00	0.75	0.60
Hourly Flow Rate, HFR (veh/h)	31	198	0	0	264	193
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	200		144	6	3	10
Peak-Hour Factor, PHF	0.83	1.00	0.78	0.50	0.38	0.63
Hourly Flow Rate, HFR (veh/h)	240	0	184	12	7	15
Percent Heavy Vehicles	1	0	3	0	0	10
Percent Grade (%)	-1			-3		
Flared Approach		Y			N	
Storage		1			0	
RT Channelized			0			0
Lanes	0	0	0	0	1	0
Configuration		LR			LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LTR			LR	
v (veh/h)	31			34			424	
C (m) (veh/h)	836			461			601	
v/c	0.04			0.07			0.71	
95% queue length	0.12			0.24			5.71	
Control Delay (s/veh)	9.5			13.4			24.1	
LOS	A			B			C	
Approach Delay (s/veh)	--	--	13.4			24.1		
Approach LOS	--	--	B			C		

**Two-Way Stop Controlled Intersection Level of Service Calculations
Interchange 307 Park Avenue (SR 611) and I-80 Eastbound Ramps
Existing Year 2013**

A.M. Peak Hour

Movement	Volume	Delay
Park Avenue NB left	27	8.6
Park Avenue NB thru	109	8.6
Park Avenue SB thru	68	0
Park Avenue SB right	82	0
I-80 EB Off Ramp EB left	274	16.2
I-80 EB Off Ramp EB right	107	16.2
Barry Street WB left	0	10.4
Barry Street WB thru	7	10.4
Barry Street WB right	8	10.4
Overall	682	11.0
LOS		B

P.M. Peak Hour

Movement	Volume	Delay
Park Avenue NB left	21	9.5
Park Avenue NB thru	157	9.5
Park Avenue SB thru	198	0
Park Avenue SB right	116	0
I-80 EB Off Ramp EB left	200	24.1
I-80 EB Off Ramp EB right	144	24.1
Barry Street WB left	6	13.4
Barry Street WB thru	3	13.4
Barry Street WB right	10	13.4
Overall	855	12.0
LOS		B

TWO-WAY STOP CONTROL SUMMARY

General Information			Site Information	
Analyst	JMV		Intersection	Broad Street & I-80 WB Ramps
Agency/Co.	L&V Engineering		Jurisdiction	
Date Performed	6/18/2013		Analysis Year	Existing 2013
Analysis Time Period	A.M. Peak Hour			

Project Description *Interstate 80 Reconstruction*

East/West Street: *I-80 WB Ramps*

North/South Street: *Broad Street (SR 191)*

Intersection Orientation: *North-South*

Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	94	389			116	157
Peak-Hour Factor, PHF	0.78	0.78	1.00	1.00	0.88	0.84
Hourly Flow Rate, HFR (veh/h)	120	498	0	0	131	186
Percent Heavy Vehicles	2	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				40		151
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.83	1.00	0.88
Hourly Flow Rate, HFR (veh/h)	0	0	0	48	0	171
Percent Heavy Vehicles	0	0	0	3	0	3
Percent Grade (%)	0			-1		
Flared Approach		N			Y	
Storage		0			2	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LR				
v (veh/h)	120			219				
C (m) (veh/h)	925			777				
v/c	0.13			0.28				
95% queue length	0.45			1.16				
Control Delay (s/veh)	9.5			14.8				
LOS	A			B				
Approach Delay (s/veh)	--	--	14.8					
Approach LOS	--	--	B					

TWO-WAY STOP CONTROL SUMMARY

General Information			Site Information	
Analyst	JMV		Intersection	Broad Street & I-80 WB Ramps
Agency/Co.	L&V Engineering		Jurisdiction	
Date Performed	6/18/2013		Analysis Year	Existing 2013
Analysis Time Period	P.M. Peak Hour			

Project Description *Interstate 80 Reconstruction*

East/West Street: *I-80 WB Ramps*

North/South Street: *Broad Street (SR 191)*

Intersection Orientation: *North-South*

Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	159	327			289	260
Peak-Hour Factor, PHF	0.72	0.92	1.00	1.00	0.94	0.83
Hourly Flow Rate, HFR (veh/h)	220	355	0	0	307	313
Percent Heavy Vehicles	1	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				63		234
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.79	1.00	0.91
Hourly Flow Rate, HFR (veh/h)	0	0	0	79	0	257
Percent Heavy Vehicles	0	0	0	3	0	1
Percent Grade (%)	0			-1		
Flared Approach		N			Y	
Storage		0			2	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT			LR				
v (veh/h)	220			336				
C (m) (veh/h)	727			646				
v/c	0.30			0.52				
95% queue length	1.28			3.02				
Control Delay (s/veh)	12.1			21.8				
LOS	B			C				
Approach Delay (s/veh)	--	--	21.8					
Approach LOS	--	--	C					

**Two-Way Stop Controlled Intersection Level of Service Calculations
Interchange 307 Broad Street (SR 191) and I-80 Westbound Ramps
Existing Year 2013**

A.M. Peak Hour

Movement	Volume	Delay
Broad Street NB left	94	9.5
Broad Street NB thru	389	9.5
Broad Street SB thru	116	0
Broad Street SB right	157	0
I-80 WB Off Ramp WB left	40	14.8
I-80 WB Off Ramp WB right	151	14.8
Overall	947	7.8
LOS		A

P.M. Peak Hour












Movement	Volume	Delay
Broad Street NB left	159	12.1
Broad Street NB thru	327	12.1
Broad Street SB thru	289	0
Broad Street SB right	260	0
I-80 WB Off Ramp WB left	63	21.8
I-80 WB Off Ramp WB right	234	21.8
Overall	1332	9.3
LOS		A

SIGNALIZED INTERSECTION HCS ANALYSIS

Lanes, Volumes, Timings
1: Shafers School House Rd & SR 611







Stroud Twp. System 1 A.M. Peak Hour

Existing Year 2013

						
Lane Group	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	617	47	30	423	36	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	10	14
Grade (%)	2%			-1%	4%	
Storage Length (ft)		0	150		0	165
Storage Lanes		0	1		1	1
Taper Length (ft)			100		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.991					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1689	0	1639	1758	1603	1593
Flt Permitted			0.340		0.950	
Satd. Flow (perm)	1689	0	587	1758	1603	1593
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	13					47
Link Speed (mph)	45			45	30	
Link Distance (ft)	1000			1522	500	
Travel Time (s)	15.2			23.1	11.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.89	0.92	0.78	0.88	0.71	0.73
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	43%	7%	5%	3%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	693	51	38	481	51	47
Shared Lane Traffic (%)						
Lane Group Flow (vph)	744	0	38	481	51	47
Turn Type	NA		Perm	NA	NA	Perm
Protected Phases	2			6	8	
Permitted Phases			6			8
Detector Phase	2		6	6	8	8
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	13.0		13.0	13.0	13.0	13.0
Total Split (s)	70.0		70.0	70.0	15.0	15.0
Total Split (%)	82.4%		82.4%	82.4%	17.6%	17.6%
Maximum Green (s)	64.0		64.0	64.0	9.0	9.0
Yellow Time (s)	4.5		4.5	4.5	3.5	3.5
All-Red Time (s)	1.5		1.5	1.5	2.5	2.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	5.5		5.5	5.5	3.0	3.0
Minimum Gap (s)	2.5		2.5	2.5	0.2	0.2

Lanes, Volumes, Timings
1: Shafers School House Rd & SR 611

Stroud Twp. System 1 A.M. Peak Hour
Existing Year 2013

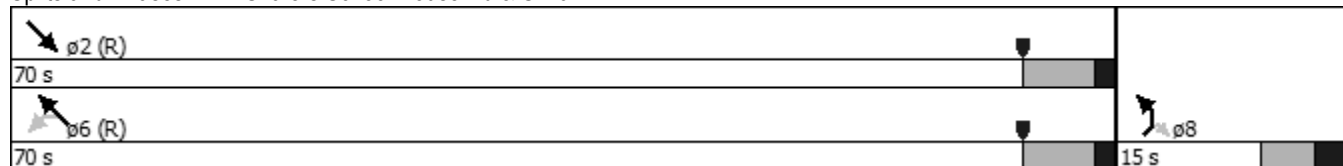
						
Lane Group	SET	SER	NWL	NWT	NEL	NER
Time Before Reduce (s)	15.0		15.0	15.0	0.0	0.0
Time To Reduce (s)	14.0		14.0	14.0	0.0	0.0
Recall Mode	C-Min		C-Min	C-Min	None	None
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
Act Effct Green (s)	68.3		68.3	68.3	8.2	8.2
Actuated g/C Ratio	0.80		0.80	0.80	0.10	0.10
v/c Ratio	0.55		0.08	0.34	0.33	0.24
Control Delay	6.0		3.4	3.8	40.9	13.9
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	6.0		3.4	3.8	40.9	13.9
LOS	A		A	A	D	B
Approach Delay	6.0			3.8	28.0	
Approach LOS	A			A	C	
Queue Length 50th (ft)	128		4	60	26	0
Queue Length 95th (ft)	237		10	101	45	20
Internal Link Dist (ft)	920			1442	420	
Turn Bay Length (ft)			150			165
Base Capacity (vph)	1369		475	1423	178	219
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.54		0.08	0.34	0.29	0.21

Intersection Summary

Area Type: Other
 Cycle Length: 85
 Actuated Cycle Length: 85
 Offset: 19 (22%), Referenced to phase 2:SET and 6:NWTL, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.55
 Intersection Signal Delay: 6.8
 Intersection Capacity Utilization 48.7%
 Analysis Period (min) 15












Intersection LOS: A
ICU Level of Service A

Splits and Phases: 1: Shafers School House Rd & SR 611






















HCM 2010 Signalized Intersection Summary
1: Shafers School House Rd & SR 611

Stroud Twp. System 1 A.M. Peak Hour
Existing Year 2013

						
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	617	47	30	423	36	34
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	176.3	188.1	178.5	181.9	180.8	182.7
Lanes	1	0	1	1	1	1
Cap, veh/h	1143	84	473	1281	102	92
Arrive On Green	0.70	0.70	0.70	0.70	0.06	0.06
Sat Flow, veh/h	1623	119	683	1819	1722	1553
Grp Volume(v), veh/h	0	744	38	481	51	47
Grp Sat Flow(s),veh/h/ln	0	1742	683	1819	1722	1553
Q Serve(g_s), s	0.0	11.2	1.5	5.4	1.5	1.5
Cycle Q Clear(g_c), s	0.0	11.2	12.7	5.4	1.5	1.5
Prop In Lane		0.07	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	0	1227	473	1281	102	92
V/C Ratio(X)	0.00	0.61	0.08	0.38	0.50	0.51
Avail Cap(c_a), veh/h	0	2200	854	2297	306	276
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.98	0.98	1.00	1.00
Uniform Delay (d), s/veh	0.0	3.9	7.2	3.0	23.1	23.1
Incr Delay (d2), s/veh	0.0	2.2	0.3	0.8	3.8	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.0	2.8	0.2	1.4	0.7	0.7
Lane Grp Delay (d), s/veh	0.0	6.1	7.5	3.8	26.9	27.5
Lane Grp LOS		A	A	A	C	C
Approach Vol, veh/h	744			519	98	
Approach Delay, s/veh	6.1			4.1	27.2	
Approach LOS	A			A	C	
Timer						
Assigned Phs	2			6		
Phs Duration (G+Y+Rc), s	41.7			41.7		
Change Period (Y+Rc), s	6.0			6.0		
Max Green Setting (Gmax), s	64.0			64.0		
Max Q Clear Time (g_c+l1), s	13.2			14.7		
Green Ext Time (p_c), s	21.2			21.0		
Intersection Summary						
HCM 2010 Ctrl Delay			6.9			
HCM 2010 LOS			A			
Notes						













Lanes, Volumes, Timings
2: Applegate Rd/Terrace Dr & SR 611

Stroud Twp. System 1 A.M. Peak Hour
Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	523	25	14	286	6	16	1	21	16	3	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	11	10	11	11	11	13	13	10	10	10
Grade (%)		1%			1%			2%			-4%	
Storage Length (ft)	75		0	75		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	90			90			50			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00										
Frt		0.990			0.995			0.866			0.928	
Flt Protected	0.950			0.950			0.950				0.983	
Satd. Flow (prot)	1581	1753	0	1676	1719	0	1727	1683	0	0	1610	0
Flt Permitted	0.556			0.380			0.711				0.868	
Satd. Flow (perm)	926	1753	0	670	1719	0	1293	1683	0	0	1422	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			5			33			38	
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		1522			906			500			500	
Travel Time (s)		23.1			13.7			13.6			13.6	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)			2									
Peak Hour Factor	0.50	0.85	0.60	0.65	0.87	0.50	0.94	0.25	0.63	0.63	0.38	0.50
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	3%	4%	0%	6%	0%	0%	0%	0%	7%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	34	615	42	22	329	12	17	4	33	25	8	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	657	0	22	341	0	17	37	0	0	71	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	13.5	13.5		13.5	13.5		14.5	14.5		14.5	14.5	
Total Split (s)	65.0	65.0		65.0	65.0		20.0	20.0		20.0	20.0	
Total Split (%)	76.5%	76.5%		76.5%	76.5%		23.5%	23.5%		23.5%	23.5%	
Maximum Green (s)	58.5	58.5		58.5	58.5		12.5	12.5		12.5	12.5	
Yellow Time (s)	4.5	4.5		4.5	4.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.5	6.5		6.5	6.5		7.5	7.5			7.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	6.0	6.0		6.0	6.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		0.2	0.2		0.2	0.2	

Lanes, Volumes, Timings
2: Applegate Rd/Terrace Dr & SR 611

Stroud Twp. System 1 A.M. Peak Hour
Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	25.0	25.0		25.0	25.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	10.0	10.0		10.0	10.0		0.0	0.0		0.0	0.0	
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	67.0	67.0		67.0	67.0		7.9	7.9				7.9
Actuated g/C Ratio	0.79	0.79		0.79	0.79		0.09	0.09				0.09
v/c Ratio	0.05	0.47		0.04	0.25		0.14	0.20				0.43
Control Delay	1.5	2.1		2.6	2.3		36.6	16.5				27.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0				0.0
Total Delay	1.5	2.1		2.6	2.3		36.6	16.5				27.8
LOS	A	A		A	A		D	B				C
Approach Delay		2.1			2.3			22.8				27.8
Approach LOS		A			A			C				C
Queue Length 50th (ft)	0	7		1	13		9	2				17
Queue Length 95th (ft)	4	57		4	42		27	0				11
Internal Link Dist (ft)		1442			826			420				420
Turn Bay Length (ft)	75			75			75					
Base Capacity (vph)	730	1384		528	1356		190	275				241
Starvation Cap Reductn	0	0		0	0		0	0				0
Spillback Cap Reductn	0	0		0	0		0	0				0
Storage Cap Reductn	0	0		0	0		0	0				0
Reduced v/c Ratio	0.05	0.47		0.04	0.25		0.09	0.13				0.29

Intersection Summary

Area Type: Other

Cycle Length: 85

Actuated Cycle Length: 85

Offset: 35 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.47

Intersection Signal Delay: 4.7





Intersection Capacity Utilization 49.6%

Analysis Period (min) 15

Intersection LOS: A

ICU Level of Service A




















Splits and Phases: 2: Applegate Rd/Terrace Dr & SR 611

 ø2 (R)		 ø4
65 s		20 s
 ø6 (R)		 ø8
65 s		20 s

HCM 2010 Signalized Intersection Summary













2: Applegate Rd/Terrace Dr & SR 611

Stroud Twp. System 1 A.M. Peak Hour
Existing Year 2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	17	523	25	14	286	6	16	1	21	16	3	19
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	178.3	183.4	189.0	189.0	178.7	189.0	188.1	195.6	195.6	193.8	189.1	193.8
Lanes	1	1	0	1	1	0	1	1	0	0	1	0
Cap, veh/h	684	1069	73	476	1081	39	198	16	130	134	24	68
Arrive On Green	0.63	0.63	0.63	0.63	0.63	0.63	0.09	0.09	0.09	0.09	0.09	0.09
Sat Flow, veh/h	991	1695	116	785	1714	62	1368	183	1507	415	274	793
Grp Volume(v), veh/h	34	0	657	22	0	341	17	0	37	71	0	0
Grp Sat Flow(s),veh/h/ln	991	0	1811	785	0	1776	1368	0	1690	1482	0	0
Q Serve(g_s), s	0.8	0.0	10.4	0.8	0.0	4.3	0.6	0.0	1.0	1.3	0.0	0.0
Cycle Q Clear(g_c), s	5.1	0.0	10.4	11.2	0.0	4.3	3.0	0.0	1.0	2.4	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.04	1.00		0.89	0.35		0.54
Lane Grp Cap(c), veh/h	684	0	1143	476	0	1120	198	0	146	226	0	0
V/C Ratio(X)	0.05	0.00	0.58	0.05	0.00	0.30	0.09	0.00	0.25	0.31	0.00	0.00
Avail Cap(c_a), veh/h	1231	0	2141	909	0	2100	426	0	427	484	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.00	0.83	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	5.3	0.0	5.3	8.5	0.0	4.2	23.2	0.0	21.1	21.7	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	1.8	0.2	0.0	0.7	0.2	0.0	0.9	0.8	0.0	0.0
Initial Q Delay(d3),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
%ile Back of Q (50%), veh/ln	0.2	0.0	3.3	0.1	0.0	1.4	0.2	0.0	0.4	0.9	0.0	0.0
Lane Grp Delay (d), s/veh	5.5	0.0	7.1	8.7	0.0	4.9	23.4	0.0	22.0	22.5	0.0	0.0
Lane Grp LOS	A		A	A		A	C		C	C		
Approach Vol, veh/h		691			363			54			71	
Approach Delay, s/veh		7.0			5.1			22.4			22.5	
Approach LOS		A			A			C			C	
Timer												
Assigned Phs		2			6			8			4	
Phs Duration (G+Y+Rc), s		37.7			37.7			11.8			11.8	
Change Period (Y+Rc), s		6.5			6.5			7.5			7.5	
Max Green Setting (Gmax), s		58.5			58.5			12.5			12.5	
Max Q Clear Time (g_c+l1), s		12.4			13.2			5.0			4.4	
Green Ext Time (p_c), s		18.1			18.0			0.2			0.2	
Intersection Summary												
HCM 2010 Ctrl Delay			8.0									
HCM 2010 LOS			A									
Notes												







Lanes, Volumes, Timings
3: SR 611 & Pocono Commons Dr

Stroud Twp. System 1 A.M. Peak Hour
Existing Year 2013

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	185	334	278	151	75	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	14	13	16
Grade (%)		-1%	1%		-2%	
Storage Length (ft)	175			280	0	150
Storage Lanes	1			1	2	1
Taper Length (ft)	90				25	
Lane Util. Factor	0.97	1.00	1.00	1.00	0.97	1.00
Ped Bike Factor						
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3417	1768	1800	1697	3514	1761
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3417	1768	1800	1697	3514	1761
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				199		161
Link Speed (mph)		45	45		25	
Link Distance (ft)		340	1000		500	
Travel Time (s)		5.2	15.2		13.6	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.87	0.91	0.89	0.76	0.74	0.89
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	8%	5%	1%	4%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	213	367	312	199	101	161
Shared Lane Traffic (%)						
Lane Group Flow (vph)	213	367	312	199	101	161
Turn Type	Prot	NA	NA	Perm	NA	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	13.5	13.5	13.5	13.5	13.0	13.0
Total Split (s)	21.0	64.0	43.0	43.0	21.0	21.0
Total Split (%)	24.7%	75.3%	50.6%	50.6%	24.7%	24.7%
Maximum Green (s)	14.5	57.5	36.5	36.5	15.0	15.0
Yellow Time (s)	5.0	5.0	5.0	5.0	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0	5.5	5.5	5.5	2.0	2.0
Minimum Gap (s)	0.2	2.5	2.5	2.5	0.2	0.2

Lanes, Volumes, Timings
3: SR 611 & Pocono Commons Dr

Stroud Twp. System 1 A.M. Peak Hour
Existing Year 2013





						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Time Before Reduce (s)	0.0	15.0	15.0	15.0	0.0	0.0
Time To Reduce (s)	0.0	14.0	14.0	14.0	0.0	0.0
Recall Mode	None	C-Min	C-Min	C-Min	None	None
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
Act Effect Green (s)	9.6	65.4	49.3	49.3	7.1	7.1
Actuated g/C Ratio	0.11	0.77	0.58	0.58	0.08	0.08
v/c Ratio	0.55	0.27	0.30	0.19	0.35	0.55
Control Delay	36.0	4.6	10.9	2.1	39.4	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.0	4.6	10.9	2.1	39.4	13.8
LOS	D	A	B	A	D	B
Approach Delay		16.1	7.5		23.6	
Approach LOS		B	A		C	
Queue Length 50th (ft)	56	42	77	0	26	0
Queue Length 95th (ft)	85	141	147	17	40	52
Internal Link Dist (ft)		260	920		420	
Turn Bay Length (ft)	175			280		150
Base Capacity (vph)	582	1360	1043	1067	620	443
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.27	0.30	0.19	0.16	0.36

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 85
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.55
Intersection Signal Delay: 14.3
Intersection Capacity Utilization 39.1%
Analysis Period (min) 15

Intersection LOS: B
ICU Level of Service A













Splits and Phases: 3: SR 611 & Pocono Commons Dr

 ø2 (R)	 ø4
64 s	21 s
 ø5	 ø6 (R)
21 s	43 s

HCM 2010 Signalized Intersection Summary

3: SR 611 & Pocono Commons Dr












Stroud Twp. System 1 A.M. Peak Hour
Existing Year 2013

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	185	334	278	151	75	143
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	185.4	176.8	180.0	194.7	191.9	190.1
Lanes	2	1	1	1	2	1
Cap, veh/h	364	1110	654	601	237	108
Arrive On Green	0.11	0.63	0.36	0.00	0.07	0.00
Sat Flow, veh/h	3425	1768	1800	1655	3546	1616
Grp Volume(v), veh/h	213	367	312	0	101	0
Grp Sat Flow(s),veh/h/ln	1713	1768	1800	1655	1773	1616
Q Serve(g_s), s	2.4	4.0	5.5	0.0	1.1	0.0
Cycle Q Clear(g_c), s	2.4	4.0	5.5	0.0	1.1	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	364	1110	654	601	237	108
V/C Ratio(X)	0.59	0.33	0.48	0.00	0.43	0.00
Avail Cap(c_a), veh/h	1213	2482	1605	1475	1299	592
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	17.4	3.6	10.0	0.0	18.4	0.0
Incr Delay (d2), s/veh	0.6	0.8	2.5	0.0	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.9	1.1	2.3	0.0	0.5	0.0
Lane Grp Delay (d), s/veh	18.0	4.4	12.5	0.0	18.8	0.0
Lane Grp LOS	B	A	B		B	
Approach Vol, veh/h		580	312		101	
Approach Delay, s/veh		9.4	12.5		18.8	
Approach LOS		A	B		B	
Timer						
Assigned Phs	5	2	6			
Phs Duration (G+Y+Rc), s	10.9	32.2	21.4			
Change Period (Y+Rc), s	6.5	6.5	6.5			
Max Green Setting (Gmax), s	14.5	57.5	36.5			
Max Q Clear Time (g_c+I1), s	4.4	6.0	7.5			
Green Ext Time (p_c), s	0.3	8.3	7.4			
Intersection Summary						
HCM 2010 Ctrl Delay			11.3			
HCM 2010 LOS			B			
Notes						

Lanes, Volumes, Timings
1: Shafers School House Rd & SR 611

Stroud Twp. System 1 P.M. Peak Hour







Existing Year 2013

						
Lane Group	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	617	39	70	753	42	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	10	14
Grade (%)	2%			-1%	4%	
Storage Length (ft)		0	150		0	165
Storage Lanes		0	1		1	1
Taper Length (ft)			100		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.989					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1720	0	1624	1810	1603	1563
Flt Permitted			0.358		0.950	
Satd. Flow (perm)	1720	0	612	1810	1603	1563
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	14					51
Link Speed (mph)	45			45	30	
Link Distance (ft)	1000			1522	500	
Travel Time (s)	15.2			23.1	11.4	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.94	0.66	0.87	0.88	0.71	0.83
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	22%	8%	2%	3%	8%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	656	59	80	856	59	51
Shared Lane Traffic (%)						
Lane Group Flow (vph)	715	0	80	856	59	51
Turn Type	NA		Perm	NA	NA	Perm
Protected Phases	2			6	8	
Permitted Phases			6			8
Detector Phase	2		6	6	8	8
Switch Phase						
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	13.0		13.0	13.0	13.0	13.0
Total Split (s)	83.0		83.0	83.0	17.0	17.0
Total Split (%)	83.0%		83.0%	83.0%	17.0%	17.0%
Maximum Green (s)	77.0		77.0	77.0	11.0	11.0
Yellow Time (s)	4.5		4.5	4.5	3.5	3.5
All-Red Time (s)	1.5		1.5	1.5	2.5	2.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	5.5		5.5	5.5	3.0	3.0
Minimum Gap (s)	2.5		2.5	2.5	0.2	0.2

Lanes, Volumes, Timings
1: Shafers School House Rd & SR 611

Stroud Twp. System 1 P.M. Peak Hour

Existing Year 2013

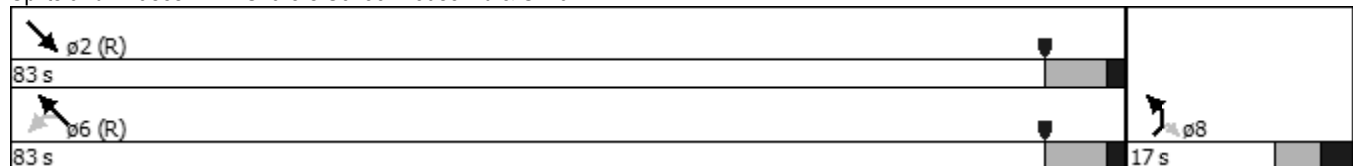
						
Lane Group	SET	SER	NWL	NWT	NEL	NER
Time Before Reduce (s)	15.0		15.0	15.0	0.0	0.0
Time To Reduce (s)	14.0		14.0	14.0	0.0	0.0
Recall Mode	C-Min		C-Min	C-Min	None	None
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
Act Effect Green (s)	82.5		82.5	82.5	9.0	9.0
Actuated g/C Ratio	0.82		0.82	0.82	0.09	0.09
v/c Ratio	0.50		0.16	0.57	0.41	0.27
Control Delay	5.2		2.2	3.4	50.5	15.4
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	5.2		2.2	3.4	50.5	15.4
LOS	A		A	A	D	B
Approach Delay	5.2			3.3	34.2	
Approach LOS	A			A	C	
Queue Length 50th (ft)	124		5	71	36	0
Queue Length 95th (ft)	229		12	83	58	29
Internal Link Dist (ft)	920			1442	420	
Turn Bay Length (ft)			150			165
Base Capacity (vph)	1426		506	1498	181	222
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.50		0.16	0.57	0.33	0.23

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 89 (89%), Referenced to phase 2:SET and 6:NWTL, Start of Yellow
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 6.0
Intersection Capacity Utilization 57.0%
Analysis Period (min) 15

Intersection LOS: A
ICU Level of Service B












Splits and Phases: 1: Shafers School House Rd & SR 611



HCM 2010 Signalized Intersection Summary
1: Shafers School House Rd & SR 611




















Stroud Twp. System 1 P.M. Peak Hour

Existing Year 2013

						
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	617	39	70	753	42	42
Number	2	12	1	6	3	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	179.9	188.1	176.8	187.2	180.8	179.3
Lanes	1	0	1	1	1	1
Cap, veh/h	1242	112	527	1429	99	87
Arrive On Green	0.76	0.76	0.76	0.76	0.06	0.06
Sat Flow, veh/h	1627	146	696	1872	1722	1524
Grp Volume(v), veh/h	0	715	80	856	59	51
Grp Sat Flow(s),veh/h/ln	0	1773	696	1872	1722	1524
Q Serve(g_s), s	0.0	10.7	3.4	13.3	2.2	2.2
Cycle Q Clear(g_c), s	0.0	10.7	14.2	13.3	2.2	2.2
Prop In Lane		0.08	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	0	1353	527	1429	99	87
V/C Ratio(X)	0.00	0.53	0.15	0.60	0.60	0.58
Avail Cap(c_a), veh/h	0	2040	797	2154	283	250
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.84	0.84	1.00	1.00
Uniform Delay (d), s/veh	0.0	3.1	5.9	3.5	30.8	30.8
Incr Delay (d2), s/veh	0.0	1.5	0.5	1.6	5.7	6.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.0	2.7	0.5	3.5	1.1	1.0
Lane Grp Delay (d), s/veh	0.0	4.6	6.5	5.0	36.5	36.8
Lane Grp LOS		A	A	A	D	D
Approach Vol, veh/h	715			936	110	
Approach Delay, s/veh	4.6			5.1	36.6	
Approach LOS	A			A	D	
Timer						
Assigned Phs	2			6		
Phs Duration (G+Y+Rc), s	57.1			57.1		
Change Period (Y+Rc), s	6.0			6.0		
Max Green Setting (Gmax), s	77.0			77.0		
Max Q Clear Time (g_c+l1), s	12.7			16.2		
Green Ext Time (p_c), s	36.0			34.9		
Intersection Summary						
HCM 2010 Ctrl Delay			6.9			
HCM 2010 LOS			A			
Notes						













Lanes, Volumes, Timings
2: Applegate Rd/Terrace Dr & SR 611

Stroud Twp. System 1 P.M. Peak Hour
Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	573	31	31	704	14	36	3	32	8	2	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	11	11	10	11	11	11	13	13	10	10	10
Grade (%)		1%			1%			2%			-4%	
Storage Length (ft)	75		0	75		0	75		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	90			90			50			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.991			0.996			0.883			0.903	
Flt Protected	0.950			0.950			0.950				0.990	
Satd. Flow (prot)	1676	1794	0	1676	1803	0	1727	1677	0	0	1572	0
Flt Permitted	0.325			0.376			0.720				0.912	
Satd. Flow (perm)	573	1794	0	663	1803	0	1309	1677	0	0	1448	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			4			43			41	
Link Speed (mph)		45			45			25			25	
Link Distance (ft)		1522			906			500			500	
Travel Time (s)		23.1			13.7			13.6			13.6	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.82	0.91	0.81	0.66	0.94	0.65	0.71	0.25	0.75	0.67	0.50	0.58
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	3%	0%	0%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	29	630	38	47	749	22	51	12	43	12	4	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	668	0	47	771	0	51	55	0	0	57	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	13.5	13.5		13.5	13.5		14.5	14.5		14.5	14.5	
Total Split (s)	80.0	80.0		80.0	80.0		20.0	20.0		20.0	20.0	
Total Split (%)	80.0%	80.0%		80.0%	80.0%		20.0%	20.0%		20.0%	20.0%	
Maximum Green (s)	73.5	73.5		73.5	73.5		12.5	12.5		12.5	12.5	
Yellow Time (s)	4.5	4.5		4.5	4.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	2.0	2.0		2.0	2.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.5	6.5		6.5	6.5		7.5	7.5			7.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	6.0	6.0		6.0	6.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		0.2	0.2		0.2	0.2	

Lanes, Volumes, Timings
2: Applegate Rd/Terrace Dr & SR 611





Stroud Twp. System 1 P.M. Peak Hour
Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	25.0	25.0		25.0	25.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	10.0	10.0		10.0	10.0		0.0	0.0		0.0	0.0	
Recall Mode	C-Min	C-Min		C-Min	C-Min		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	80.6	80.6		80.6	80.6		9.3	9.3				9.3
Actuated g/C Ratio	0.81	0.81		0.81	0.81		0.09	0.09				0.09
v/c Ratio	0.06	0.46		0.09	0.53		0.42	0.28				0.33
Control Delay	3.8	5.2		2.0	2.8		52.3	20.3				23.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0				0.0
Total Delay	3.8	5.2		2.0	2.8		52.3	20.3				23.4
LOS	A	A		A	A		D	C				C
Approach Delay		5.2			2.8			35.7				23.4
Approach LOS		A			A			D				C
Queue Length 50th (ft)	4	126		2	36		31	7				10
Queue Length 95th (ft)	m9	211		m4	67		52	0				14
Internal Link Dist (ft)		1442			826			420				420
Turn Bay Length (ft)	75			75			75					
Base Capacity (vph)	463	1450		535	1457		165	250				218
Starvation Cap Reductn	0	0		0	0		0	0				0
Spillback Cap Reductn	0	0		0	0		0	0				0
Storage Cap Reductn	0	0		0	0		0	0				0
Reduced v/c Ratio	0.06	0.46		0.09	0.53		0.31	0.22				0.26

Intersection Summary




















Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 67 (67%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.53
Intersection Signal Delay: 6.5
Intersection Capacity Utilization 58.3%
Analysis Period (min) 15
Intersection LOS: A
ICU Level of Service B
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Applegate Rd/Terrace Dr & SR 611

 ø2 (R)		 ø4
80 s		20 s
 ø6 (R)		 ø8
80 s		20 s













HCM 2010 Signalized Intersection Summary
2: Applegate Rd/Terrace Dr & SR 611

Stroud Twp. System 1 P.M. Peak Hour
Existing Year 2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	24	573	31	31	704	14	36	3	32	8	2	24
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	189.0	187.3	189.0	189.0	187.2	189.0	188.1	191.1	195.6	193.8	188.4	193.8
Lanes	1	1	0	1	1	0	1	1	0	0	1	0
Cap, veh/h	456	1241	75	525	1285	38	187	35	126	79	25	111
Arrive On Green	0.71	0.71	0.71	0.71	0.71	0.71	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	706	1749	105	777	1810	53	1369	366	1313	192	259	1155
Grp Volume(v), veh/h	29	0	668	47	0	771	51	0	55	57	0	0
Grp Sat Flow(s),veh/h/ln	706	0	1854	777	0	1863	1369	0	1680	1606	0	0
Q Serve(g_s), s	1.5	0.0	11.8	2.1	0.0	14.8	2.6	0.0	2.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	16.3	0.0	11.8	13.9	0.0	14.8	4.9	0.0	2.2	2.3	0.0	0.0
Prop In Lane	1.00		0.06	1.00		0.03	1.00		0.78	0.21		0.72
Lane Grp Cap(c), veh/h	456	0	1316	525	0	1323	187	0	161	214	0	0
V/C Ratio(X)	0.06	0.00	0.51	0.09	0.00	0.58	0.27	0.00	0.34	0.27	0.00	0.00
Avail Cap(c_a), veh/h	675	0	1891	766	0	1900	294	0	291	335	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.87	0.00	0.87	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.2	0.0	4.7	7.9	0.0	5.2	32.8	0.0	30.5	30.5	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	1.2	0.3	0.0	1.9	0.8	0.0	1.3	0.7	0.0	0.0
Initial Q Delay(d3),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
%ile Back of Q (50%), veh/ln	0.3	0.0	3.8	0.4	0.0	5.0	0.9	0.0	1.0	1.0	0.0	0.0
Lane Grp Delay (d), s/veh	9.4	0.0	6.0	8.2	0.0	7.1	33.6	0.0	31.7	31.2	0.0	0.0
Lane Grp LOS	A		A	A		A	C		C	C		
Approach Vol, veh/h		697			818			106			57	
Approach Delay, s/veh		6.1			7.1			32.6			31.2	
Approach LOS		A			A			C			C	
Timer												
Assigned Phs		2			6			8			4	
Phs Duration (G+Y+Rc), s		57.7			57.7			14.4			14.4	
Change Period (Y+Rc), s		6.5			6.5			7.5			7.5	
Max Green Setting (Gmax), s		73.5			73.5			12.5			12.5	
Max Q Clear Time (g_c+l1), s		18.3			16.8			6.9			4.3	
Green Ext Time (p_c), s		32.9			33.4			0.3			0.4	
Intersection Summary												
HCM 2010 Ctrl Delay			9.1									
HCM 2010 LOS			A									
Notes												







Lanes, Volumes, Timings
3: SR 611 & Pocono Commons Dr

Stroud Twp. System 1 P.M. Peak Hour
Existing Year 2013

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	274	325	567	217	186	337
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	14	13	16
Grade (%)		-1%	1%		-2%	
Storage Length (ft)	175			280	0	150
Storage Lanes	1			1	2	1
Taper Length (ft)	90				25	
Lane Util. Factor	0.97	1.00	1.00	1.00	0.97	1.00
Ped Bike Factor						
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3484	1872	1872	1697	3583	1812
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3484	1872	1872	1697	3583	1812
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				241		387
Link Speed (mph)		45	45		25	
Link Distance (ft)		340	1000		500	
Travel Time (s)		5.2	15.2		13.6	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.74	0.89	0.85	0.90	0.83	0.70
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	2%	1%	1%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	370	365	667	241	224	481
Shared Lane Traffic (%)						
Lane Group Flow (vph)	370	365	667	241	224	481
Turn Type	Prot	NA	NA	Perm	NA	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	13.5	13.5	13.5	13.5	13.0	13.0
Total Split (s)	21.0	75.0	54.0	54.0	25.0	25.0
Total Split (%)	21.0%	75.0%	54.0%	54.0%	25.0%	25.0%
Maximum Green (s)	14.5	68.5	47.5	47.5	19.0	19.0
Yellow Time (s)	5.0	5.0	5.0	5.0	3.5	3.5
All-Red Time (s)	1.5	1.5	1.5	1.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Vehicle Extension (s)	2.0	5.5	5.5	5.5	2.0	2.0
Minimum Gap (s)	0.2	2.5	2.5	2.5	0.2	0.2

Lanes, Volumes, Timings
3: SR 611 & Pocono Commons Dr

Stroud Twp. System 1 P.M. Peak Hour
Existing Year 2013

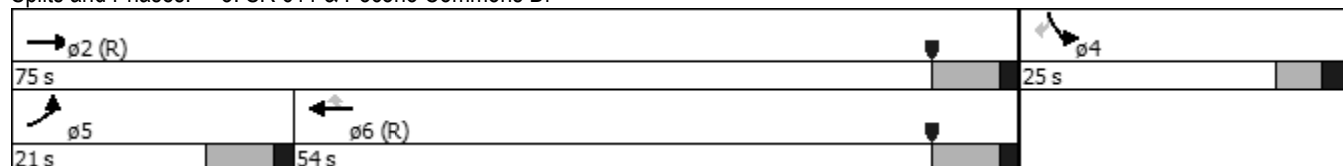
						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Time Before Reduce (s)	0.0	15.0	15.0	15.0	0.0	0.0
Time To Reduce (s)	0.0	14.0	14.0	14.0	0.0	0.0
Recall Mode	None	C-Min	C-Min	C-Min	None	None
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
Act Effect Green (s)	14.0	74.8	54.3	54.3	12.7	12.7
Actuated g/C Ratio	0.14	0.75	0.54	0.54	0.13	0.13
v/c Ratio	0.76	0.26	0.66	0.23	0.49	0.85
Control Delay	46.9	3.8	21.7	2.6	43.5	23.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.9	3.8	21.7	2.6	43.5	23.8
LOS	D	A	C	A	D	C
Approach Delay		25.5	16.6		30.0	
Approach LOS		C	B		C	
Queue Length 50th (ft)	107	16	281	0	71	57
Queue Length 95th (ft)	122	84	436	39	90	56
Internal Link Dist (ft)		260	920		420	
Turn Bay Length (ft)	175			280		150
Base Capacity (vph)	523	1401	1016	1031	680	657
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.26	0.66	0.23	0.33	0.73

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 23.4
Intersection Capacity Utilization 61.1%
Analysis Period (min) 15

Intersection LOS: C
ICU Level of Service B













Splits and Phases: 3: SR 611 & Pocono Commons Dr



HCM 2010 Signalized Intersection Summary

3: SR 611 & Pocono Commons Dr













Stroud Twp. System 1 P.M. Peak Hour
Existing Year 2013

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	274	325	567	217	186	337
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	189.1	187.2	187.2	194.7	195.7	195.7
Lanes	2	1	1	1	2	1
Cap, veh/h	484	1352	915	808	343	158
Arrive On Green	0.14	0.72	0.49	0.00	0.09	0.00
Sat Flow, veh/h	3493	1872	1872	1655	3615	1663
Grp Volume(v), veh/h	370	365	667	0	224	0
Grp Sat Flow(s),veh/h/ln	1747	1872	1872	1655	1808	1663
Q Serve(g_s), s	7.0	4.6	19.3	0.0	4.1	0.0
Cycle Q Clear(g_c), s	7.0	4.6	19.3	0.0	4.1	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	484	1352	915	808	343	158
V/C Ratio(X)	0.76	0.27	0.73	0.00	0.65	0.00
Avail Cap(c_a), veh/h	741	1877	1301	1150	1005	462
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	28.4	3.3	13.9	0.0	29.8	0.0
Incr Delay (d2), s/veh	1.0	0.5	5.1	0.0	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	2.9	1.4	8.7	0.0	1.8	0.0
Lane Grp Delay (d), s/veh	29.3	3.8	19.0	0.0	30.6	0.0
Lane Grp LOS	C	A	B		C	
Approach Vol, veh/h		735	667		224	
Approach Delay, s/veh		16.6	19.0		30.6	
Approach LOS		B	B		C	
Timer						
Assigned Phs	5	2	6			
Phs Duration (G+Y+Rc), s	16.0	55.8	39.9			
Change Period (Y+Rc), s	6.5	6.5	6.5			
Max Green Setting (Gmax), s	14.5	68.5	47.5			
Max Q Clear Time (g_c+I1), s	9.0	6.6	21.3			
Green Ext Time (p_c), s	0.5	16.3	12.0			
Intersection Summary						
HCM 2010 Ctrl Delay			19.5			
HCM 2010 LOS			B			
Notes						

Lanes, Volumes, Timings
1: Bridge St & SR 611

Stroud Twp. System 2 A.M. Peak Hour

Existing Year 2013

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	291	59	169	401	108	201
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	14	11	12
Grade (%)	-3%			3%	8%	
Storage Length (ft)		185	270		0	145
Storage Lanes		1	1		1	1
Taper Length (ft)			85		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1759	1524	1653	1901	1580	1505
Flt Permitted			0.473		0.950	
Satd. Flow (perm)	1759	1524	823	1901	1580	1505
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		88				258
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			629	500	
Travel Time (s)	19.5			12.3	9.7	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.86	0.67	0.92	0.96	0.73	0.78
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	4%	4%	5%	6%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	338	88	184	418	148	258
Shared Lane Traffic (%)						
Lane Group Flow (vph)	338	88	184	418	148	258
Turn Type	NA	pm+ov	pm+pt	NA	NA	Perm
Protected Phases	2	8	1	6	8	
Permitted Phases		2	6			8
Detector Phase	2	8	1	6	8	8
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	13.0
Total Split (s)	48.0	32.0	20.0	68.0	32.0	32.0
Total Split (%)	48.0%	32.0%	20.0%	68.0%	32.0%	32.0%
Maximum Green (s)	42.0	26.0	14.0	62.0	26.0	26.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Vehicle Extension (s)	6.0	3.0	3.0	6.0	3.0	3.0
Minimum Gap (s)	3.0	0.2	0.2	3.0	0.2	0.2

Lanes, Volumes, Timings
1: Bridge St & SR 611

Stroud Twp. System 2 A.M. Peak Hour

Existing Year 2013

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Time Before Reduce (s)	22.0	0.0	0.0	22.0	0.0	0.0
Time To Reduce (s)	11.0	0.0	0.0	11.0	0.0	0.0
Recall Mode	C-Min	None	None	C-Min	None	None
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
Act Effect Green (s)	58.1	78.9	73.2	73.2	14.8	14.8
Actuated g/C Ratio	0.58	0.79	0.73	0.73	0.15	0.15
v/c Ratio	0.33	0.07	0.27	0.30	0.63	0.58
Control Delay	13.4	0.8	2.5	2.1	51.4	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	0.8	2.5	2.1	51.4	10.3
LOS	B	A	A	A	D	B
Approach Delay	10.8			2.3	25.3	
Approach LOS	B			A	C	
Queue Length 50th (ft)	103	0	9	22	90	0
Queue Length 95th (ft)	190	4	19	37	113	35
Internal Link Dist (ft)	920			549	420	
Turn Bay Length (ft)		185	270			145
Base Capacity (vph)	1021	1398	718	1391	410	582
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.06	0.26	0.30	0.36	0.44

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 16 (16%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 50

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 11.3

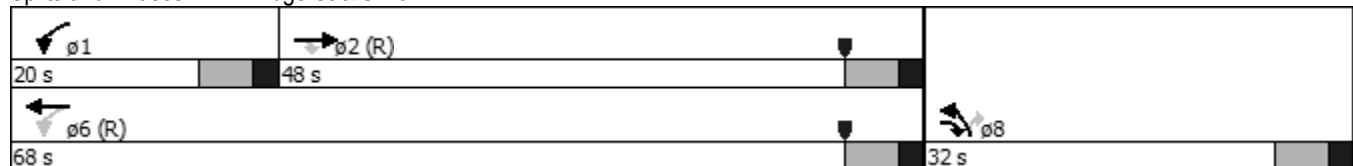
Intersection LOS: B

Intersection Capacity Utilization 45.7%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: Bridge St & SR 611























HCM 2010 analysis expects strict NEMA phasing.

Lanes, Volumes, Timings

Stroud Twp. System 2 A.M. Peak Hour

2: Commercial Driveway/Stroud Mall Main Dr & SR 611

Existing Year 2013













												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	104	656	42	37	516	28	32	12	38	24	3	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	15	16	16	16	16	14	14	15
Grade (%)		0%			0%			-1%			-5%	
Storage Length (ft)	230		0	75		150	0		0	0		125
Storage Lanes	1		0	1		1	0		0	0		1
Taper Length (ft)	80			60			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00								
Frt		0.987				0.850		0.940				0.850
Flt Protected	0.950			0.950				0.980			0.961	
Satd. Flow (prot)	1770	1838	0	1805	1972	1830	0	1967	0	0	1861	1734
Flt Permitted	0.341			0.363				0.848			0.663	
Satd. Flow (perm)	635	1838	0	690	1972	1830	0	1702	0	0	1284	1734
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13				98		34				98
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		629			306			500			500	
Travel Time (s)		12.3			6.0			13.6			13.6	
Confl. Peds. (#/hr)			1	1								
Confl. Bikes (#/hr)												
Peak Hour Factor	0.65	0.90	0.59	0.97	0.90	0.65	0.68	0.69	0.75	0.72	0.38	0.66
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	0%	0%	6%	0%	0%	0%	3%	9%	0%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	160	729	71	38	573	43	47	17	51	33	8	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	160	800	0	38	573	43	0	115	0	0	41	33
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		4
Detector Phase	5	2		6	6	6	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	13.0	13.0		13.0	13.0	13.0	13.0	13.0		13.0	13.0	13.0
Total Split (s)	15.0	79.0		64.0	64.0	64.0	21.0	21.0		21.0	21.0	21.0
Total Split (%)	15.0%	79.0%		64.0%	64.0%	64.0%	21.0%	21.0%		21.0%	21.0%	21.0%
Maximum Green (s)	9.0	73.0		58.0	58.0	58.0	15.0	15.0		15.0	15.0	15.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	0.2		0.2	0.2	0.2	3.0	3.0		3.0	3.0	3.0
Minimum Gap (s)	0.2	0.2		0.2	0.2	0.2	0.2	0.2		0.2	0.2	0.2

Lanes, Volumes, Timings

Stroud Twp. System 2 A.M. Peak Hour

2: Commercial Driveway/Stroud Mall Main Dr & SR 611

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effect Green (s)	77.8	77.8		64.1	64.1	64.1		10.2			10.2	10.2
Actuated g/C Ratio	0.78	0.78		0.64	0.64	0.64		0.10			0.10	0.10
v/c Ratio	0.28	0.56		0.09	0.45	0.04		0.56			0.32	0.12
Control Delay	3.8	5.2		1.4	2.4	0.1		40.0			46.5	1.0
Queue Delay	0.0	0.1		0.0	0.3	0.0		0.0			0.0	0.0
Total Delay	3.8	5.4		1.4	2.7	0.1		40.0			46.5	1.0
LOS	A	A		A	A	A		D			D	A
Approach Delay		5.1			2.4			40.0			26.2	
Approach LOS		A			A			D			C	
Queue Length 50th (ft)	14	90		1	8	0		50			25	0
Queue Length 95th (ft)	25	243		m2	18	1		70			23	0
Internal Link Dist (ft)		549			226			420			420	
Turn Bay Length (ft)	230			75		150						125
Base Capacity (vph)	596	1432		442	1264	1208		284			192	343
Starvation Cap Reductn	0	110		0	213	0		0			0	0
Spillback Cap Reductn	0	0		0	0	0		0			0	0
Storage Cap Reductn	0	0		0	0	0		0			0	0
Reduced v/c Ratio	0.27	0.61		0.09	0.55	0.04		0.40			0.21	0.10

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 7.2

Intersection LOS: A

























Intersection Capacity Utilization 66.8%





















ICU Level of Service C

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.













Splits and Phases: 2: Commercial Driveway/Stroud Mall Main Dr & SR 611

											
79 s										21 s	
											
15 s			64 s							21 s	

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	104	656	42	37	516	28	32	12	38	24	3	22
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	186.3	186.6	190.0	190.0	186.4	197.6	198.6	196.0	198.6	202.5	188.9	192.9
Lanes	1	1	0	1	1	1	0	1	0	0	1	1
Cap, veh/h	678	1313	128	540	1249	1125	107	31	66	149	29	143
Arrive On Green	0.10	1.00	1.00	0.89	0.89	0.00	0.09	0.09	0.09	0.09	0.09	0.00
Sat Flow, veh/h	1774	1674	163	690	1864	1680	606	352	763	909	333	1640
Grp Volume(v), veh/h	160	0	800	38	573	0	115	0	0	41	0	0
Grp Sat Flow(s),veh/h/ln	1774	0	1837	690	1864	1680	1720	0	0	1243	0	1640
Q Serve(g_s), s	2.5	0.0	0.0	0.6	5.3	0.0	3.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	2.5	0.0	0.0	0.6	5.3	0.0	5.9	0.0	0.0	2.9	0.0	0.0
Prop In Lane	1.00		0.09	1.00		1.00	0.41		0.44	0.80		1.00
Lane Grp Cap(c), veh/h	678	0	1441	540	1249	1125	204	0	0	178	0	143
V/C Ratio(X)	0.24	0.00	0.56	0.07	0.46	0.00	0.56	0.00	0.00	0.23	0.00	0.00
Avail Cap(c_a), veh/h	761	0	1441	540	1249	1125	324	0	0	284	0	264
HCM Platoon Ratio	2.00	2.00	2.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.00	0.90	0.88	0.88	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	3.6	0.0	0.0	1.7	2.0	0.0	41.4	0.0	0.0	40.0	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	1.4	0.2	1.1	0.0	2.4	0.0	0.0	0.7	0.0	0.0
Initial Q Delay(d3),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
%ile Back of Q (50%), veh/ln	0.7	0.0	0.6	0.1	1.6	0.0	2.8	0.0	0.0	0.9	0.0	0.0
Lane Grp Delay (d), s/veh	3.8	0.0	1.4	1.9	3.0	0.0	43.8	0.0	0.0	40.7	0.0	0.0
Lane Grp LOS	A		A	A	A		D			D		
Approach Vol, veh/h		960			611			115			41	
Approach Delay, s/veh		1.8			3.0			43.8			40.7	
Approach LOS		A			A			D			D	
Timer												
Assigned Phs	5	2			6			8			4	
Phs Duration (G+Y+Rc), s	10.6	79.0			68.4			14.1			14.1	
Change Period (Y+Rc), s	6.0	6.0			6.0			6.0			6.0	
Max Green Setting (Gmax), s	9.0	73.0			58.0			15.0			15.0	
Max Q Clear Time (g_c+l1), s	4.5	2.0			7.3			7.9			4.9	
Green Ext Time (p_c), s	0.2	0.3			0.3			0.3			0.4	
Intersection Summary												
HCM 2010 Ctrl Delay			5.9									
HCM 2010 LOS			A									
Notes												







Lanes, Volumes, Timings
3: SR 611 & Stroud Mall East Dr

Stroud Twp. System 2 A.M. Peak Hour
Existing Year 2013

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	58	544	597	51	17	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	11	14	15
Grade (%)		0%	0%		0%	
Storage Length (ft)	115			250	0	150
Storage Lanes	1			1	1	1
Taper Length (ft)	60				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1711	1827	1766	1531	1816	1518
Flt Permitted	0.330				0.950	
Satd. Flow (perm)	594	1827	1766	1531	1816	1518
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				72		22
Link Speed (mph)		35	35		25	
Link Distance (ft)		306	1705		500	
Travel Time (s)		6.0	33.2		13.6	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.86	0.85	0.91	0.71	0.57	0.60
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	4%	4%	2%	6%	17%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	67	640	656	72	30	22
Shared Lane Traffic (%)						
Lane Group Flow (vph)	67	640	656	72	30	22
Turn Type	pm+pt	NA	NA	Perm	NA	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	13.0
Total Split (s)	15.0	85.0	70.0	70.0	15.0	15.0
Total Split (%)	15.0%	85.0%	70.0%	70.0%	15.0%	15.0%
Maximum Green (s)	9.0	79.0	64.0	64.0	9.0	9.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	0.2	0.2	0.2	3.0	3.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	0.2	0.2

Lanes, Volumes, Timings
3: SR 611 & Stroud Mall East Dr

Stroud Twp. System 2 A.M. Peak Hour
Existing Year 2013

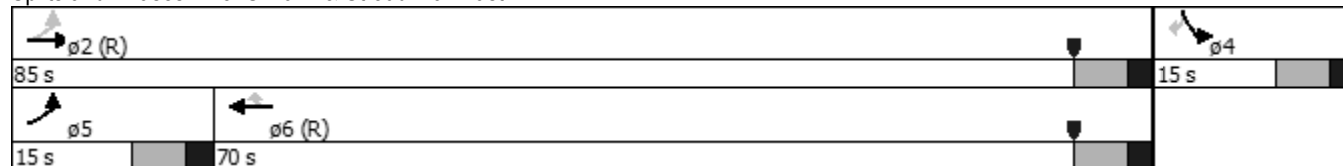
						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
Act Effect Green (s)	85.6	88.0	76.9	76.9	7.1	7.1
Actuated g/C Ratio	0.86	0.88	0.77	0.77	0.07	0.07
v/c Ratio	0.12	0.40	0.48	0.06	0.23	0.17
Control Delay	1.6	1.9	2.3	0.1	47.6	20.4
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0
Total Delay	1.6	2.1	2.3	0.1	47.6	20.4
LOS	A	A	A	A	D	C
Approach Delay		2.0	2.1		36.1	
Approach LOS		A	A		D	
Queue Length 50th (ft)	3	66	26	0	18	0
Queue Length 95th (ft)	m8	74	m27	m1	29	11
Internal Link Dist (ft)		226	1625		420	
Turn Bay Length (ft)	115			250		150
Base Capacity (vph)	608	1607	1357	1193	163	156
Starvation Cap Reductn	0	304	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.49	0.48	0.06	0.18	0.14

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 99 (99%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.48
 Intersection Signal Delay: 3.3
 Intersection Capacity Utilization 53.1%
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Intersection LOS: A
 ICU Level of Service A













Splits and Phases: 3: SR 611 & Stroud Mall East Dr



HCM 2010 Signalized Intersection Summary

3: SR 611 & Stroud Mall East Dr

Stroud Twp. System 2 A.M. Peak Hour
Existing Year 2013






















						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	58	544	597	51	17	13
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	186.3	182.7	182.7	186.3	186.4	168.9
Lanes	1	1	1	1	1	1
Cap, veh/h	511	1549	1367	1185	41	33
Arrive On Green	0.07	1.00	0.50	0.50	0.02	0.00
Sat Flow, veh/h	1774	1827	1827	1583	1775	1436
Grp Volume(v), veh/h	67	640	656	72	30	0
Grp Sat Flow(s),veh/h/ln	1774	1827	1827	1583	1775	1436
Q Serve(g_s), s	0.7	0.0	22.0	2.2	1.6	0.0
Cycle Q Clear(g_c), s	0.7	0.0	22.0	2.2	1.6	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	511	1549	1367	1185	41	33
V/C Ratio(X)	0.13	0.41	0.48	0.06	0.73	0.00
Avail Cap(c_a), veh/h	620	1549	1367	1185	172	139
HCM Platoon Ratio	2.00	2.00	0.67	0.67	1.00	1.00
Upstream Filter(I)	0.81	0.81	0.58	0.58	1.00	0.00
Uniform Delay (d), s/veh	5.0	0.0	11.3	6.4	45.2	0.0
Incr Delay (d2), s/veh	0.1	0.7	0.7	0.1	21.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.3	0.3	10.0	0.6	1.0	0.0
Lane Grp Delay (d), s/veh	5.1	0.7	12.0	6.4	66.8	0.0
Lane Grp LOS	A	A	B	A	E	
Approach Vol, veh/h		707	728		30	
Approach Delay, s/veh		1.1	11.5		66.8	
Approach LOS		A	B		E	
Timer						
Assigned Phs	5	2	6			
Phs Duration (G+Y+Rc), s	9.3	85.0	75.7			
Change Period (Y+Rc), s	6.0	6.0	6.0			
Max Green Setting (Gmax), s	9.0	79.0	64.0			
Max Q Clear Time (g_c+I1), s	2.7	2.0	24.0			
Green Ext Time (p_c), s	0.1	0.3	0.3			
Intersection Summary						
HCM 2010 Ctrl Delay			7.6			
HCM 2010 LOS			A			
Notes						

Lanes, Volumes, Timings

Stroud Twp. System 2 A.M. Peak Hour

4: Commercial Driveway/Chipperfield Dr & SR 611













Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	93	453	2	7	508	91	14	4	7	206	4	138
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	12	12	10	10	15	12	12	14	12	12	14
Grade (%)		-1%			1%			0%			1%	
Storage Length (ft)	100		0	230		215	0		90	0		200
Storage Lanes	1		0	1		1	0		1	0		1
Taper Length (ft)	60			40			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.998				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.967			0.953	
Satd. Flow (prot)	1553	1783	0	1676	1697	1637	0	1837	1511	*1687	1558	1680
Flt Permitted	0.153			0.467				0.755			0.712	
Satd. Flow (perm)	250	1783	0	824	1697	1637	0	1434	1511	*1687	1164	1680
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				108			98			157
Link Speed (mph)		35			35			25			35	
Link Distance (ft)		1705			1000			500			500	
Travel Time (s)		33.2			19.5			13.6			9.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.67	0.87	0.25	0.58	0.81	0.80	0.81	0.50	0.58	0.57	0.50	0.88
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	9%	7%	0%	0%	4%	8%	0%	0%	14%	16%	0%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	139	521	8	12	627	114	17	8	12	361	8	157
Shared Lane Traffic (%)												
Lane Group Flow (vph)	139	529	0	12	627	114	0	25	12	0	369	157
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8		8	4		4
Detector Phase	5	2		6	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	13.0	13.0		13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Total Split (s)	13.0	61.0		48.0	48.0	48.0	39.0	39.0	39.0	39.0	39.0	39.0
Total Split (%)	13.0%	61.0%		48.0%	48.0%	48.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%
Maximum Green (s)	7.0	55.0		42.0	42.0	42.0	33.0	33.0	33.0	33.0	33.0	33.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0		6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		6.0	6.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	0.2	3.0		3.0	3.0	3.0	0.2	0.2	0.2	0.2	0.2	0.2

Lanes, Volumes, Timings
4: Commercial Driveway/Chipperfield Dr & SR 611

Stroud Twp. System 2 A.M. Peak Hour

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	22.0		22.0	22.0	22.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	10.0		10.0	10.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Min		C-Min	C-Min	C-Min	None	None	None	None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	55.2	55.2		42.2	42.2	42.2		32.8	32.8		32.8	32.8
Actuated g/C Ratio	0.55	0.55		0.42	0.42	0.42		0.33	0.33		0.33	0.33
v/c Ratio	0.61	0.54		0.03	0.88	0.15		0.05	0.02		0.97	0.24
Control Delay	21.9	15.4		17.6	42.0	4.6		23.3	0.0		73.5	4.9
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	21.9	15.4		17.6	42.0	4.6		23.3	0.0		73.5	4.9
LOS	C	B		B	D	A		C	A		E	A
Approach Delay		16.8			35.9			15.8			53.1	
Approach LOS		B			D			B			D	
Queue Length 50th (ft)	40	248		4	359	2		11	0		229	0
Queue Length 95th (ft)	54	267		10	439	25		16	0		156	40
Internal Link Dist (ft)		1625			920			420			420	
Turn Bay Length (ft)	100			230		215			90			200
Base Capacity (vph)	229	986		349	717	755		474	565		385	660
Starvation Cap Reductn	0	0		0	0	0		0	0		0	0
Spillback Cap Reductn	0	0		0	0	0		0	0		0	0
Storage Cap Reductn	0	0		0	0	0		0	0		0	0
Reduced v/c Ratio	0.61	0.54		0.03	0.87	0.15		0.05	0.02		0.96	0.24

Intersection Summary

Area Type: Other

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 41 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.97

Intersection Signal Delay: 33.6

Intersection LOS: C






Intersection Capacity Utilization 65.2%

ICU Level of Service C

Analysis Period (min) 15






















* User Entered Value

Splits and Phases: 4: Commercial Driveway/Chipperfield Dr & SR 611

 ø2 (R)		 ø4
61 s		39 s
 ø5	 ø6 (R)	 ø8
13 s	48 s	39 s

HCM 2010 Signalized Intersection Summary
4: Commercial Driveway/Chipperfield Dr & SR 611













Stroud Twp. System 2 A.M. Peak Hour
Existing Year 2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	93	453	2	7	508	91	14	4	7	206	4	138
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	175.2	178.6	191.0	189.0	181.8	182.0	190.0	190.0	173.3	189.0	163.5	192.8
Lanes	1	1	0	1	1	1	0	1	1	0	1	1
Cap, veh/h	250	943	14	425	746	635	62	18	500	73	0	556
Arrive On Green	0.09	0.71	0.71	0.41	0.41	0.41	0.34	0.34	0.34	0.34	0.34	0.34
Sat Flow, veh/h	1668	1755	27	884	1818	1547	0	54	1473	0	0	1638
Grp Volume(v), veh/h	139	0	529	12	627	114	25	0	12	369	0	157
Grp Sat Flow(s),veh/h/ln	1668	0	1782	884	1818	1547	54	0	1473	0	0	1638
Q Serve(g_s), s	4.5	0.0	13.6	0.8	30.2	4.6	0.0	0.0	0.5	0.0	0.0	6.8
Cycle Q Clear(g_c), s	4.5	0.0	13.6	2.1	30.2	4.6	33.0	0.0	0.5	33.0	0.0	6.8
Prop In Lane	1.00		0.02	1.00		1.00	0.68		1.00	0.98		1.00
Lane Grp Cap(c), veh/h	250	0	957	425	746	635	81	0	500	73	0	556
V/C Ratio(X)	0.56	0.00	0.55	0.03	0.84	0.18	0.31	0.00	0.02	5.04	0.00	0.28
Avail Cap(c_a), veh/h	261	0	1007	444	785	668	81	0	500	73	0	556
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.00	0.93	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.7	0.0	8.4	17.9	25.8	18.3	26.8	0.0	21.4	48.6	0.0	23.5
Incr Delay (d2), s/veh	2.2	0.0	2.1	0.1	11.0	0.6	2.2	0.0	0.0	1848.1	0.0	0.3
Initial Q Delay(d3),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
%ile Back of Q (50%), veh/ln	1.7	0.0	4.6	0.2	15.2	1.8	0.5	0.0	0.2	39.4	0.0	2.8
Lane Grp Delay (d), s/veh	21.9	0.0	10.5	18.0	36.8	18.9	29.0	0.0	21.4	1896.7	0.0	23.8
Lane Grp LOS	C		B	B	D	B	C		C	F		C
Approach Vol, veh/h		668			753			37			526	
Approach Delay, s/veh		12.9			33.8			26.5			1337.7	
Approach LOS		B			C			C			F	
Timer												
Assigned Phs	5	2			6			8			4	
Phs Duration (G+Y+Rc), s	12.4	58.3			45.9			39.0			39.0	
Change Period (Y+Rc), s	6.0	6.0			6.0			6.0			6.0	
Max Green Setting (Gmax), s	7.0	55.0			42.0			33.0			33.0	
Max Q Clear Time (g_c+I1), s	6.5	15.6			32.2			35.0			35.0	
Green Ext Time (p_c), s	0.0	21.9			7.7			0.0			0.0	
Intersection Summary												
HCM 2010 Ctrl Delay			372.3									
HCM 2010 LOS			F									
Notes												

Lanes, Volumes, Timings
1: Bridge St & SR 611

Stroud Twp. System 2 P.M. Peak Hour

Existing Year 2013

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	521	112	251	640	193	308
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	14	11	12
Grade (%)	-3%			3%	8%	
Storage Length (ft)		185	270		0	145
Storage Lanes		1	1		1	1
Taper Length (ft)			85		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1828	1538	1702	1957	1658	1505
Flt Permitted			0.289		0.950	
Satd. Flow (perm)	1828	1538	518	1957	1658	1505
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		118				328
Link Speed (mph)	35			35	35	
Link Distance (ft)	1000			629	500	
Travel Time (s)	19.5			12.3	9.7	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.94	0.95	0.93	0.93	0.95	0.94
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	3%	1%	2%	1%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	554	118	270	688	203	328
Shared Lane Traffic (%)						
Lane Group Flow (vph)	554	118	270	688	203	328
Turn Type	NA	pm+ov	pm+pt	NA	NA	Perm
Protected Phases	2	8	1	6	8	
Permitted Phases		2	6			8
Detector Phase	2	8	1	6	8	8
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	13.0
Total Split (s)	48.0	26.0	21.0	69.0	26.0	26.0
Total Split (%)	50.5%	27.4%	22.1%	72.6%	27.4%	27.4%
Maximum Green (s)	42.0	20.0	15.0	63.0	20.0	20.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?						
Vehicle Extension (s)	6.0	3.0	3.0	6.0	3.0	3.0
Minimum Gap (s)	3.0	0.2	0.2	3.0	0.2	0.2

Lanes, Volumes, Timings
1: Bridge St & SR 611

Stroud Twp. System 2 P.M. Peak Hour

Existing Year 2013

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Time Before Reduce (s)	22.0	0.0	0.0	22.0	0.0	0.0
Time To Reduce (s)	11.0	0.0	0.0	11.0	0.0	0.0
Recall Mode	C-Min	None	None	C-Min	None	None
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
Act Effect Green (s)	49.4	71.8	66.5	66.5	16.5	16.5
Actuated g/C Ratio	0.52	0.76	0.70	0.70	0.17	0.17
v/c Ratio	0.58	0.10	0.54	0.50	0.71	0.62
Control Delay	20.5	1.0	9.6	4.4	50.2	9.3
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	20.5	1.0	9.6	4.5	50.2	9.3
LOS	C	A	A	A	D	A
Approach Delay	17.1			6.0	24.9	
Approach LOS	B			A	C	
Queue Length 50th (ft)	224	0	28	74	115	0
Queue Length 95th (ft)	382	13	55	86	184	71
Internal Link Dist (ft)	920			549	420	
Turn Bay Length (ft)		185	270			145
Base Capacity (vph)	949	1244	549	1370	349	575
Starvation Cap Reductn	0	0	0	97	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.09	0.49	0.54	0.58	0.57

Intersection Summary

Area Type: Other

Cycle Length: 95

Actuated Cycle Length: 95

Offset: 12 (13%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 14.1

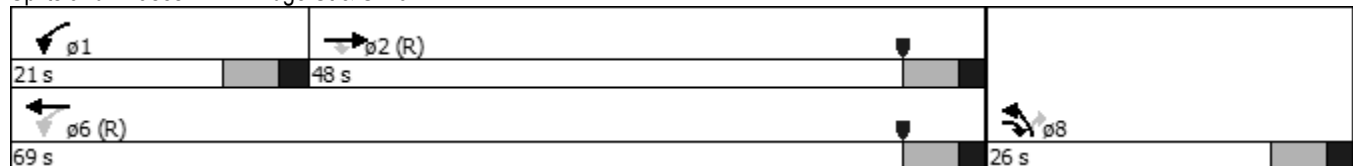
Intersection LOS: B

Intersection Capacity Utilization 67.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Bridge St & SR 611























HCM 2010 analysis expects strict NEMA phasing.













Lanes, Volumes, Timings

Stroud Twp. System 2 P.M. Peak Hour

2: Commercial Driveway/Stroud Mall Main Dr & SR 611

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	172	731	13	13	701	66	23	4	11	99	3	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	15	16	16	16	16	14	14	15
Grade (%)		0%			0%			-1%			-5%	
Storage Length (ft)	230		0	75		150	0		0	0		125
Storage Lanes	1		0	1		1	0		0	0		1
Taper Length (ft)	80			60			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00				1.00				0.98
Frt		0.997				0.850		0.972				0.850
Flt Protected	0.950			0.950				0.974			0.954	
Satd. Flow (prot)	1787	1875	0	1805	2049	1830	0	2049	0	0	1982	1803
Flt Permitted	0.232			0.357				0.772			0.787	
Satd. Flow (perm)	436	1875	0	678	2049	1830	0	1621	0	0	1635	1760
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				103		12				181
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		629			306			500			500	
Travel Time (s)		12.3			6.0			13.6			13.6	
Confl. Peds. (#/hr)			3	3			1					1
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.84	0.91	0.75	0.60	0.96	0.86	0.69	0.25	0.83	0.89	0.75	0.86
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	0%	0%	2%	0%	0%	0%	0%	0%	0%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	205	803	17	22	730	77	33	16	13	111	4	181
Shared Lane Traffic (%)												
Lane Group Flow (vph)	205	820	0	22	730	77	0	62	0	0	115	181
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		4
Detector Phase	5	2		6	6	6	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	13.0	13.0		13.0	13.0	13.0	13.0	13.0		13.0	13.0	13.0
Total Split (s)	16.0	76.0		60.0	60.0	60.0	19.0	19.0		19.0	19.0	19.0
Total Split (%)	16.8%	80.0%		63.2%	63.2%	63.2%	20.0%	20.0%		20.0%	20.0%	20.0%
Maximum Green (s)	10.0	70.0		54.0	54.0	54.0	13.0	13.0		13.0	13.0	13.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0			0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0		6.0			6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	0.2		0.2	0.2	0.2	3.0	3.0		3.0	3.0	3.0
Minimum Gap (s)	0.2	0.2		0.2	0.2	0.2	0.2	0.2		0.2	0.2	0.2

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	71.9	71.9		57.5	57.5	57.5		11.1			11.1	11.1
Actuated g/C Ratio	0.76	0.76		0.61	0.61	0.61		0.12			0.12	0.12
v/c Ratio	0.46	0.58		0.05	0.59	0.07		0.31			0.61	0.50
Control Delay	8.5	7.2		2.7	6.6	0.2		35.9			53.2	10.9
Queue Delay	0.0	0.1		0.0	0.7	0.0		0.0			0.0	0.0
Total Delay	8.5	7.3		2.7	7.4	0.2		35.9			53.2	10.9
LOS	A	A		A	A	A		D			D	B
Approach Delay		7.5			6.6			35.9			27.3	
Approach LOS		A			A			D			C	
Queue Length 50th (ft)	22	102		2	94	0		28			66	0
Queue Length 95th (ft)	84	374		m2	116	m1		13			99	51
Internal Link Dist (ft)		549			226			420			420	
Turn Bay Length (ft)	230			75		150						125
Base Capacity (vph)	472	1420		410	1239	1147		232			223	397
Starvation Cap Reductn	0	77		0	225	0		0			0	0
Spillback Cap Reductn	0	0		0	0	0		0			0	0
Storage Cap Reductn	0	0		0	0	0		0			0	0
Reduced v/c Ratio	0.43	0.61		0.05	0.72	0.07		0.27			0.52	0.46

Intersection Summary

Area Type: _____ Other _____

Cycle Length: 95

Actuated Cycle Length: 95

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.61

Intersection Signal Delay: 10.6

Intersection LOS: B

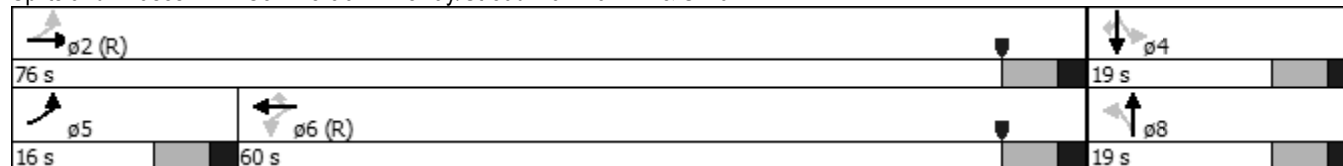
Intersection Capacity Utilization 70.2%





















ICU Level of Service C

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.













Splits and Phases: 2: Commercial Driveway/Stroud Mall Main Dr & SR 611



												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	172	731	13	13	701	66	23	4	11	99	3	156
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	188.1	188.2	190.0	190.0	193.7	197.6	198.6	198.6	198.6	202.5	202.5	200.5
Lanes	1	1	0	1	1	1	0	1	0	0	1	1
Cap, veh/h	582	1418	30	515	1247	1081	136	65	37	221	5	162
Arrive On Green	0.13	1.00	1.00	0.86	0.86	0.00	0.09	0.09	0.09	0.09	0.09	0.00
Sat Flow, veh/h	1792	1835	39	677	1937	1680	791	681	390	1503	54	1705
Grp Volume(v), veh/h	205	0	820	22	730	0	62	0	0	115	0	0
Grp Sat Flow(s),veh/h/ln	1792	0	1874	677	1937	1680	1862	0	0	1557	0	1705
Q Serve(g_s), s	3.4	0.0	0.0	0.4	9.8	0.0	0.0	0.0	0.0	3.7	0.0	0.0
Cycle Q Clear(g_c), s	3.4	0.0	0.0	0.4	9.8	0.0	2.7	0.0	0.0	6.5	0.0	0.0
Prop In Lane	1.00		0.02	1.00		1.00	0.53		0.21	0.97		1.00
Lane Grp Cap(c), veh/h	582	0	1448	515	1247	1081	238	0	0	226	0	162
V/C Ratio(X)	0.35	0.00	0.57	0.04	0.59	0.00	0.26	0.00	0.00	0.51	0.00	0.00
Avail Cap(c_a), veh/h	668	0	1448	515	1247	1081	317	0	0	299	0	245
HCM Platoon Ratio	2.00	2.00	2.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.77	0.00	0.77	0.80	0.80	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	4.5	0.0	0.0	2.3	3.0	0.0	38.3	0.0	0.0	39.9	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	1.2	0.1	1.6	0.0	0.6	0.0	0.0	1.8	0.0	0.0
Initial Q Delay(d3),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
%ile Back of Q (50%), veh/ln	0.9	0.0	0.5	0.1	2.9	0.0	1.4	0.0	0.0	2.7	0.0	0.0
Lane Grp Delay (d), s/veh	4.8	0.0	1.2	2.5	4.6	0.0	38.9	0.0	0.0	41.7	0.0	0.0
Lane Grp LOS	A		A	A	A		D			D		
Approach Vol, veh/h		1025			752			62			115	
Approach Delay, s/veh		2.0			4.6			38.9			41.7	
Approach LOS		A			A			D			D	
Timer												
Assigned Phs	5	2			6			8			4	
Phs Duration (G+Y+Rc), s	11.7	76.0			64.3			14.6			14.6	
Change Period (Y+Rc), s	6.0	6.0			6.0			6.0			6.0	
Max Green Setting (Gmax), s	10.0	70.0			54.0			13.0			13.0	
Max Q Clear Time (g_c+l1), s	5.4	2.0			11.8			4.7			8.5	
Green Ext Time (p_c), s	0.3	0.3			0.3			0.4			0.2	
Intersection Summary												
HCM 2010 Ctrl Delay			6.5									
HCM 2010 LOS			A									
Notes												

Lanes, Volumes, Timings
3: SR 611 & Stroud Mall East Dr







Stroud Twp. System 2 P.M. Peak Hour
Existing Year 2013

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	19	583	714	77	36	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	12	11	11	14	15
Grade (%)		0%	0%		0%	
Storage Length (ft)	115			250	0	150
Storage Lanes	1			1	1	1
Taper Length (ft)	60				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1745	1863	1801	1561	1925	1742
Flt Permitted	0.249				0.950	
Satd. Flow (perm)	457	1863	1801	1561	1925	1742
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				105		77
Link Speed (mph)		35	35		25	
Link Distance (ft)		306	1705		500	
Travel Time (s)		6.0	33.2		13.6	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.75	0.90	0.87	0.73	0.57	0.82
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	2%	0%	0%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	25	648	821	105	63	77
Shared Lane Traffic (%)						
Lane Group Flow (vph)	25	648	821	105	63	77
Turn Type	pm+pt	NA	NA	Perm	NA	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Detector Phase	5	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	13.0	13.0	13.0	13.0	13.0	13.0
Total Split (s)	13.0	81.0	68.0	68.0	14.0	14.0
Total Split (%)	13.7%	85.3%	71.6%	71.6%	14.7%	14.7%
Maximum Green (s)	7.0	75.0	62.0	62.0	8.0	8.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	0.2	0.2	0.2	3.0	3.0
Minimum Gap (s)	0.2	0.2	0.2	0.2	0.2	0.2

Lanes, Volumes, Timings
3: SR 611 & Stroud Mall East Dr

Stroud Twp. System 2 P.M. Peak Hour

Existing Year 2013
















						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Walk Time (s)						
Flash Dont Walk (s)						
Pedestrian Calls (#/hr)						
Act Effect Green (s)	78.0	79.2	74.3	74.3	7.3	7.3
Actuated g/C Ratio	0.82	0.83	0.78	0.78	0.08	0.08
v/c Ratio	0.06	0.42	0.58	0.08	0.43	0.38
Control Delay	2.4	3.3	3.6	0.1	50.6	15.6
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	2.4	3.6	3.6	0.1	50.6	15.6
LOS	A	A	A	A	D	B
Approach Delay		3.5	3.2		31.3	
Approach LOS		A	A		C	
Queue Length 50th (ft)	1	85	44	0	37	0
Queue Length 95th (ft)	m4	130	87	m0	48	34
Internal Link Dist (ft)		226	1625		420	
Turn Bay Length (ft)	115			250		150
Base Capacity (vph)	469	1552	1409	1244	162	217
Starvation Cap Reductn	0	344	0	0	0	0
Spillback Cap Reductn	0	0	23	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.54	0.59	0.08	0.39	0.35

Intersection Summary

Area Type: Other
 Cycle Length: 95
 Actuated Cycle Length: 95
 Offset: 93 (98%), Referenced to phase 2:EBTL and 6:WBT, Start of Yellow
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.58
 Intersection Signal Delay: 5.6
 Intersection Capacity Utilization 51.5%
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Intersection LOS: A
 ICU Level of Service A













Splits and Phases: 3: SR 611 & Stroud Mall East Dr

								
ø2 (R)						ø4		
81 s						14 s		
								
ø5		ø6 (R)						
13 s		68 s						

HCM 2010 Signalized Intersection Summary

3: SR 611 & Stroud Mall East Dr

Stroud Twp. System 2 P.M. Peak Hour
Existing Year 2013






















						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	19	583	714	77	36	63
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	190.0	186.3	186.3	190.0	197.6	193.7
Lanes	1	1	1	1	1	1
Cap, veh/h	442	1535	1374	1191	83	73
Arrive On Green	0.04	1.00	0.74	0.74	0.04	0.00
Sat Flow, veh/h	1810	1863	1863	1615	1882	1647
Grp Volume(v), veh/h	25	648	821	105	63	0
Grp Sat Flow(s),veh/h/ln	1810	1863	1863	1615	1882	1647
Q Serve(g_s), s	0.3	0.0	18.8	1.7	3.0	0.0
Cycle Q Clear(g_c), s	0.3	0.0	18.8	1.7	3.0	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	442	1535	1374	1191	83	73
V/C Ratio(X)	0.06	0.42	0.60	0.09	0.76	0.00
Avail Cap(c_a), veh/h	544	1535	1374	1191	165	145
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.77	0.77	1.00	0.00
Uniform Delay (d), s/veh	4.6	0.0	5.6	3.4	43.0	0.0
Incr Delay (d2), s/veh	0.0	0.7	1.5	0.1	13.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.1	0.3	6.5	0.5	1.7	0.0
Lane Grp Delay (d), s/veh	4.7	0.7	7.1	3.5	56.1	0.0
Lane Grp LOS	A	A	A	A	E	
Approach Vol, veh/h		673	926		63	
Approach Delay, s/veh		0.8	6.7		56.1	
Approach LOS		A	A		E	
Timer						
Assigned Phs	5	2	6			
Phs Duration (G+Y+Rc), s	7.9	81.0	73.1			
Change Period (Y+Rc), s	6.0	6.0	6.0			
Max Green Setting (Gmax), s	7.0	75.0	62.0			
Max Q Clear Time (g_c+I1), s	2.3	2.0	20.8			
Green Ext Time (p_c), s	0.0	0.3	0.3			
Intersection Summary						
HCM 2010 Ctrl Delay			6.2			
HCM 2010 LOS			A			
Notes						

Lanes, Volumes, Timings

Stroud Twp. System 2 P.M. Peak Hour

4: Commercial Driveway/Chipperfield Dr & SR 611













Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	216	499	1	5	489	54	28	7	7	251	11	248
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	12	12	10	10	15	12	12	14	12	12	14
Grade (%)		-1%			1%			0%			1%	
Storage Length (ft)	100		0	230		215	0		90	0		200
Storage Lanes	1		0	1		1	0		1	0		1
Taper Length (ft)	60			40			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00					0.98			0.98		1.00	
Frt		0.999				0.850			0.850			0.850
Flt Protected	0.950			0.950				0.960			0.955	
Satd. Flow (prot)	1660	1889	0	1676	1747	1733	0	1824	1723	*1687	1772	1697
Flt Permitted	0.245			0.467				0.575			0.706	
Satd. Flow (perm)	428	1889	0	824	1747	1694	0	1092	1683	*1687	1307	1697
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				103			103			264
Link Speed (mph)		35			35			25			35	
Link Distance (ft)		1705			1000			500			500	
Travel Time (s)		33.2			19.5			13.6			9.7	
Confl. Peds. (#/hr)	2					2			2	2		
Confl. Bikes (#/hr)												
Peak Hour Factor	0.88	0.95	0.25	0.42	0.95	0.91	0.72	0.88	0.58	0.84	0.50	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	1%	0%	0%	1%	2%	0%	0%	0%	2%	0%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	245	525	4	12	515	59	39	8	12	299	22	264
Shared Lane Traffic (%)												
Lane Group Flow (vph)	245	529	0	12	515	59	0	47	12	0	321	264
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8		8	4		4
Detector Phase	5	2		6	6	6	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	13.0	13.0		13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Total Split (s)	16.0	59.0		43.0	43.0	43.0	36.0	36.0	36.0	36.0	36.0	36.0
Total Split (%)	16.8%	62.1%		45.3%	45.3%	45.3%	37.9%	37.9%	37.9%	37.9%	37.9%	37.9%
Maximum Green (s)	10.0	53.0		37.0	37.0	37.0	30.0	30.0	30.0	30.0	30.0	30.0
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0		6.0	6.0		6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	6.0		6.0	6.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	0.2	3.0		3.0	3.0	3.0	0.2	0.2	0.2	0.2	0.2	0.2

Lanes, Volumes, Timings
4: Commercial Driveway/Chipperfield Dr & SR 611

Stroud Twp. System 2 P.M. Peak Hour

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	22.0		22.0	22.0	22.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	10.0		10.0	10.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Min		C-Min	C-Min	C-Min	None	None	None	None	None	None
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	56.1	56.1		39.9	39.9	39.9		26.9	26.9		26.9	26.9
Actuated g/C Ratio	0.59	0.59		0.42	0.42	0.42		0.28	0.28		0.28	0.28
v/c Ratio	0.63	0.47		0.03	0.70	0.08		0.15	0.02		0.87	0.39
Control Delay	20.1	14.5		18.6	30.3	1.2		25.3	0.1		56.1	5.0
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	20.1	14.5		18.6	30.3	1.2		25.3	0.1		56.1	5.0
LOS	C	B		B	C	A		C	A		E	A
Approach Delay		16.2			27.1			20.2			33.1	
Approach LOS		B			C			C			C	
Queue Length 50th (ft)	68	152		5	274	0		20	0		175	0
Queue Length 95th (ft)	155	332		7	394	7		46	0		127	54
Internal Link Dist (ft)		1625			920			420			420	
Turn Bay Length (ft)	100			230		215			90			200
Base Capacity (vph)	390	1116		349	741	777		344	601		412	716
Starvation Cap Reductn	0	0		0	0	0		0	0		0	0
Spillback Cap Reductn	0	0		0	0	0		0	0		0	0
Storage Cap Reductn	0	0		0	0	0		0	0		0	0
Reduced v/c Ratio	0.63	0.47		0.03	0.70	0.08		0.14	0.02		0.78	0.37

Intersection Summary

Area Type: Other

Cycle Length: 95

Actuated Cycle Length: 95

Offset: 43 (45%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 24.5

Intersection LOS: C

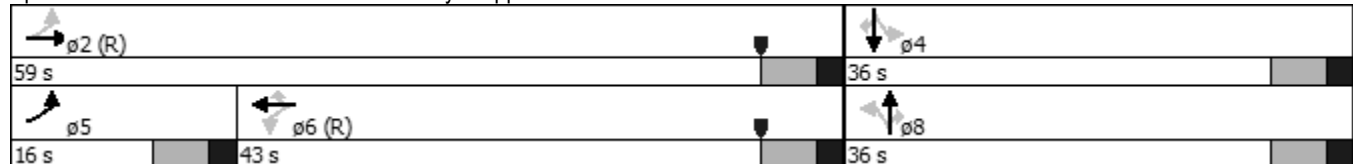
Intersection Capacity Utilization 73.9%

ICU Level of Service D

Analysis Period (min) 15






















* User Entered Value

Splits and Phases: 4: Commercial Driveway/Chipperfield Dr & SR 611



HCM 2010 Signalized Intersection Summary
4: Commercial Driveway/Chipperfield Dr & SR 611

Stroud Twp. System 2 P.M. Peak Hour
Existing Year 2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	216	499	1	5	489	54	28	7	7	251	11	248
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow veh/h/ln	187.2	189.1	191.0	189.0	187.2	192.8	190.0	190.0	197.6	189.0	185.6	194.7
Lanes	1	1	0	1	1	1	0	1	1	0	1	1
Cap, veh/h	368	1001	8	391	680	594	73	9	557	77	0	549
Arrive On Green	0.10	0.53	0.53	0.36	0.36	0.36	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	1783	1874	14	883	1872	1634	0	26	1675	0	0	1650
Grp Volume(v), veh/h	245	0	529	12	515	59	47	0	12	321	0	264
Grp Sat Flow(s),veh/h/ln	1783	0	1888	883	1872	1634	26	0	1675	0	0	1650
Q Serve(g_s), s	7.3	0.0	16.3	0.8	21.8	2.1	0.0	0.0	0.4	0.0	0.0	11.5
Cycle Q Clear(g_c), s	7.3	0.0	16.3	1.8	21.8	2.1	30.0	0.0	0.4	30.0	0.0	11.5
Prop In Lane	1.00		0.01	1.00		1.00	0.83		1.00	0.93		1.00
Lane Grp Cap(c), veh/h	368	0	1008	391	680	594	82	0	557	77	0	549
V/C Ratio(X)	0.67	0.00	0.52	0.03	0.76	0.10	0.58	0.00	0.02	4.16	0.00	0.48
Avail Cap(c_a), veh/h	380	0	1110	433	768	671	82	0	557	77	0	549
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.00	0.91	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.0	0.0	13.6	19.1	25.2	18.9	39.6	0.0	20.2	45.1	0.0	23.9
Incr Delay (d2), s/veh	3.9	0.0	1.8	0.1	7.7	0.3	9.5	0.0	0.0	1452.8	0.0	0.7
Initial Q Delay(d3),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
%ile Back of Q (50%), veh/ln	3.3	0.0	7.1	0.2	11.0	0.9	1.3	0.0	0.2	32.9	0.0	4.7
Lane Grp Delay (d), s/veh	21.9	0.0	15.4	19.3	32.9	19.3	49.1	0.0	20.2	1497.9	0.0	24.5
Lane Grp LOS	C		B	B	C	B	D		C	F		C
Approach Vol, veh/h		774			586			59			585	
Approach Delay, s/veh		17.4			31.2			43.2			833.0	
Approach LOS		B			C			D			F	
Timer												
Assigned Phs	5	2			6			8			4	
Phs Duration (G+Y+Rc), s	15.4	54.1			38.8			36.0			36.0	
Change Period (Y+Rc), s	6.0	6.0			6.0			6.0			6.0	
Max Green Setting (Gmax), s	10.0	53.0			37.0			30.0			30.0	
Max Q Clear Time (g_c+I1), s	9.3	18.3			23.8			32.0			32.0	
Green Ext Time (p_c), s	0.1	17.2			9.0			0.0			0.0	

Intersection Summary






















HCM 2010 Ctrl Delay 260.3
HCM 2010 LOS F

Notes

Lanes, Volumes, Timings
8: Dreher Ave/School Drive & Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	113	432	24	96	345	207	24	56	157	103	28	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	14	12	11	12	14	12	14	16	14	14	12
Grade (%)		-1%			0%			1%			1%	
Storage Length (ft)	145		0	125		210	85		0	105		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.988				0.850		0.886			0.901	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1435	1716	0	1468	1598	1409	1469	1525	0	1567	1487	0
Flt Permitted	0.524			0.105			0.699			0.328		
Satd. Flow (perm)	791	1716	0	162	1598	1409	1081	1525	0	541	1487	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				225		123			59	
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		538			949			624			208	
Travel Time (s)		10.5			18.5			12.2			5.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.90	0.58	0.79	0.93	0.92	0.66	0.92	0.81	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	4%	24%	7%	7%	10%	10%	10%	4%	10%	10%	10%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	123	480	41	122	371	225	36	61	194	112	30	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	123	521	0	122	371	225	36	255	0	112	89	0
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	2	2		1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	17.0	17.0		12.0	17.0	17.0	13.0	13.0		13.0	13.0	
Total Split (s)	43.0	43.0		12.0	55.0	55.0	31.0	31.0		31.0	31.0	
Total Split (%)	35.8%	35.8%		10.0%	45.8%	45.8%	25.8%	25.8%		25.8%	25.8%	
Maximum Green (s)	36.0	36.0		5.0	48.0	48.0	25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	0.0	-2.0	-2.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	7.0	4.0	4.0		6.0	6.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	

Lane Group ø9

Lane Configurations

Volume (vph)

Ideal Flow (vphpl)

Lane Width (ft)

Grade (%)

Storage Length (ft)

Storage Lanes

Taper Length (ft)

Lane Util. Factor

Ped Bike Factor

Frt

Flt Protected

Satd. Flow (prot)

Flt Permitted

Satd. Flow (perm)

Right Turn on Red

Satd. Flow (RTOR)

Link Speed (mph)

Link Distance (ft)

Travel Time (s)

Confl. Peds. (#/hr)

Confl. Bikes (#/hr)

Peak Hour Factor

Growth Factor

Heavy Vehicles (%)

Bus Blockages (#/hr)

Parking (#/hr)

Mid-Block Traffic (%)

Adj. Flow (vph)

Shared Lane Traffic (%)

Lane Group Flow (vph)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phase

Switch Phase

Minimum Initial (s) 1.0

Minimum Split (s) 34.0

Total Split (s) 34.0

Total Split (%) 28%

Maximum Green (s) 32.0

Yellow Time (s) 2.0

All-Red Time (s) 0.0

Lost Time Adjust (s)

Total Lost Time (s)

Lead/Lag

Lead-Lag Optimize?













Vehicle Extension (s) 3.0

Minimum Gap (s) 3.0

Lanes, Volumes, Timings
8: Dreher Ave/School Drive & Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	C-Max	C-Max		None	C-Max	C-Max	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	38.0	38.0		50.0	50.0	48.0	27.0	27.0		25.0	25.0	
Actuated g/C Ratio	0.32	0.32		0.42	0.42	0.40	0.22	0.22		0.21	0.21	
v/c Ratio	0.49	0.95		0.85	0.56	0.32	0.15	0.58		1.00	0.25	
Control Delay	41.3	69.2		71.5	31.8	7.4	39.3	26.9		133.9	18.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	41.3	69.2		71.5	31.8	7.4	39.3	26.9		133.9	18.2	
LOS	D	E		E	C	A	D	C		F	B	
Approach Delay		63.9			30.9			28.5			82.7	
Approach LOS		E			C			C			F	
Queue Length 50th (ft)	77	392		65	254	25	23	90		87	19	
Queue Length 95th (ft)	142	#615		#123	359	81	38	180		#209	65	
Internal Link Dist (ft)		458			869			544			128	
Turn Bay Length (ft)	145			125		210	85			105		
Base Capacity (vph)	250	546		143	665	698	243	438		112	356	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.49	0.95		0.85	0.56	0.32	0.15	0.58		1.00	0.25	

Intersection Summary

Area Type: CBD

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 114 (95%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.00

Intersection Signal Delay: 47.6

Intersection LOS: D

Intersection Capacity Utilization 69.8%









ICU Level of Service C

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 8: Dreher Ave/School Drive & Main Street

 ø1	 ø2 (R)		 ø4	 ø9
12 s	43 s		31 s	34 s
 ø6 (R)			 ø8	
55 s			31 s	



















Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	25.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings
9: 9th St & Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	375	14	1	229	133	29	56	49	256	6	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	11	11	12	11	11	11	10	10	10
Grade (%)		4%			1%			5%			-2%	
Storage Length (ft)	0		0	0		0	0		0	135		0
Storage Lanes	0		0	0		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.989				0.850		0.955			0.875	
Flt Protected		0.986			0.999			0.986		0.950		
Satd. Flow (prot)	0	2759	0	0	1551	1276	0	1508	0	1487	1410	0
Flt Permitted		0.706			0.993			0.899		0.585		
Satd. Flow (perm)	0	1976	0	0	1542	1276	0	1375	0	916	1410	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			35	
Link Distance (ft)		352			552			437			1438	
Travel Time (s)		7.9			5.2			11.9			4.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.94	0.32	0.25	0.87	0.79	0.56	0.82	0.82	0.96	0.50	0.68
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	3%	0%	0%	6%	2%	0%	0%	2%	3%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0			0						
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	169	399	44	4	263	168	52	68	60	267	12	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	612	0	0	267	168	0	180	0	267	72	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	9.5	14.5		14.5	14.5	14.5	13.0	13.0		13.0	13.0	
Total Split (s)	9.5	46.0		36.5	36.5	36.5	50.0	50.0		50.0	50.0	
Total Split (%)	7.9%	38.3%		30.4%	30.4%	30.4%	41.7%	41.7%		41.7%	41.7%	
Maximum Green (s)	5.0	41.5		32.0	32.0	32.0	44.0	44.0		44.0	44.0	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-0.5			-0.5	-0.5		-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	

Lane Group ø9

Lane Configurations

Volume (vph)

Ideal Flow (vphpl)

Lane Width (ft)

Grade (%)

Storage Length (ft)

Storage Lanes

Taper Length (ft)

Lane Util. Factor

Ped Bike Factor

Frt

Flt Protected

Satd. Flow (prot)

Flt Permitted

Satd. Flow (perm)

Right Turn on Red

Satd. Flow (RTOR)

Link Speed (mph)

Link Distance (ft)

Travel Time (s)

Confl. Peds. (#/hr)

Confl. Bikes (#/hr)

Peak Hour Factor

Growth Factor

Heavy Vehicles (%)

Bus Blockages (#/hr)

Parking (#/hr)

Mid-Block Traffic (%)

Adj. Flow (vph)

Shared Lane Traffic (%)

Lane Group Flow (vph)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phase

Switch Phase

Minimum Initial (s) 1.0

Minimum Split (s) 24.0

Total Split (s) 24.0

Total Split (%) 20%

Maximum Green (s) 22.0

Yellow Time (s) 2.0

All-Red Time (s) 0.0

Lost Time Adjust (s)

Total Lost Time (s)

Lead/Lag

Lead-Lag Optimize?













Vehicle Extension (s) 3.0

Minimum Gap (s) 3.0

Lanes, Volumes, Timings
9: 9th St & Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		48.4			48.4	48.4		39.6		39.6	39.6	
Actuated g/C Ratio		0.40			0.40	0.40		0.33		0.33	0.33	
v/c Ratio		0.77			0.43	0.33		0.40		0.88	0.15	
Control Delay		20.3			26.0	24.9		32.4		66.7	27.0	
Queue Delay		0.0			0.0	0.0		0.0		0.0	0.0	
Total Delay		20.3			26.0	24.9		32.4		66.7	27.0	
LOS		C			C	C		C		E	C	
Approach Delay		20.3			25.5			32.4			58.3	
Approach LOS		C			C			C			E	
Queue Length 50th (ft)		189			144	90		104		188	38	
Queue Length 95th (ft)		m248			186	115		142		#318	37	
Internal Link Dist (ft)		272			472			357			1358	
Turn Bay Length (ft)										135		
Base Capacity (vph)		796			621	514		527		351	540	
Starvation Cap Reductn		0			0	0		0		0	0	
Spillback Cap Reductn		0			0	0		0		0	0	
Storage Cap Reductn		0			0	0		0		0	0	
Reduced v/c Ratio		0.77			0.43	0.33		0.34		0.76	0.13	

Intersection Summary

Area Type: CBD

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 42 (35%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 31.4

Intersection LOS: C

Intersection Capacity Utilization 62.7%

ICU Level of Service B



























Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: 9th St & Main Street

 ø2 (R)												
46 s				50 s						24 s		
 ø5		 ø6 (R)										
9.5 s		36.5 s				50 s						

















Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	8.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings
10: 8th St & Main Street/Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	577	39	8	292	14	65	47	40	56	19	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	13	13	13	10	10	10	10	10	10
Grade (%)		0%			0%			1%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.987			0.992			0.964			0.954	
Flt Protected		0.996			0.998			0.981			0.978	
Satd. Flow (prot)	0	*3502	0	0	*1772	0	0	*1760	0	0	*1624	0
Flt Permitted		0.877			0.961			0.820			0.739	
Satd. Flow (perm)	0	*3021	0	0	*1733	0	0	*1405	0	0	*1397	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		552			555			340			310	
Travel Time (s)		8.5			8.2			9.3			8.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.66	0.89	0.57	0.50	0.81	0.58	0.86	0.69	0.77	0.88	0.68	0.83
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	4%	2%	0%	0%	3%	0%	2%	0%	5%	2%	0%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0	0	0	0	0	0	0			
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	68	648	68	16	360	24	76	68	52	64	28	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	784	0	0	400	0	0	196	0	0	140	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.5	14.5		14.5	14.5		12.5	12.5		12.5	12.5	
Total Split (s)	22.5	22.5		22.5	22.5		15.5	15.5		15.5	15.5	
Total Split (%)	37.5%	37.5%		37.5%	37.5%		25.8%	25.8%		25.8%	25.8%	
Maximum Green (s)	18.0	18.0		18.0	18.0		10.0	10.0		10.0	10.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)		-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)		2.5			2.5			3.5			3.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	

Lane Group ø9

Lane Configurations

Volume (vph)

Ideal Flow (vphpl)

Lane Width (ft)

Grade (%)

Storage Length (ft)

Storage Lanes

Taper Length (ft)

Lane Util. Factor

Ped Bike Factor

Frt

Flt Protected

Satd. Flow (prot)

Flt Permitted

Satd. Flow (perm)

Right Turn on Red

Satd. Flow (RTOR)

Link Speed (mph)

Link Distance (ft)

Travel Time (s)

Confl. Peds. (#/hr)

Confl. Bikes (#/hr)

Peak Hour Factor

Growth Factor

Heavy Vehicles (%)

Bus Blockages (#/hr)

Parking (#/hr)

Mid-Block Traffic (%)

Adj. Flow (vph)

Shared Lane Traffic (%)

Lane Group Flow (vph)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phase

Switch Phase

Minimum Initial (s) 1.0

Minimum Split (s) 22.0

Total Split (s) 22.0

Total Split (%) 37%

Maximum Green (s) 20.0

Yellow Time (s) 2.0

All-Red Time (s) 0.0

Lost Time Adjust (s)

Total Lost Time (s)

Lead/Lag

Lead-Lag Optimize?













Vehicle Extension (s) 3.0

Minimum Gap (s) 3.0

Lanes, Volumes, Timings
10: 8th St & Main Street/Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		22.3			22.3			11.7			11.7	
Actuated g/C Ratio		0.37			0.37			0.20			0.20	
v/c Ratio		0.70			0.62			0.72			0.52	
Control Delay		16.2			14.7			40.0			29.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		16.2			14.7			40.0			29.1	
LOS		B			B			D			C	
Approach Delay		16.2			14.7			40.0			29.1	
Approach LOS		B			B			D			C	
Queue Length 50th (ft)		148			121			66			45	
Queue Length 95th (ft)		204			144			92			67	
Internal Link Dist (ft)		472			475			260			230	
Turn Bay Length (ft)												
Base Capacity (vph)		1124			645			281			279	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.70			0.62			0.70			0.50	

Intersection Summary

Area Type: CBD

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 36 (60%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 20.1

Intersection Capacity Utilization 57.7%








Analysis Period (min) 15

* User Entered Value

Intersection LOS: C

ICU Level of Service B

Splits and Phases: 10: 8th St & Main Street/Main Street

 p2 (R)		 p4	 p9
22.5 s		15.5 s	22 s
 p6 (R)		 p8	
22.5 s		15.5 s	

Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

















HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings

Stroudsburg Boro. A.M. Peak Hour With Peds

11: Seventh St/7th St & Main Street /Main Street

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	352	108	18	227	13	64	43	56	37	66	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	13	13	13	14	14	14	11	11	11
Grade (%)		-1%			2%			4%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.966			0.991			0.954			0.974	
Flt Protected		0.997			0.995			0.981			0.983	
Satd. Flow (prot)	0	2748	0	0	1478	0	0	1604	0	0	1432	0
Flt Permitted		0.925			0.926			0.738			0.777	
Satd. Flow (perm)	0	2549	0	0	1375	0	0	1207	0	0	1132	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		555			308			456			331	
Travel Time (s)		15.1			8.4			12.4			9.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.61	0.88	0.87	0.64	0.87	0.65	0.80	0.72	0.78	0.54	0.69	0.78
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	6%	6%	2%	0%	6%	0%	5%	0%	7%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0	0	0	0				0	0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	28	400	124	28	261	20	80	60	72	69	96	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	552	0	0	309	0	0	212	0	0	205	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		12.0	12.0		12.0	12.0	
Total Split (s)	55.0	55.0		55.0	55.0		43.0	43.0		43.0	43.0	
Total Split (%)	45.8%	45.8%		45.8%	45.8%		35.8%	35.8%		35.8%	35.8%	
Maximum Green (s)	50.0	50.0		50.0	50.0		38.0	38.0		38.0	38.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)		3.0			3.0			3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	













Lane Group	ø9
Lane Configurations	
Volume (vph)	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Taper Length (ft)	
Lane Util. Factor	
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	9
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	1.0
Minimum Split (s)	22.0
Total Split (s)	22.0
Total Split (%)	18%
Maximum Green (s)	20.0
Yellow Time (s)	2.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Minimum Gap (s)	3.0

Lanes, Volumes, Timings

Stroudsburg Boro. A.M. Peak Hour With Peds

11: Seventh St/7th St & Main Street /Main Street

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		64.2			64.2			27.8			27.8	
Actuated g/C Ratio		0.54			0.54			0.23			0.23	
v/c Ratio		0.40			0.42			0.76			0.79	
Control Delay		12.9			9.6			48.7			62.9	
Queue Delay		0.0			0.4			0.0			0.0	
Total Delay		12.9			10.0			48.7			62.9	
LOS		B			A			D			E	
Approach Delay		12.9			10.0			48.7			62.9	
Approach LOS		B			A			D			E	
Queue Length 50th (ft)		121			38			112			150	
Queue Length 95th (ft)		152			60			124			153	
Internal Link Dist (ft)		475			228			376			251	
Turn Bay Length (ft)												
Base Capacity (vph)		1364			736			402			377	
Starvation Cap Reductn		0			127			0			0	
Spillback Cap Reductn		7			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.41			0.51			0.53			0.54	

Intersection Summary

Area Type: CBD

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 26.1






Intersection LOS: C

Intersection Capacity Utilization 53.2%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 11: Seventh St/7th St & Main Street /Main Street

 ø2 (R)	 ø4	 ø9
55 s	43 s	22 s
 ø6 (R)	 ø8	
55 s	43 s	

Lane Group	ø9
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Time Before Reduce (s)	0.0
------------------------	-----

Time To Reduce (s)	0.0
--------------------	-----

Recall Mode	Ped
-------------	-----

Walk Time (s)	9.0
---------------	-----

Flash Dont Walk (s)	11.0
---------------------	------

Pedestrian Calls (#/hr)	15
-------------------------	----

Act Effct Green (s)	
---------------------	--

Actuated g/C Ratio	
--------------------	--

v/c Ratio	
-----------	--

Control Delay	
---------------	--

Queue Delay	
-------------	--

Total Delay	
-------------	--

LOS	
-----	--

Approach Delay	
----------------	--

Approach LOS	
--------------	--

Queue Length 50th (ft)	
------------------------	--

Queue Length 95th (ft)	
------------------------	--

Internal Link Dist (ft)	
-------------------------	--

Turn Bay Length (ft)	
----------------------	--

Base Capacity (vph)	
---------------------	--

Starvation Cap Reductn	
------------------------	--

Spillback Cap Reductn	
-----------------------	--

Storage Cap Reductn	
---------------------	--

Reduced v/c Ratio	
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Intersection Summary	
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HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings
12: Seventh St & Ann St

Stroudsburg Boro. A.M. Peak Hour With Peds













Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	13	133	21	155	227	0	0	189	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	16	16	16	16	16	16	10	10	10
Grade (%)		0%			2%			-5%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.981						0.974	
Flt Protected					0.995			0.981				
Satd. Flow (prot)	0	0	0	0	1783	0	0	2131	0	0	1530	0
Flt Permitted					0.995			0.678				
Satd. Flow (perm)	0	0	0	0	1783	0	0	1473	0	0	1530	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)					15						23	
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		273			284			513			456	
Travel Time (s)		7.4			7.7			10.0			12.4	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.65	0.90	0.75	0.95	0.92	0.92	0.92	0.76	0.70
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	15%	2%	14%	1%	2%	0%	0%	2%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)				0	0	0					0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	0	0	20	148	28	163	247	0	0	249	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	196	0	0	410	0	0	309	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					6		3	8			4	
Permitted Phases				6			8					
Detector Phase				6	6		3	8			4	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	7.0			7.0	
Minimum Split (s)				23.0	23.0		10.5	20.5			20.5	
Total Split (s)				23.5	23.5		10.5	36.5			26.0	
Total Split (%)				39.2%	39.2%		17.5%	60.8%			43.3%	
Maximum Green (s)				18.5	18.5		5.0	31.0			20.5	
Yellow Time (s)				3.5	3.5		4.0	4.0			4.0	
All-Red Time (s)				1.5	1.5		1.5	1.5			1.5	
Lost Time Adjust (s)					-1.0			-1.0			-1.0	
Total Lost Time (s)					4.0			4.5			4.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Minimum Gap (s)				3.0	3.0		3.0	3.0			3.0	

Lanes, Volumes, Timings
12: Seventh St & Ann St

Stroudsburg Boro. A.M. Peak Hour With Peds

Existing Year 2013

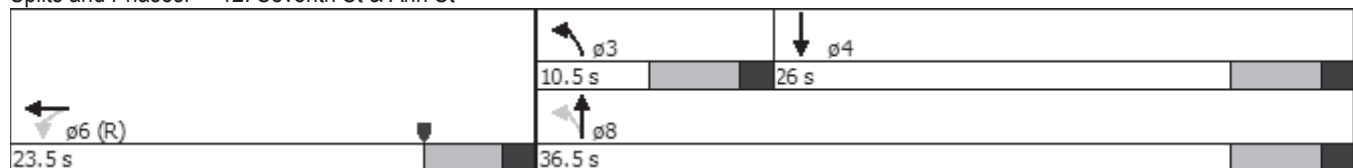
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)				0.0	0.0		0.0	0.0			0.0	
Time To Reduce (s)				0.0	0.0		0.0	0.0			0.0	
Recall Mode				C-Max	C-Max		None	None			None	
Walk Time (s)				7.0	7.0			7.0			7.0	
Flash Dont Walk (s)				11.0	11.0			8.0			8.0	
Pedestrian Calls (#/hr)				8	8			1			3	
Act Effct Green (s)					25.8			25.7			25.7	
Actuated g/C Ratio					0.43			0.43			0.43	
v/c Ratio					0.25			0.65			0.46	
Control Delay					13.2			17.9			11.1	
Queue Delay					0.0			0.0			0.0	
Total Delay					13.2			17.9			11.1	
LOS					B			B			B	
Approach Delay					13.2			17.9			11.1	
Approach LOS					B			B			B	
Queue Length 50th (ft)					41			108			61	
Queue Length 95th (ft)					94			155			76	
Internal Link Dist (ft)		193			204			433			376	
Turn Bay Length (ft)												
Base Capacity (vph)					775			785			692	
Starvation Cap Reductn					0			0			0	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.25			0.52			0.45	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 6:WBTL, Start of Yellow
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 14.6
Intersection Capacity Utilization 52.8%
Analysis Period (min) 15

Intersection LOS: B
ICU Level of Service A

Splits and Phases: 12: Seventh St & Ann St


















HCM 2010 Signalized Intersection Summary

12: Seventh St & Ann St

Stroudsburg Boro. A.M. Peak Hour With Peds
















Existing Year 2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	13	133	21	155	227	0	0	189	42
Number				1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj				1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00	0.90
Adj Sat Flow veh/h/ln				195.6	186.2	195.6	202.5	199.3	0.0	0.0	187.0	190.0
Lanes				0	1	0	0	1	0	0	1	0
Cap, veh/h				74	546	103	284	393	0	0	474	114
Arrive On Green				0.44	0.44	0.42	0.36	0.36	0.00	0.00	0.72	0.68
Sat Flow, veh/h				166	1228	232	469	1087	0	0	1311	316
Grp Volume(v), veh/h				196	0	0	410	0	0	0	0	309
Grp Sat Flow(s),veh/h/ln				1627	0	0	1556	0	0	0	0	1627
Q Serve(g_s), s				3.3	0.0	0.0	0.1	0.0	0.0	0.0	0.0	3.8
Cycle Q Clear(g_c), s				3.3	0.0	0.0	9.9	0.0	0.0	0.0	0.0	3.8
Prop In Lane				0.10		0.14	0.40		0.00	0.00		0.19
Lane Grp Cap(c), veh/h				724	0	0	677	0	0	0	0	588
V/C Ratio(X)				0.27	0.00	0.00	0.61	0.00	0.00	0.00	0.00	0.53
Avail Cap(c_a), veh/h				724	0	0	1244	0	0	0	0	798
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.52
Uniform Delay (d), s/veh				7.7	0.0	0.0	11.9	0.0	0.0	0.0	0.0	4.6
Incr Delay (d2), s/veh				0.9	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln				1.3	0.0	0.0	3.0	0.0	0.0	0.0	0.0	1.0
Lane Grp Delay (d), s/veh				8.7	0.0	0.0	12.8	0.0	0.0	0.0	0.0	4.9
Lane Grp LOS				A			B					A
Approach Vol, veh/h					196			410			309	
Approach Delay, s/veh					8.7			12.8			4.9	
Approach LOS					A			B			A	
Timer												
Assigned Phs					6		3	8			4	
Phs Duration (G+Y+Rc), s					23.5		0.0	20.3			20.3	
Change Period (Y+Rc), s					5.0		5.5	5.5			5.5	
Max Green Setting (Gmax), s					18.5		5.0	31.0			20.5	
Max Q Clear Time (g_c+l1), s					5.3		0.0	11.9			5.8	
Green Ext Time (p_c), s					0.4		0.0	2.9			2.7	
Intersection Summary												
HCM 2010 Ctrl Delay				9.3								
HCM 2010 LOS				A								
Notes												

Lanes, Volumes, Timings
13: 6th St & Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	104	504	14	8	244	45	10	69	36	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	16	16	16	11	11	11	12	12	12
Grade (%)		-1%			2%			-1%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995			0.977			0.957				
Flt Protected		0.989			0.998			0.996				
Satd. Flow (prot)	0	2867	0	0	1619	0	0	1569	0	0	0	0
Flt Permitted		0.752			0.973			0.996				
Satd. Flow (perm)	0	2180	0	0	1579	0	0	1569	0	0	0	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)		5			14							
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		308			744			383			229	
Travel Time (s)		6.0			14.5			7.5			4.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.70	0.96	0.58	0.67	0.86	0.75	0.63	0.66	0.64	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	3%	7%	0%	5%	0%	0%	0%	3%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0	0	0	0						
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	149	525	24	12	284	60	16	105	56	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	698	0	0	356	0	0	177	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA				
Protected Phases		2			6			4				
Permitted Phases	2			6			4					
Detector Phase	2	2		6	6		4	4				
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0				
Minimum Split (s)	15.0	15.0		15.0	15.0		12.0	12.0				
Total Split (s)	70.0	70.0		70.0	70.0		31.0	31.0				
Total Split (%)	58.3%	58.3%		58.3%	58.3%		25.8%	25.8%				
Maximum Green (s)	65.0	65.0		65.0	65.0		26.0	26.0				
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5				
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5				
Lost Time Adjust (s)		-1.0			-1.0			-1.0				
Total Lost Time (s)		4.0			4.0			4.0				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0				
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0				

Lane Group ø9

Lane Configurations

Volume (vph)

Ideal Flow (vphpl)

Lane Width (ft)

Grade (%)

Storage Length (ft)

Storage Lanes

Taper Length (ft)

Lane Util. Factor

Ped Bike Factor

Frt

Flt Protected

Satd. Flow (prot)

Flt Permitted

Satd. Flow (perm)

Right Turn on Red

Satd. Flow (RTOR)

Link Speed (mph)

Link Distance (ft)

Travel Time (s)

Confl. Peds. (#/hr)

Confl. Bikes (#/hr)

Peak Hour Factor

Growth Factor

Heavy Vehicles (%)

Bus Blockages (#/hr)

Parking (#/hr)

Mid-Block Traffic (%)

Adj. Flow (vph)

Shared Lane Traffic (%)

Lane Group Flow (vph)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phase

Switch Phase

Minimum Initial (s) 1.0

Minimum Split (s) 19.0

Total Split (s) 19.0

Total Split (%) 16%

Maximum Green (s) 17.0

Yellow Time (s) 2.0

All-Red Time (s) 0.0

Lost Time Adjust (s)

Total Lost Time (s)

Lead/Lag













Lead-Lag Optimize?

Vehicle Extension (s) 3.0

Minimum Gap (s) 3.0

Lanes, Volumes, Timings
13: 6th St & Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None				
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		73.3			73.3			19.7				
Actuated g/C Ratio		0.61			0.61			0.16				
v/c Ratio		0.52			0.37			0.69				
Control Delay		12.2			11.3			60.4				
Queue Delay		0.2			0.0			0.0				
Total Delay		12.4			11.3			60.4				
LOS		B			B			E				
Approach Delay		12.4			11.3			60.4				
Approach LOS		B			B			E				
Queue Length 50th (ft)		94			118			131				
Queue Length 95th (ft)		120			130			136				
Internal Link Dist (ft)		228			664			303			149	
Turn Bay Length (ft)												
Base Capacity (vph)		1332			969			353				
Starvation Cap Reductn		153			0			0				
Spillback Cap Reductn		0			14			0				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.59			0.37			0.50				

Intersection Summary

Area Type: CBD

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 5 (4%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 19.0

Intersection Capacity Utilization 54.2%

Analysis Period (min) 15

Intersection LOS: B

ICU Level of Service A

Splits and Phases: 13: 6th St & Main Street














 2 (R)	 4	 9
70 s	31 s	19 s
 6 (R)		
70 s		

Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	10.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings
14: Ann St & Broad St/5th St & Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

								
Lane Group	EBT	EBR	NBL2	NBR	SBL	SBT	SBR2	ø9
Lane Configurations								
Volume (vph)	337	27	173	440	87	376	263	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	11	10	11	10	10	11	
Grade (%)	-5%					2%		
Storage Length (ft)		0		0	0			
Storage Lanes		0		1	1			
Taper Length (ft)					25			
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor								
Frt	0.986			0.850			0.850	
Flt Protected			0.950		0.950			
Satd. Flow (prot)	*3372	0	1494	1371	*1752	*1793	1337	
Flt Permitted			0.275		0.950			
Satd. Flow (perm)	*3372	0	432	1371	*1752	*1792	1337	
Right Turn on Red				No	No		Yes	
Satd. Flow (RTOR)							325	
Link Speed (mph)	25					25		
Link Distance (ft)	744					298		
Travel Time (s)	20.3					8.2		
Confl. Peds. (#/hr)								
Confl. Bikes (#/hr)								
Peak Hour Factor	0.87	0.68	0.80	0.92	0.64	0.88	0.81	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	2%	0%	2%	3%	2%	5%	4%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	
Parking (#/hr)								
Mid-Block Traffic (%)	0%					0%		
Adj. Flow (vph)	387	40	216	478	136	427	325	
Shared Lane Traffic (%)								
Lane Group Flow (vph)	427	0	216	478	136	427	325	
Turn Type	NA		custom	custom	pm+pt	NA	custom	
Protected Phases	8		1	6	5	2		9
Permitted Phases			6		2		2 8	
Detector Phase	8		1	6	5	2	2 8	
Switch Phase								
Minimum Initial (s)	7.0		5.0	10.0	5.0	10.0		1.0
Minimum Split (s)	14.0		12.5	16.5	11.5	16.5		22.0
Total Split (s)	25.0		23.5	61.5	11.5	49.5		22.0
Total Split (%)	20.8%		19.6%	51.3%	9.6%	41.3%		18%
Maximum Green (s)	18.0		17.0	55.0	5.0	43.0		20.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0		2.0
All-Red Time (s)	3.0		2.5	2.5	2.5	2.5		0.0
Lost Time Adjust (s)	-2.5		0.0	-2.5	-2.5	-2.5		
Total Lost Time (s)	4.5		6.5	4.0	4.0	4.0		
Lead/Lag			Lead	Lag	Lead	Lag		
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		3.0
Minimum Gap (s)	3.0		3.0	3.0	3.0	3.0		3.0

Lanes, Volumes, Timings
14: Ann St & Broad St/5th St & Main Street

Stroudsburg Boro. A.M. Peak Hour With Peds

Existing Year 2013

	→	↘	↙	↗	↘	↓	↙	
Lane Group	EBT	EBR	NBL2	NBR	SBL	SBT	SBR2	ø9
Time Before Reduce (s)	0.0		0.0	0.0	0.0	0.0		0.0
Time To Reduce (s)	0.0		0.0	0.0	0.0	0.0		0.0
Recall Mode	None		None	None	None	C-Max		Ped
Walk Time (s)								7.0
Flash Dont Walk (s)								13.0
Pedestrian Calls (#/hr)								15
Act Effct Green (s)	20.0		66.3	57.6	56.9	49.0	71.0	
Actuated g/C Ratio	0.17		0.55	0.48	0.47	0.41	0.59	
v/c Ratio	0.76		0.60	0.73	0.16	0.58	0.35	
Control Delay	43.6		21.2	32.8	12.1	30.7	4.1	
Queue Delay	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	43.6		21.2	32.8	12.1	30.7	4.1	
LOS	D		C	C	B	C	A	
Approach Delay	43.6					18.1		
Approach LOS	D					B		
Queue Length 50th (ft)	144		83	288	48	246	13	
Queue Length 95th (ft)	206		113	429	49	327	42	
Internal Link Dist (ft)	664					218		
Turn Bay Length (ft)			190					
Base Capacity (vph)	576		391	658	830	732	927	
Starvation Cap Reductn	0		0	0	0	0	0	
Spillback Cap Reductn	0		0	0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	0	
Reduced v/c Ratio	0.74		0.55	0.73	0.16	0.58	0.35	

Intersection Summary

Area Type: CBD

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 105 (88%), Referenced to phase 2:SBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 27.4

Intersection LOS: C







Intersection Capacity Utilization 57.3%

ICU Level of Service B

Analysis Period (min) 15

* User Entered Value

Splits and Phases: 14: Ann St & Broad St/5th St & Main Street


















 ø1	 ø2 (R)	 ø9
23.5 s	49.5 s	22 s
 ø5	 ø6	 ø8
11.5 s	61.5 s	25 s

HCM 2010 methodology does not support more than 4 approaches.

Lanes, Volumes, Timings
20: McConnell St & 4th St













Stroudsburg Boro. A.M. Peak Hour With Peds

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											  	
Volume (vph)	0	18	8	88	1	0	0	0	0	62	529	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	14	14	14	12	12	12	14	14	14
Grade (%)		1%			-1%			0%			1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor												
Frt		0.939										
Flt Protected					0.953						0.994	
Satd. Flow (prot)	0	*862	0	*619	1665	0	0	0	0	0	*1459	0
Flt Permitted					0.696						0.994	
Satd. Flow (perm)	0	*862	0	*606	1216	0	0	0	0	0	*1459	0
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)		20										
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		163			256			357			512	
Travel Time (s)		4.4			7.0			7.6			14.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.75	0.40	0.82	0.92	0.92	0.92	0.92	0.92	0.74	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	24	20	107	1	0	0	0	0	84	575	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	44	0	0	108	0	0	0	0	0	659	0
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		7.0		7.0	7.0					10.0	10.0	
Minimum Split (s)		22.0		22.0	22.0					21.0	21.0	
Total Split (s)		22.0		22.0	22.0					38.0	38.0	
Total Split (%)		36.7%		36.7%	36.7%					63.3%	63.3%	
Maximum Green (s)		17.0		17.0	17.0					33.0	33.0	
Yellow Time (s)		3.5		3.5	3.5					3.5	3.5	
All-Red Time (s)		1.5		1.5	1.5					1.5	1.5	
Lost Time Adjust (s)		-1.0			0.0						-1.0	
Total Lost Time (s)		4.0			5.0						4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	
Minimum Gap (s)		3.0		3.0	3.0					3.0	3.0	

Lanes, Volumes, Timings
20: McConnell St & 4th St

Stroudsburg Boro. A.M. Peak Hour With Peds
Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)		0.0		0.0	0.0					0.0	0.0	
Time To Reduce (s)		0.0		0.0	0.0					0.0	0.0	
Recall Mode		None		None	None					C-Max	C-Max	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		10.0		10.0	10.0					9.0	9.0	
Pedestrian Calls (#/hr)		8		1	1					8	8	
Act Effct Green (s)		12.2			11.2							43.0
Actuated g/C Ratio		0.20			0.19							0.72
v/c Ratio		0.23			0.48							0.63
Control Delay		15.0			27.8							7.4
Queue Delay		0.0			0.0							0.0
Total Delay		15.0			27.8							7.4
LOS		B			C							A
Approach Delay		15.0			27.8							7.4
Approach LOS		B			C							A
Queue Length 50th (ft)		7			36							10
Queue Length 95th (ft)		21			67							#185
Internal Link Dist (ft)		83			176			277				432
Turn Bay Length (ft)												
Base Capacity (vph)		272			344							1046
Starvation Cap Reductn		0			0							0
Spillback Cap Reductn		0			0							0
Storage Cap Reductn		0			0							0
Reduced v/c Ratio		0.16			0.31							0.63

Intersection Summary

Area Type: CBD

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 31 (52%), Referenced to phase 6:SBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 10.5

Intersection LOS: B

Intersection Capacity Utilization 37.9%

ICU Level of Service A

Analysis Period (min) 15

* User Entered Value

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 20: McConnell St & 4th St



















HCM 2010 Signalized Intersection Summary

20: McConnell St & 4th St

Stroudsburg Boro. A.M. Peak Hour With Peds


















Existing Year 2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											 	
Volume (veh/h)	0	18	8	88	1	0	0	0	0	62	529	0
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	177.0	177.0	178.7	170.3	0.0				177.0	172.4	0.0
Lanes	0	1	0	0	1	0				0	2	0
Cap, veh/h	0	137	115	284	2	0				286	2062	0
Arrive On Green	0.00	0.15	0.13	0.15	0.13	0.00				0.68	0.68	0.00
Sat Flow, veh/h	0	894	745	1043	14	0				417	3011	0
Grp Volume(v), veh/h	0	0	44	108	0	0				343	316	0
Grp Sat Flow(s),veh/h/ln	0	0	1638	1057	0	0				1704	1724	0
Q Serve(g_s), s	0.0	0.0	1.2	4.1	0.0	0.0				3.9	3.5	0.0
Cycle Q Clear(g_c), s	0.0	0.0	1.2	5.2	0.0	0.0				3.9	3.5	0.0
Prop In Lane	0.00		0.45	0.99		0.00				0.24		0.00
Lane Grp Cap(c), veh/h	0	0	252	307	0	0				1167	1181	0
V/C Ratio(X)	0.00	0.00	0.17	0.35	0.00	0.00				0.29	0.27	0.00
Avail Cap(c_a), veh/h	0	0	594	567	0	0				1167	1181	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00				1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	18.5	21.0	0.0	0.0				3.1	3.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.3	0.7	0.0	0.0				0.6	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.0	0.0	0.5	1.2	0.0	0.0				1.3	1.1	0.0
Lane Grp Delay (d), s/veh	0.0	0.0	18.8	21.6	0.0	0.0				3.7	3.6	0.0
Lane Grp LOS			B	C						A	A	
Approach Vol, veh/h		44			108						659	
Approach Delay, s/veh		18.8			21.6						3.7	
Approach LOS		B			C						A	
Timer												
Assigned Phs		4			8						6	
Phs Duration (G+Y+Rc), s		11.6			11.6						38.0	
Change Period (Y+Rc), s		5.0			5.0						5.0	
Max Green Setting (Gmax), s		17.0			17.0						33.0	
Max Q Clear Time (g_c+I1), s		3.2			7.2						0.0	
Green Ext Time (p_c), s		0.4			0.3						0.0	
Intersection Summary												
HCM 2010 Ctrl Delay			6.9									
HCM 2010 LOS			A									
Notes												

Lanes, Volumes, Timings
21: McConnell St & 3rd St

Stroudsburg Boro. A.M. Peak Hour With Peds













Existing Year 2013

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											 	
Volume (vph)	0	64	49	13	92	0	0	0	0	4	662	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	12	12	12	13	11	14
Grade (%)		1%			-2%			0%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		175
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor												
Frt		0.935										0.850
Flt Protected					0.992						0.999	
Satd. Flow (prot)	0	*1762	0	0	*1857	0	0	0	0	0	*1931	1513
Flt Permitted					0.932						0.999	
Satd. Flow (perm)	0	*1762	0	0	*1857	0	0	0	0	0	*1931	1513
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)		64										88
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		348			248			268			452	
Travel Time (s)		9.5			6.8			7.3			7.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.94	0.77	0.65	0.92	0.92	0.92	0.92	0.92	0.33	0.86	0.81
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	6%	2%	8%	3%	0%	0%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	68	64	20	100	0	0	0	0	12	770	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	132	0	0	120	0	0	0	0	0	782	88
Turn Type		NA		Perm	NA					Perm	NA	Perm
Protected Phases		4			8						6	
Permitted Phases				8						6		6
Detector Phase		4		8	8					6	6	6
Switch Phase												
Minimum Initial (s)		7.0		7.0	7.0					10.0	10.0	10.0
Minimum Split (s)		28.0		28.0	28.0					21.0	21.0	21.0
Total Split (s)		28.0		28.0	28.0					32.0	32.0	32.0
Total Split (%)		46.7%		46.7%	46.7%					53.3%	53.3%	53.3%
Maximum Green (s)		23.0		23.0	23.0					27.0	27.0	27.0
Yellow Time (s)		3.0		3.0	3.0					3.5	3.5	3.5
All-Red Time (s)		2.0		2.0	2.0					1.5	1.5	1.5
Lost Time Adjust (s)		-1.0			-1.0						-1.0	-1.0
Total Lost Time (s)		4.0			4.0						4.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	3.0
Minimum Gap (s)		3.0		3.0	3.0					3.0	3.0	3.0

Lanes, Volumes, Timings
21: McConnell St & 3rd St

Stroudsburg Boro. A.M. Peak Hour With Peds

Existing Year 2013

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Time Before Reduce (s)		0.0		0.0	0.0					0.0	0.0	0.0
Time To Reduce (s)		0.0		0.0	0.0					0.0	0.0	0.0
Recall Mode		None		None	None					C-Max	C-Max	C-Max
Walk Time (s)		9.0		9.0	9.0					7.0	7.0	7.0
Flash Dont Walk (s)		14.0		14.0	14.0					9.0	9.0	9.0
Pedestrian Calls (#/hr)		5		5	5					1	1	1
Act Effct Green (s)		12.5			12.5						42.7	42.7
Actuated g/C Ratio		0.21			0.21						0.71	0.71
v/c Ratio		0.32			0.31						0.57	0.08
Control Delay		11.9			20.3						10.7	2.3
Queue Delay		0.0			0.0						0.0	0.0
Total Delay		11.9			20.3						10.7	2.3
LOS		B			C						B	A
Approach Delay		11.9			20.3						9.9	
Approach LOS		B			C						A	
Queue Length 50th (ft)		22			39						58	0
Queue Length 95th (ft)		43			56						#216	15
Internal Link Dist (ft)		268			168			188			372	
Turn Bay Length (ft)												175
Base Capacity (vph)		743			742						1373	1101
Starvation Cap Reductn		0			0						0	0
Spillback Cap Reductn		0			0						0	0
Storage Cap Reductn		0			0						0	0
Reduced v/c Ratio		0.18			0.16						0.57	0.08

Intersection Summary

Area Type: CBD

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 13 (22%), Referenced to phase 6:SWTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.57

Intersection Signal Delay: 11.2

Intersection LOS: B

Intersection Capacity Utilization 40.0%

ICU Level of Service A

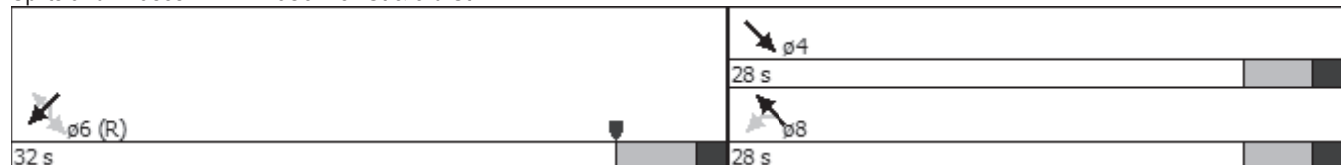
Analysis Period (min) 15

* User Entered Value

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 21: McConnell St & 3rd St



















HCM 2010 Signalized Intersection Summary

21: McConnell St & 3rd St

Stroudsburg Boro. A.M. Peak Hour With Peds


















Existing Year 2013

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	64	49	13	92	0	0	0	0	4	662	71
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	170.1	170.1	172.7	164.5	0.0				178.7	166.9	173.5
Lanes	0	1	0	0	1	0				0	2	1
Cap, veh/h	0	142	133	121	227	0				31	2108	946
Arrive On Green	0.00	0.18	0.15	0.18	0.18	0.00				0.64	0.64	0.64
Sat Flow, veh/h	0	807	760	143	1293	0				49	3287	1475
Grp Volume(v), veh/h	0	0	132	120	0	0				409	373	88
Grp Sat Flow(s),veh/h/ln	0	0	1567	1436	0	0				1667	1669	1475
Q Serve(g_s), s	0.0	0.0	3.3	0.2	0.0	0.0				5.1	4.5	1.0
Cycle Q Clear(g_c), s	0.0	0.0	3.3	3.5	0.0	0.0				5.1	4.5	1.0
Prop In Lane	0.00		0.48	0.17		0.00				0.03		1.00
Lane Grp Cap(c), veh/h	0	0	275	348	0	0				1069	1070	946
V/C Ratio(X)	0.00	0.00	0.48	0.34	0.00	0.00				0.38	0.35	0.09
Avail Cap(c_a), veh/h	0	0	861	917	0	0				1069	1070	946
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	16.4	16.0	0.0	0.0				3.7	3.6	3.0
Incr Delay (d2), s/veh	0.0	0.0	1.3	0.6	0.0	0.0				1.0	0.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.0	0.0	1.3	1.1	0.0	0.0				1.6	1.4	0.3
Lane Grp Delay (d), s/veh	0.0	0.0	17.7	16.6	0.0	0.0				4.8	4.5	3.2
Lane Grp LOS			B	B						A	A	A
Approach Vol, veh/h		132			120						870	
Approach Delay, s/veh		17.7			16.6						4.5	
Approach LOS		B			B						A	
Timer												
Assigned Phs		4			8						6	
Phs Duration (G+Y+Rc), s		11.7			11.7						32.0	
Change Period (Y+Rc), s		5.0			5.0						5.0	
Max Green Setting (Gmax), s		23.0			23.0						27.0	
Max Q Clear Time (g_c+I1), s		5.3			5.5						7.1	
Green Ext Time (p_c), s		0.8			0.8						2.2	
Intersection Summary												
HCM 2010 Ctrl Delay			7.4									
HCM 2010 LOS			A									
Notes												

Lanes, Volumes, Timings
24: 5th St & Sarah St

Stroudsburg Boro. A.M. Peak Hour With Peds













Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	62	34	72	2	243	99	27	53	1	18	241	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	12	12	12	11	11	11	16	16	16
Grade (%)		-6%			7%			14%			-10%	
Storage Length (ft)	0		0	0		150	0		0	0		0
Storage Lanes	0		0	0		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.939				0.850		0.999			0.965	
Flt Protected		0.984			0.999			0.985			0.997	
Satd. Flow (prot)	0	1660	0	0	1632	1389	0	1492	0	0	1894	0
Flt Permitted		0.807			0.996			0.827			0.974	
Satd. Flow (perm)	0	1361	0	0	1627	1389	0	1253	0	0	1850	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		92				159		1			28	
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		447			479			476			360	
Travel Time (s)		12.2			9.3			9.3			7.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.77	0.78	0.50	0.75	0.64	0.96	0.83	0.92	0.56	0.74	0.75
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	1%	1%	0%	2%	0%	0%	5%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)	0	0	0									
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	68	44	92	4	324	155	28	64	1	32	326	124
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	204	0	0	328	155	0	93	0	0	482	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	10.5	28.5		28.5	28.5	28.5	26.0	26.0		26.0	26.0	
Total Split (s)	10.5	39.0		28.5	28.5	28.5	26.0	26.0		26.0	26.0	
Total Split (%)	16.2%	60.0%		43.8%	43.8%	43.8%	40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	5.0	33.5		23.0	23.0	23.0	19.0	19.0		19.0	19.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	5.0	5.0		5.0	5.0	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.5			-1.5	-1.5		-1.5			-1.5	
Total Lost Time (s)		4.0			4.0	4.0		5.5			5.5	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	5.0	5.0		5.0	5.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	2.5	2.5		2.5	2.5	

Lanes, Volumes, Timings
24: 5th St & Sarah St

Stroudsburg Boro. A.M. Peak Hour With Peds

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		3.0	3.0	3.0	26.0	26.0		26.0	26.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	10.0	10.0		10.0	10.0	
Recall Mode	None	None		None	None	None	Min	Min		Min	Min	
Walk Time (s)		11.0		11.0	11.0	11.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		12.0		12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)		1		3	3	3	1	1		5	5	
Act Effct Green (s)		16.3			16.3	16.3		15.8			15.8	
Actuated g/C Ratio		0.39			0.39	0.39		0.38			0.38	
v/c Ratio		0.35			0.52	0.24		0.20			0.68	
Control Delay		7.6			13.9	3.2		10.9			16.4	
Queue Delay		0.0			0.0	0.0		0.0			0.0	
Total Delay		7.6			13.9	3.2		10.9			16.4	
LOS		A			B	A		B			B	
Approach Delay		7.6			10.5			10.9			16.4	
Approach LOS		A			B			B			B	
Queue Length 50th (ft)		17			57	0		13			79	
Queue Length 95th (ft)		42			97	8		42			152	
Internal Link Dist (ft)		367			399			396			280	
Turn Bay Length (ft)						150						
Base Capacity (vph)		1158			989	906		637			955	
Starvation Cap Reductn		0			0	0		0			0	
Spillback Cap Reductn		0			0	0		0			0	
Storage Cap Reductn		0			0	0		0			0	
Reduced v/c Ratio		0.18			0.33	0.17		0.15			0.50	

Intersection Summary

Area Type: CBD

Cycle Length: 65

Actuated Cycle Length: 42

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 12.3













Intersection Capacity Utilization 58.3%

Analysis Period (min) 15

Intersection LOS: B

ICU Level of Service B

Splits and Phases: 24: 5th St & Sarah St






















					
ø2			ø4		
39 s			26 s		
					
ø5	ø6		ø8		
10.5 s	28.5 s		26 s		

HCM 2010 analysis expects stop-line detection. Detectors can not be further than 20 feet from the stop bar.

Lanes, Volumes, Timings
8: Dreher Ave/School Drive & Main Street

Stroudsburg Boro. P.M. Peak Hour With Peds

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	399	39	157	559	107	36	28	137	116	32	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	14	12	11	12	14	12	14	16	14	14	12
Grade (%)		-1%			0%			1%			1%	
Storage Length (ft)	145		0	125		210	85		0	105		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.988				0.850		0.872			0.902	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1337	1728	0	1525	1613	1397	1483	1522	0	1567	1488	0
Flt Permitted	0.320			0.195			0.669			0.389		
Satd. Flow (perm)	451	1728	0	313	1613	1397	1044	1522	0	642	1488	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				80		178			58	
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		538			949			624			208	
Travel Time (s)		10.5			18.5			12.2			5.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.86	0.92	0.91	0.92	0.92	0.81	0.92	0.77	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	18%	4%	14%	3%	6%	11%	9%	10%	3%	10%	10%	10%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	62	464	42	173	608	116	44	30	178	126	35	65
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	506	0	173	608	116	44	208	0	126	100	0
Turn Type	Perm	NA		pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	2	2		1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	17.0	17.0		12.0	17.0	17.0	13.0	13.0		13.0	13.0	
Total Split (s)	58.0	58.0		18.0	76.0	76.0	40.0	40.0		40.0	40.0	
Total Split (%)	38.7%	38.7%		12.0%	50.7%	50.7%	26.7%	26.7%		26.7%	26.7%	
Maximum Green (s)	51.0	51.0		11.0	69.0	69.0	34.0	34.0		34.0	34.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	3.0	3.0		3.0	3.0	3.0	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	0.0	-2.0	-2.0		0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	7.0	4.0	4.0		6.0	6.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	

Lane Group ø9

Lane Configurations

Volume (vph)

Ideal Flow (vphpl)

Lane Width (ft)

Grade (%)

Storage Length (ft)

Storage Lanes

Taper Length (ft)

Lane Util. Factor

Ped Bike Factor

Frt

Flt Protected

Satd. Flow (prot)

Flt Permitted

Satd. Flow (perm)

Right Turn on Red

Satd. Flow (RTOR)

Link Speed (mph)

Link Distance (ft)

Travel Time (s)

Confl. Peds. (#/hr)

Confl. Bikes (#/hr)

Peak Hour Factor

Growth Factor

Heavy Vehicles (%)

Bus Blockages (#/hr)

Parking (#/hr)

Mid-Block Traffic (%)

Adj. Flow (vph)

Shared Lane Traffic (%)

Lane Group Flow (vph)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phase

Switch Phase

Minimum Initial (s) 1.0

Minimum Split (s) 34.0

Total Split (s) 34.0

Total Split (%) 23%

Maximum Green (s) 32.0

Yellow Time (s) 2.0

All-Red Time (s) 0.0

Lost Time Adjust (s)

Total Lost Time (s)

Lead/Lag

Lead-Lag Optimize?













Vehicle Extension (s) 3.0

Minimum Gap (s) 3.0

Lanes, Volumes, Timings
8: Dreher Ave/School Drive & Main Street

Stroudsburg Boro. P.M. Peak Hour With Peds

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	C-Max	C-Max		None	C-Max	C-Max	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)	56.7	56.7		75.0	75.0	73.0	32.0	32.0		30.0	30.0	
Actuated g/C Ratio	0.38	0.38		0.50	0.50	0.49	0.21	0.21		0.20	0.20	
v/c Ratio	0.36	0.77		0.66	0.75	0.16	0.20	0.45		0.98	0.29	
Control Delay	43.5	51.2		39.8	32.5	8.5	48.8	12.9		134.5	24.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	43.5	51.2		39.8	32.5	8.5	48.8	12.9		134.5	24.2	
LOS	D	D		D	C	A	D	B		F	C	
Approach Delay		50.3			30.8			19.1			85.7	
Approach LOS		D			C			B			F	
Queue Length 50th (ft)	45	449		85	340	13	34	23		120	33	
Queue Length 95th (ft)	95	565		166	438	49	64	97		#246	87	
Internal Link Dist (ft)		458			869			544			128	
Turn Bay Length (ft)	145			125		210	85			105		
Base Capacity (vph)	170	655		265	806	721	250	500		145	382	
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	
Reduced v/c Ratio	0.36	0.77		0.65	0.75	0.16	0.18	0.42		0.87	0.26	

Intersection Summary

Area Type: CBD

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 58 (39%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 41.4

Intersection LOS: D

Intersection Capacity Utilization 75.9%







ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 8: Dreher Ave/School Drive & Main Street

 p1	 p2 (R)	 p4	 p9
18 s	58 s	40 s	34 s
 p6 (R)		 p8	
76 s		40 s	



















Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	25.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings
9: 9th St & Main Street

Stroudsburg Boro. P.M. Peak Hour With Peds

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	177	362	7	2	306	161	43	74	63	301	8	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	12	11	11	12	11	11	11	10	10	10
Grade (%)		4%			1%			5%			-2%	
Storage Length (ft)	0		0	0		0	0		0	135		0
Storage Lanes	0		0	0		1	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.996				0.850		0.954			0.867	
Flt Protected		0.980			0.999			0.989		0.950		
Satd. Flow (prot)	0	2708	0	0	1596	1252	0	1494	0	1516	1378	0
Flt Permitted		0.596			0.993			0.919		0.504		
Satd. Flow (perm)	0	1647	0	0	1586	1252	0	1388	0	804	1378	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			35	
Link Distance (ft)		352			552			437			1438	
Travel Time (s)		7.9			5.2			11.9			4.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.57	0.85	0.35	0.50	0.81	0.77	0.77	0.64	0.72	0.91	1.00	0.55
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	9%	3%	0%	0%	3%	4%	2%	3%	0%	1%	13%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0			0						
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	311	426	20	4	378	209	56	116	88	331	8	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	757	0	0	382	209	0	260	0	331	72	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	9.5	14.5		14.5	14.5	14.5	13.0	13.0		13.0	13.0	
Total Split (s)	9.5	68.0		58.5	58.5	58.5	58.0	58.0		58.0	58.0	
Total Split (%)	6.3%	45.3%		39.0%	39.0%	39.0%	38.7%	38.7%		38.7%	38.7%	
Maximum Green (s)	5.0	63.5		54.0	54.0	54.0	52.0	52.0		52.0	52.0	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-0.5			-0.5	-0.5		-2.0		-2.0	-2.0	
Total Lost Time (s)		4.0			4.0	4.0		4.0		4.0	4.0	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	

Lane Group ø9

Lane Configurations

Volume (vph)

Ideal Flow (vphpl)

Lane Width (ft)

Grade (%)

Storage Length (ft)

Storage Lanes

Taper Length (ft)

Lane Util. Factor

Ped Bike Factor

Frt

Flt Protected

Satd. Flow (prot)

Flt Permitted

Satd. Flow (perm)

Right Turn on Red

Satd. Flow (RTOR)

Link Speed (mph)

Link Distance (ft)

Travel Time (s)

Confl. Peds. (#/hr)

Confl. Bikes (#/hr)

Peak Hour Factor

Growth Factor

Heavy Vehicles (%)

Bus Blockages (#/hr)

Parking (#/hr)

Mid-Block Traffic (%)

Adj. Flow (vph)

Shared Lane Traffic (%)

Lane Group Flow (vph)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phase

Switch Phase

Minimum Initial (s) 1.0

Minimum Split (s) 24.0

Total Split (s) 24.0

Total Split (%) 16%

Maximum Green (s) 22.0

Yellow Time (s) 2.0

All-Red Time (s) 0.0

Lost Time Adjust (s)

Total Lost Time (s)

Lead/Lag













Lead-Lag Optimize?

Vehicle Extension (s) 3.0

Minimum Gap (s) 3.0

Lanes, Volumes, Timings
9: 9th St & Main Street

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Recall Mode	None	C-Max		C-Max	C-Max	C-Max	None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		64.0			64.0	64.0		54.0		54.0	54.0	
Actuated g/C Ratio		0.43			0.43	0.43		0.36		0.36	0.36	
v/c Ratio		1.45dl			0.57	0.39		0.52		1.15	0.15	
Control Delay		83.6			31.5	28.3		42.4		141.1	33.5	
Queue Delay		0.0			1.0	0.0		0.0		0.0	0.0	
Total Delay		83.6			32.4	28.3		42.4		141.1	33.5	
LOS		F			C	C		D		F	C	
Approach Delay		83.6			31.0			42.4			121.8	
Approach LOS		F			C			D			F	
Queue Length 50th (ft)		~423			238	128		200		~378	48	
Queue Length 95th (ft)		#506			277	156		191		#579	87	
Internal Link Dist (ft)		272			472			357			1358	
Turn Bay Length (ft)										135		
Base Capacity (vph)		702			676	534		499		289	496	
Starvation Cap Reductn		0			112	0		0		0	0	
Spillback Cap Reductn		0			0	0		0		0	0	
Storage Cap Reductn		0			0	0		0		0	0	
Reduced v/c Ratio		1.08			0.68	0.39		0.52		1.15	0.15	

Intersection Summary

Area Type: CBD

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 62 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 150

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.15

Intersection Signal Delay: 70.5

Intersection LOS: E

Intersection Capacity Utilization 78.2%

ICU Level of Service D

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.







Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 9: 9th St & Main Street

 p2 (R)		 p4	 p9
68 s		58 s	24 s
 p5	 p6 (R)	 p8	
9.5 s	58.5 s	58 s	

















Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	8.0
Flash Dont Walk (s)	14.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings
10: 8th St & Main Street/Main Street

Stroudsburg Boro. P.M. Peak Hour With Peds

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	518	22	6	252	8	65	76	35	43	19	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	13	13	13	10	10	10	10	10	10
Grade (%)		0%			0%			1%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.993			0.995			0.968			0.931	
Flt Protected		0.995			0.998			0.984			0.984	
Satd. Flow (prot)	0	*3502	0	0	*1772	0	0	*1760	0	0	*1624	0
Flt Permitted		0.899			0.973			0.835			0.818	
Satd. Flow (perm)	0	*3021	0	0	*1733	0	0	*1405	0	0	*1397	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		552			555			340			310	
Travel Time (s)		8.5			8.2			9.3			8.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.73	0.93	0.69	0.50	0.86	0.67	0.90	0.79	0.67	0.77	0.68	0.77
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	2%	5%	0%	1%	0%	3%	0%	3%	2%	0%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0	0	0	0	0	0	0			
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	60	557	32	12	293	12	72	96	52	56	28	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	649	0	0	317	0	0	220	0	0	172	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	14.5	14.5		14.5	14.5		12.5	12.5		12.5	12.5	
Total Split (s)	27.5	27.5		27.5	27.5		25.5	25.5		25.5	25.5	
Total Split (%)	36.7%	36.7%		36.7%	36.7%		34.0%	34.0%		34.0%	34.0%	
Maximum Green (s)	23.0	23.0		23.0	23.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	1.5	1.5		1.5	1.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)		-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)		2.5			2.5			3.5			3.5	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	

Lane Group ø9

Lane Configurations

Volume (vph)

Ideal Flow (vphpl)

Lane Width (ft)

Grade (%)

Storage Length (ft)

Storage Lanes

Taper Length (ft)

Lane Util. Factor

Ped Bike Factor

Frt

Flt Protected

Satd. Flow (prot)

Flt Permitted

Satd. Flow (perm)

Right Turn on Red

Satd. Flow (RTOR)

Link Speed (mph)

Link Distance (ft)

Travel Time (s)

Confl. Peds. (#/hr)

Confl. Bikes (#/hr)

Peak Hour Factor

Growth Factor

Heavy Vehicles (%)

Bus Blockages (#/hr)

Parking (#/hr)

Mid-Block Traffic (%)

Adj. Flow (vph)

Shared Lane Traffic (%)

Lane Group Flow (vph)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phase

Switch Phase

Minimum Initial (s) 1.0

Minimum Split (s) 22.0

Total Split (s) 22.0

Total Split (%) 29%

Maximum Green (s) 20.0

Yellow Time (s) 2.0

All-Red Time (s) 0.0

Lost Time Adjust (s)

Total Lost Time (s)

Lead/Lag

Lead-Lag Optimize?













Vehicle Extension (s) 3.0

Minimum Gap (s) 3.0

Lanes, Volumes, Timings
10: 8th St & Main Street/Main Street

Stroudsburg Boro. P.M. Peak Hour With Peds

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		30.9			30.9			18.1			18.1	
Actuated g/C Ratio		0.41			0.41			0.24			0.24	
v/c Ratio		0.52			0.44			0.65			0.51	
Control Delay		14.2			13.2			34.4			29.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		14.2			13.2			34.4			29.4	
LOS		B			B			C			C	
Approach Delay		14.2			13.2			34.4			29.4	
Approach LOS		B			B			C			C	
Queue Length 50th (ft)		164			79			91			68	
Queue Length 95th (ft)		m155			167			128			84	
Internal Link Dist (ft)		472			475			260			230	
Turn Bay Length (ft)												
Base Capacity (vph)		1245			714			412			409	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.52			0.44			0.53			0.42	

Intersection Summary

Area Type: CBD

Cycle Length: 75

Actuated Cycle Length: 75

Offset: 44 (59%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 19.2

Intersection LOS: B

Intersection Capacity Utilization 58.6%






ICU Level of Service B

Analysis Period (min) 15

* User Entered Value

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: 8th St & Main Street/Main Street

 p2 (R)	 p4	 p9
27.5 s	25.5 s	22 s
 p6 (R)	 p8	
27.5 s	25.5 s	

Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	11.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

















HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings

Stroudsburg Boro. P.M. Peak Hour With Peds

11: Seventh St/7th St & Main Street /Main Street

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	390	139	18	250	22	54	69	57	31	124	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	13	13	13	14	14	14	11	11	11
Grade (%)		-1%			2%			4%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.963			0.984			0.963			0.975	
Flt Protected		0.998			0.997			0.983			0.988	
Satd. Flow (prot)	0	2815	0	0	1532	0	0	1633	0	0	1432	0
Flt Permitted		0.922			0.938			0.680			0.801	
Satd. Flow (perm)	0	2600	0	0	1441	0	0	1130	0	0	1161	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		555			308			456			331	
Travel Time (s)		15.1			8.4			12.4			9.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.82	0.79	0.81	0.75	0.74	0.46	0.59	0.72	0.79	0.48	0.86	0.58
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	3%	1%	0%	1%	0%	4%	3%	4%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0	0	0	0				0	0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	28	494	172	24	338	48	92	96	72	65	144	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	694	0	0	410	0	0	260	0	0	257	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Detector Phase	2	2		6	6		8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0		7.0	7.0	
Minimum Split (s)	15.0	15.0		15.0	15.0		12.0	12.0		12.0	12.0	
Total Split (s)	72.0	72.0		72.0	72.0		56.0	56.0		56.0	56.0	
Total Split (%)	48.0%	48.0%		48.0%	48.0%		37.3%	37.3%		37.3%	37.3%	
Maximum Green (s)	67.0	67.0		67.0	67.0		51.0	51.0		51.0	51.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)		3.0			3.0			3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	

Lane Group ø9

Lane Configurations

Volume (vph)

Ideal Flow (vphpl)

Lane Width (ft)

Grade (%)

Storage Length (ft)

Storage Lanes

Taper Length (ft)

Lane Util. Factor

Ped Bike Factor

Frt

Flt Protected

Satd. Flow (prot)

Flt Permitted

Satd. Flow (perm)

Right Turn on Red

Satd. Flow (RTOR)

Link Speed (mph)

Link Distance (ft)

Travel Time (s)

Confl. Peds. (#/hr)

Confl. Bikes (#/hr)

Peak Hour Factor

Growth Factor

Heavy Vehicles (%)

Bus Blockages (#/hr)

Parking (#/hr)

Mid-Block Traffic (%)

Adj. Flow (vph)

Shared Lane Traffic (%)

Lane Group Flow (vph)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phase

Switch Phase

Minimum Initial (s) 1.0

Minimum Split (s) 22.0

Total Split (s) 22.0

Total Split (%) 15%

Maximum Green (s) 20.0

Yellow Time (s) 2.0

All-Red Time (s) 0.0

Lost Time Adjust (s)

Total Lost Time (s)

Lead/Lag

Lead-Lag Optimize?

Vehicle Extension (s) 3.0













Minimum Gap (s) 3.0

Lanes, Volumes, Timings

Stroudsburg Boro. P.M. Peak Hour With Peds

11: Seventh St/7th St & Main Street /Main Street

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		82.7			82.7			39.3			39.3	
Actuated g/C Ratio		0.55			0.55			0.26			0.26	
v/c Ratio		0.48			0.52			0.88			0.85	
Control Delay		14.4			17.2			62.2			75.4	
Queue Delay		0.0			0.8			0.1			0.0	
Total Delay		14.4			18.1			62.3			75.4	
LOS		B			B			E			E	
Approach Delay		14.4			18.1			62.3			75.4	
Approach LOS		B			B			E			E	
Queue Length 50th (ft)		152			151			248			239	
Queue Length 95th (ft)		166			160			224			300	
Internal Link Dist (ft)		475			228			376			251	
Turn Bay Length (ft)												
Base Capacity (vph)		1432			794			399			410	
Starvation Cap Reductn		0			159			4			0	
Spillback Cap Reductn		7			8			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.49			0.65			0.66			0.63	

Intersection Summary

Area Type: CBD

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow, Master Intersection

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 32.7






Intersection LOS: C

Intersection Capacity Utilization 58.5%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 11: Seventh St/7th St & Main Street /Main Street

 ø2 (R)		 ø9
72 s	56 s	22 s
 ø6 (R)		
72 s	56 s	

Lane Group	ø9
------------	----

Time Before Reduce (s)	0.0
------------------------	-----

Time To Reduce (s)	0.0
--------------------	-----

Recall Mode	Ped
-------------	-----

Walk Time (s)	9.0
---------------	-----

Flash Dont Walk (s)	11.0
---------------------	------

Pedestrian Calls (#/hr)	15
-------------------------	----

Act Effct Green (s)	
---------------------	--

Actuated g/C Ratio	
--------------------	--

v/c Ratio	
-----------	--

Control Delay	
---------------	--

Queue Delay	
-------------	--

Total Delay	
-------------	--

LOS	
-----	--

Approach Delay	
----------------	--

Approach LOS	
--------------	--

Queue Length 50th (ft)	
------------------------	--

Queue Length 95th (ft)	
------------------------	--

Internal Link Dist (ft)	
-------------------------	--

Turn Bay Length (ft)	
----------------------	--

Base Capacity (vph)	
---------------------	--

Starvation Cap Reductn	
------------------------	--

Spillback Cap Reductn	
-----------------------	--

Storage Cap Reductn	
---------------------	--

Reduced v/c Ratio	
-------------------	--
















Intersection Summary	
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HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings
12: Seventh St & Ann St

Stroudsburg Boro. P.M. Peak Hour With Peds













Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	44	131	33	148	163	0	0	387	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	16	16	16	16	16	16	10	10	10
Grade (%)		0%			2%			-5%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.978						0.977	
Flt Protected					0.986			0.977				
Satd. Flow (prot)	0	0	0	0	1830	0	0	2124	0	0	1546	0
Flt Permitted					0.986			0.429				
Satd. Flow (perm)	0	0	0	0	1830	0	0	933	0	0	1546	0
Right Turn on Red			No			Yes			No			Yes
Satd. Flow (RTOR)					7						12	
Link Speed (mph)		25			25			35			25	
Link Distance (ft)		273			284			513			456	
Travel Time (s)		7.4			7.7			10.0			12.4	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.52	0.82	0.69	0.82	0.80	0.92	0.92	0.91	0.73
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	2%	1%	0%	1%	2%	0%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)				0	0	0					0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	0	0	85	160	48	180	204	0	0	425	88
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	293	0	0	384	0	0	513	0
Turn Type				Perm	NA		pm+pt	NA			NA	
Protected Phases					6		3	8			4	
Permitted Phases				6			8					
Detector Phase				6	6		3	8				
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	7.0			7.0	
Minimum Split (s)				23.0	23.0		10.5	20.5			20.5	
Total Split (s)				49.0	49.0		10.5	101.0			90.5	
Total Split (%)				32.7%	32.7%		7.0%	67.3%			60.3%	
Maximum Green (s)				44.0	44.0		5.0	95.5			85.0	
Yellow Time (s)				3.5	3.5		4.0	4.0			4.0	
All-Red Time (s)				1.5	1.5		1.5	1.5			1.5	
Lost Time Adjust (s)					-1.0			-1.0			-1.0	
Total Lost Time (s)					4.0			4.5			4.5	
Lead/Lag							Lead				Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Minimum Gap (s)				3.0	3.0		3.0	3.0			3.0	

Lanes, Volumes, Timings
12: Seventh St & Ann St

Stroudsburg Boro. P.M. Peak Hour With Peds

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)				0.0	0.0		0.0	0.0			0.0	
Time To Reduce (s)				0.0	0.0		0.0	0.0			0.0	
Recall Mode				C-Max	C-Max		None	None			None	
Walk Time (s)				7.0	7.0			7.0			7.0	
Flash Dont Walk (s)				11.0	11.0			8.0			8.0	
Pedestrian Calls (#/hr)				14	14			2			2	
Act Effect Green (s)					62.7			78.8			78.8	
Actuated g/C Ratio					0.42			0.53			0.53	
v/c Ratio					0.38			0.78			0.63	
Control Delay					35.6			38.9			23.1	
Queue Delay					0.0			0.0			1.6	
Total Delay					35.6			38.9			24.7	
LOS					D			D			C	
Approach Delay					35.6			38.9			24.7	
Approach LOS					D			D			C	
Queue Length 50th (ft)					193			294			291	
Queue Length 95th (ft)					294			268			325	
Internal Link Dist (ft)		193			204			433			376	
Turn Bay Length (ft)												
Base Capacity (vph)					768			600			934	
Starvation Cap Reductn					0			0			248	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.38			0.64			0.75	

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 115 (77%), Referenced to phase 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 32.0

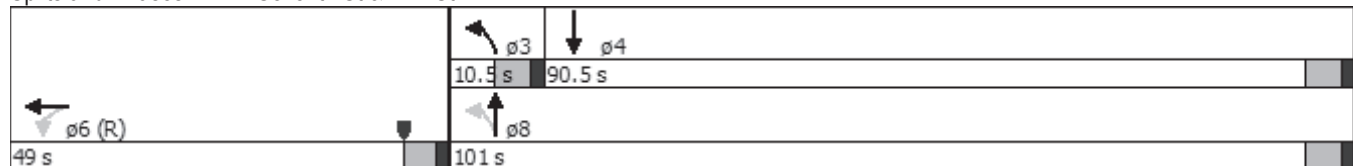
Intersection Capacity Utilization 63.2%

Analysis Period (min) 15

Intersection LOS: C

ICU Level of Service B

Splits and Phases: 12: Seventh St & Ann St


















HCM 2010 Signalized Intersection Summary

12: Seventh St & Ann St

Stroudsburg Boro. P.M. Peak Hour With Peds
















Existing Year 2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	44	131	33	148	163	0	0	387	64
Number				1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj				1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00	0.90
Adj Sat Flow veh/h/ln				195.6	193.4	195.6	202.5	199.5	0.0	0.0	188.4	190.0
Lanes				0	1	0	0	1	0	0	1	0
Cap, veh/h				229	431	129	246	264	0	0	596	123
Arrive On Green				0.47	0.47	0.46	0.44	0.44	0.00	0.00	0.87	0.85
Sat Flow, veh/h				484	911	273	437	604	0	0	1364	282
Grp Volume(v), veh/h				293	0	0	384	0	0	0	0	513
Grp Sat Flow(s),veh/h/ln				1669	0	0	1040	0	0	0	0	1646
Q Serve(g_s), s				10.7	0.0	0.0	0.1	0.0	0.0	0.0	0.0	10.1
Cycle Q Clear(g_c), s				10.7	0.0	0.0	34.3	0.0	0.0	0.0	0.0	10.1
Prop In Lane				0.29		0.16	0.47		0.00	0.00		0.17
Lane Grp Cap(c), veh/h				790	0	0	510	0	0	0	0	719
V/C Ratio(X)				0.37	0.00	0.00	0.75	0.00	0.00	0.00	0.00	0.71
Avail Cap(c_a), veh/h				790	0	0	1270	0	0	0	0	1490
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.42
Uniform Delay (d), s/veh				16.0	0.0	0.0	27.5	0.0	0.0	0.0	0.0	4.1
Incr Delay (d2), s/veh				1.3	0.0	0.0	2.3	0.0	0.0	0.0	0.0	0.6
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q (50%), veh/ln				4.6	0.0	0.0	8.2	0.0	0.0	0.0	0.0	1.8
Lane Grp Delay (d), s/veh				17.4	0.0	0.0	29.8	0.0	0.0	0.0	0.0	4.7
Lane Grp LOS				B			C					A
Approach Vol, veh/h					293			384			513	
Approach Delay, s/veh					17.4			29.8			4.7	
Approach LOS					B			C			A	
Timer												
Assigned Phs					6		3	8			4	
Phs Duration (G+Y+Rc), s					49.0		0.0	46.2			46.2	
Change Period (Y+Rc), s					5.0		5.5	5.5			5.5	
Max Green Setting (Gmax), s					44.0		5.0	95.5			85.0	
Max Q Clear Time (g_c+I1), s					12.7		0.0	36.3			12.1	
Green Ext Time (p_c), s					0.7		0.0	4.6			4.7	
Intersection Summary												
HCM 2010 Ctrl Delay				15.9								
HCM 2010 LOS				B								
Notes												

Lanes, Volumes, Timings
13: 6th St & Main Street

Stroudsburg Boro. P.M. Peak Hour With Peds

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	27	527	19	15	245	34	44	65	61	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	16	16	16	11	11	11	12	12	12
Grade (%)		-1%			2%			-1%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.994			0.982			0.955				
Flt Protected		0.997			0.997			0.988				
Satd. Flow (prot)	0	2945	0	0	1677	0	0	1554	0	0	0	0
Flt Permitted		0.897			0.935			0.988				
Satd. Flow (perm)	0	2650	0	0	1573	0	0	1554	0	0	0	0
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)		4			7							
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		308			744			383			229	
Travel Time (s)		6.0			14.5			7.5			4.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.61	0.90	0.68	0.63	0.83	0.71	0.79	0.68	0.80	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	2%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)		0	0	0	0	0						
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	44	586	28	24	295	48	56	96	76	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	658	0	0	367	0	0	228	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA				
Protected Phases		2			6			4				
Permitted Phases	2			6			4					
Detector Phase	2	2		6	6		4	4				
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		7.0	7.0				
Minimum Split (s)	15.0	15.0		15.0	15.0		12.0	12.0				
Total Split (s)	78.0	78.0		78.0	78.0		53.0	53.0				
Total Split (%)	52.0%	52.0%		52.0%	52.0%		35.3%	35.3%				
Maximum Green (s)	73.0	73.0		73.0	73.0		48.0	48.0				
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5				
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5				
Lost Time Adjust (s)		-1.0			-1.0			-1.0				
Total Lost Time (s)		4.0			4.0			4.0				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0				
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0				

Lane Group ø9

Lane Configurations

Volume (vph)

Ideal Flow (vphpl)

Lane Width (ft)

Grade (%)

Storage Length (ft)

Storage Lanes

Taper Length (ft)

Lane Util. Factor

Ped Bike Factor

Frt

Flt Protected

Satd. Flow (prot)

Flt Permitted

Satd. Flow (perm)

Right Turn on Red

Satd. Flow (RTOR)

Link Speed (mph)

Link Distance (ft)

Travel Time (s)

Confl. Peds. (#/hr)

Confl. Bikes (#/hr)

Peak Hour Factor

Growth Factor

Heavy Vehicles (%)

Bus Blockages (#/hr)

Parking (#/hr)

Mid-Block Traffic (%)

Adj. Flow (vph)

Shared Lane Traffic (%)

Lane Group Flow (vph)

Turn Type

Protected Phases 9

Permitted Phases

Detector Phase

Switch Phase

Minimum Initial (s) 1.0

Minimum Split (s) 19.0

Total Split (s) 19.0

Total Split (%) 13%

Maximum Green (s) 17.0

Yellow Time (s) 2.0

All-Red Time (s) 0.0

Lost Time Adjust (s)

Total Lost Time (s)

Lead/Lag













Lead-Lag Optimize?

Vehicle Extension (s) 3.0

Minimum Gap (s) 3.0

Lanes, Volumes, Timings
13: 6th St & Main Street

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0				
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None				
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		94.4			94.4			28.6				
Actuated g/C Ratio		0.63			0.63			0.19				
v/c Ratio		0.39			0.37			0.77				
Control Delay		9.2			15.9			74.2				
Queue Delay		0.5			0.0			0.0				
Total Delay		9.6			15.9			74.2				
LOS		A			B			E				
Approach Delay		9.6			15.9			74.2				
Approach LOS		A			B			E				
Queue Length 50th (ft)		150			179			214				
Queue Length 95th (ft)		200			259			207				
Internal Link Dist (ft)		228			664			303			149	
Turn Bay Length (ft)												
Base Capacity (vph)		1669			992			507				
Starvation Cap Reductn		542			0			0				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.58			0.37			0.45				

Intersection Summary

Area Type: CBD

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 28 (19%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 23.2





Intersection Capacity Utilization 47.8%

Analysis Period (min) 15

Intersection LOS: C

ICU Level of Service A

Splits and Phases: 13: 6th St & Main Street

 p2 (R)		 p4	 p9
78 s		53 s	19 s
 p6 (R)			
78 s			

Lane Group	ø9
Time Before Reduce (s)	0.0
Time To Reduce (s)	0.0
Recall Mode	Ped
Walk Time (s)	7.0
Flash Dont Walk (s)	10.0
Pedestrian Calls (#/hr)	15
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

HCM 2010 methodology does not support exclusive ped or hold phases.

Lanes, Volumes, Timings
14: Ann St & Broad St/5th St & Main Street

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

	→	↘	↙	↗	↘	↓	↗	
Lane Group	EBT	EBR	NBL2	NBR	SBL	SBT	SBR2	ø9
Lane Configurations	↑↑		↘	↗	↘	↑	↗	
Volume (vph)	513	58	203	459	78	447	348	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	11	10	11	10	10	11	
Grade (%)	-5%					2%		
Storage Length (ft)		0		0	0			
Storage Lanes		0		1	1			
Taper Length (ft)					25			
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	
Ped Bike Factor								
Frt	0.985			0.850			0.850	
Flt Protected			0.950		0.950			
Satd. Flow (prot)	*3372	0	1509	1398	*1752	*1793	1377	
Flt Permitted			0.243		0.950			
Satd. Flow (perm)	*3372	0	386	1398	*1752	*1792	1377	
Right Turn on Red				No	No		Yes	
Satd. Flow (RTOR)							382	
Link Speed (mph)	25					25		
Link Distance (ft)	744					298		
Travel Time (s)	20.3					8.2		
Confl. Peds. (#/hr)								
Confl. Bikes (#/hr)								
Peak Hour Factor	0.92	0.91	0.91	0.96	0.81	0.95	0.91	
Growth Factor	100%	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	0%	0%	1%	1%	3%	2%	1%	
Bus Blockages (#/hr)	0	0	0	0	0	0	0	
Parking (#/hr)								
Mid-Block Traffic (%)	0%					0%		
Adj. Flow (vph)	558	64	223	478	96	471	382	
Shared Lane Traffic (%)								
Lane Group Flow (vph)	622	0	223	478	96	471	382	
Turn Type	NA		custom	custom	pm+pt	NA	custom	
Protected Phases	8		1	6	5	2		9
Permitted Phases			6		2		2 8	
Detector Phase	8		1	6	5	2	2 8	
Switch Phase								
Minimum Initial (s)	7.0		5.0	10.0	5.0	10.0		1.0
Minimum Split (s)	14.0		12.5	16.5	11.5	16.5		22.0
Total Split (s)	40.0		27.5	76.5	11.5	60.5		22.0
Total Split (%)	26.7%		18.3%	51.0%	7.7%	40.3%		15%
Maximum Green (s)	33.0		21.0	70.0	5.0	54.0		20.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0		2.0
All-Red Time (s)	3.0		2.5	2.5	2.5	2.5		0.0
Lost Time Adjust (s)	-2.5		0.0	-2.5	-2.5	-2.5		
Total Lost Time (s)	4.5		6.5	4.0	4.0	4.0		
Lead/Lag			Lead	Lag	Lead	Lag		
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0		3.0
Minimum Gap (s)	3.0		3.0	3.0	3.0	3.0		3.0

Lanes, Volumes, Timings
14: Ann St & Broad St/5th St & Main Street

Stroudsburg Boro. P.M. Peak Hour With Peds

Existing Year 2013

	→	↘	↙	↗	↘	↓	↙	
Lane Group	EBT	EBR	NBL2	NBR	SBL	SBT	SBR2	ø9
Time Before Reduce (s)	0.0		0.0	0.0	0.0	0.0		0.0
Time To Reduce (s)	0.0		0.0	0.0	0.0	0.0		0.0
Recall Mode	None		None	None	None	C-Max		Ped
Walk Time (s)								7.0
Flash Dont Walk (s)								13.0
Pedestrian Calls (#/hr)								15
Act Effct Green (s)	33.9		82.7	73.4	70.3	62.2	98.2	
Actuated g/C Ratio	0.23		0.55	0.49	0.47	0.41	0.65	
v/c Ratio	0.82		0.66	0.70	0.12	0.63	0.37	
Control Delay	45.2		27.9	36.8	15.0	37.1	1.8	
Queue Delay	0.0		0.0	0.0	0.0	1.1	0.0	
Total Delay	45.2		27.9	36.8	15.0	38.2	1.8	
LOS	D		C	D	B	D	A	
Approach Delay	45.2					21.2		
Approach LOS	D					C		
Queue Length 50th (ft)	235		114	361	36	354	10	
Queue Length 95th (ft)	330		169	506	m47	m450	m22	
Internal Link Dist (ft)	664					218		
Turn Bay Length (ft)			190					
Base Capacity (vph)	798		370	684	821	743	1043	
Starvation Cap Reductn	0		0	0	0	106	0	
Spillback Cap Reductn	0		0	0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	0	
Reduced v/c Ratio	0.78		0.60	0.70	0.12	0.74	0.37	

Intersection Summary

Area Type: CBD

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 112 (75%), Referenced to phase 2:SBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 31.7

Intersection LOS: C

Intersection Capacity Utilization 66.9%







ICU Level of Service C

Analysis Period (min) 15

* User Entered Value

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: Ann St & Broad St/5th St & Main Street


















 ø1	 ø2 (R)	 ø9
27.5 s	60.5 s	22 s
 ø5	 ø6	 ø8
11.5 s	76.5 s	40 s

HCM 2010 methodology does not support more than 4 approaches.

Lanes, Volumes, Timings
20: McConnell St & 4th St

Stroudsburg Boro. P.M. Peak Hour With Peds













Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											  	
Volume (vph)	0	90	19	122	1	0	0	0	0	142	765	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	15	15	15	14	14	14	12	12	12	14	14	14
Grade (%)		1%			-1%			0%			1%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor												
Frt		0.977										
Flt Protected					0.953						0.992	
Satd. Flow (prot)	0	*862	0	*619	1730	0	0	0	0	0	*1459	0
Flt Permitted					0.481						0.992	
Satd. Flow (perm)	0	*862	0	*606	873	0	0	0	0	0	*1459	0
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)		6										
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		163			256			357			512	
Travel Time (s)		4.4			7.0			7.6			14.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.75	0.79	0.78	0.92	0.92	0.92	0.92	0.92	0.85	0.89	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	120	24	156	1	0	0	0	0	167	860	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	144	0	0	157	0	0	0	0	0	1027	0
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		7.0		7.0	7.0					10.0	10.0	
Minimum Split (s)		22.0		22.0	22.0					21.0	21.0	
Total Split (s)		34.0		34.0	34.0					116.0	116.0	
Total Split (%)		22.7%		22.7%	22.7%					77.3%	77.3%	
Maximum Green (s)		29.0		29.0	29.0					111.0	111.0	
Yellow Time (s)		3.5		3.5	3.5					3.5	3.5	
All-Red Time (s)		1.5		1.5	1.5					1.5	1.5	
Lost Time Adjust (s)		-1.0			0.0						-1.0	
Total Lost Time (s)		4.0			5.0						4.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	
Minimum Gap (s)		3.0		3.0	3.0					3.0	3.0	

Lanes, Volumes, Timings
20: McConnell St & 4th St

Stroudsburg Boro. P.M. Peak Hour With Peds

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)		0.0		0.0	0.0					0.0	0.0	
Time To Reduce (s)		0.0		0.0	0.0					0.0	0.0	
Recall Mode		None		None	None					C-Max	C-Max	
Walk Time (s)		7.0		7.0	7.0					7.0	7.0	
Flash Dont Walk (s)		10.0		10.0	10.0					9.0	9.0	
Pedestrian Calls (#/hr)		3		3	3					21	21	
Act Effct Green (s)		29.1			28.1						112.9	
Actuated g/C Ratio		0.19			0.19						0.75	
v/c Ratio		0.84			0.96						0.94	
Control Delay		91.8			120.7						27.0	
Queue Delay		0.0			0.0						0.1	
Total Delay		91.8			120.7						27.1	
LOS		F			F						C	
Approach Delay		91.8			120.7						27.1	
Approach LOS		F			F						C	
Queue Length 50th (ft)		131			153						305	
Queue Length 95th (ft)		#183			#299						#634	
Internal Link Dist (ft)		83			176			277			432	
Turn Bay Length (ft)												
Base Capacity (vph)		177			168						1098	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						2	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.81			0.93						0.94	

Intersection Summary

Area Type: CBD

Cycle Length: 150

Actuated Cycle Length: 150

Offset: 112 (75%), Referenced to phase 6:SBTL, Start of Yellow

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 45.2

Intersection LOS: D

Intersection Capacity Utilization 49.8%

ICU Level of Service A

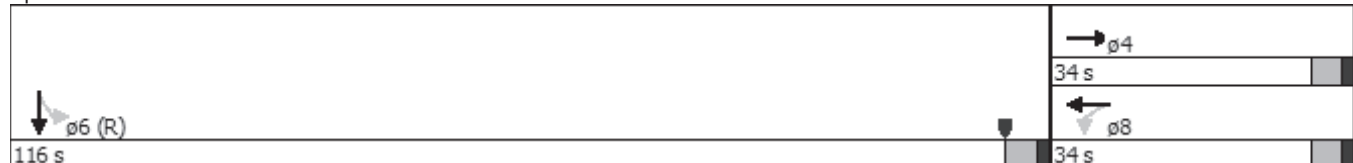
Analysis Period (min) 15

* User Entered Value

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 20: McConnell St & 4th St



















HCM 2010 Signalized Intersection Summary

20: McConnell St & 4th St

Stroudsburg Boro. P.M. Peak Hour With Peds


















Existing Year 2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											 	
Volume (veh/h)	0	90	19	122	1	0	0	0	0	142	765	0
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	177.0	177.0	178.7	177.0	0.0				177.0	175.2	0.0
Lanes	0	1	0	0	1	0				0	2	0
Cap, veh/h	0	286	57	192	1	0				403	2193	0
Arrive On Green	0.00	0.20	0.19	0.20	0.19	0.00				0.75	0.75	0.00
Sat Flow, veh/h	0	1432	286	743	5	0				540	2937	0
Grp Volume(v), veh/h	0	0	144	157	0	0				534	493	0
Grp Sat Flow(s),veh/h/ln	0	0	1719	748	0	0				1725	1752	0
Q Serve(g_s), s	0.0	0.0	11.0	19.0	0.0	0.0				17.0	14.9	0.0
Cycle Q Clear(g_c), s	0.0	0.0	11.0	30.0	0.0	0.0				17.0	14.9	0.0
Prop In Lane	0.00		0.17	0.99		0.00				0.31		0.00
Lane Grp Cap(c), veh/h	0	0	344	197	0	0				1288	1308	0
V/C Ratio(X)	0.00	0.00	0.42	0.80	0.00	0.00				0.41	0.38	0.00
Avail Cap(c_a), veh/h	0	0	344	197	0	0				1288	1308	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00				1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	52.5	66.3	0.0	0.0				7.0	6.7	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.8	19.8	0.0	0.0				1.0	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.0	0.0	5.0	7.2	0.0	0.0				6.9	6.2	0.0
Lane Grp Delay (d), s/veh	0.0	0.0	53.3	86.1	0.0	0.0				8.0	7.5	0.0
Lane Grp LOS			D	F						A	A	
Approach Vol, veh/h		144			157						1027	
Approach Delay, s/veh		53.3			86.1						7.8	
Approach LOS		D			F						A	
Timer												
Assigned Phs		4			8						6	
Phs Duration (G+Y+Rc), s		34.0			34.0						116.0	
Change Period (Y+Rc), s		5.0			5.0						5.0	
Max Green Setting (Gmax), s		29.0			29.0						111.0	
Max Q Clear Time (g_c+I1), s		13.0			32.0						0.0	
Green Ext Time (p_c), s		1.0			0.0						0.0	
Intersection Summary												
HCM 2010 Ctrl Delay			22.0									
HCM 2010 LOS			C									
Notes												

Lanes, Volumes, Timings
21: McConnell St & 3rd St

Stroudsburg Boro. P.M. Peak Hour With Peds













Existing Year 2013

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											 	
Volume (vph)	0	105	72	16	126	0	0	0	0	9	941	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	12	12	12	12	12	12	13	11	14
Grade (%)		1%			-2%			0%			-1%	
Storage Length (ft)	0		0	0		0	0		0	0		175
Storage Lanes	0		0	0		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor												
Frt		0.949										0.850
Flt Protected					0.991						0.999	
Satd. Flow (prot)	0	*1762	0	0	*1857	0	0	0	0	0	*1931	1558
Flt Permitted					0.874						0.999	
Satd. Flow (perm)	0	*1762	0	0	*1857	0	0	0	0	0	*1931	1558
Right Turn on Red			Yes			No			No			Yes
Satd. Flow (RTOR)		43										155
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		348			248			268			452	
Travel Time (s)		9.5			6.8			7.3			7.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.80	0.90	0.57	0.96	0.92	0.92	0.92	0.92	0.56	0.97	0.74
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	131	80	28	131	0	0	0	0	16	970	155
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	211	0	0	159	0	0	0	0	0	986	155
Turn Type		NA		Perm	NA					Perm	NA	Perm
Protected Phases		4			8						6	
Permitted Phases				8						6		6
Detector Phase		4		8	8					6	6	6
Switch Phase												
Minimum Initial (s)		7.0		7.0	7.0					10.0	10.0	10.0
Minimum Split (s)		28.0		28.0	28.0					21.0	21.0	21.0
Total Split (s)		28.0		28.0	28.0					47.0	47.0	47.0
Total Split (%)		37.3%		37.3%	37.3%					62.7%	62.7%	62.7%
Maximum Green (s)		23.0		23.0	23.0					42.0	42.0	42.0
Yellow Time (s)		3.0		3.0	3.0					3.5	3.5	3.5
All-Red Time (s)		2.0		2.0	2.0					1.5	1.5	1.5
Lost Time Adjust (s)		-1.0			-1.0						-1.0	-1.0
Total Lost Time (s)		4.0			4.0						4.0	4.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	3.0
Minimum Gap (s)		3.0		3.0	3.0					3.0	3.0	3.0

Lanes, Volumes, Timings
21: McConnell St & 3rd St

Stroudsburg Boro. P.M. Peak Hour With Peds

Existing Year 2013

												
Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Time Before Reduce (s)		0.0		0.0	0.0					0.0	0.0	0.0
Time To Reduce (s)		0.0		0.0	0.0					0.0	0.0	0.0
Recall Mode		None		None	None					C-Max	C-Max	C-Max
Walk Time (s)		9.0		9.0	9.0					7.0	7.0	7.0
Flash Dont Walk (s)		14.0		14.0	14.0					9.0	9.0	9.0
Pedestrian Calls (#/hr)		6		6	6					3	3	3
Act Effct Green (s)		14.6			14.6						52.4	52.4
Actuated g/C Ratio		0.19			0.19						0.70	0.70
v/c Ratio		0.56			0.44						0.73	0.14
Control Delay		26.1			28.9						13.5	1.5
Queue Delay		0.0			0.0						0.0	0.0
Total Delay		26.1			28.9						13.5	1.5
LOS		C			C						B	A
Approach Delay		26.1			28.9						11.9	
Approach LOS		C			C						B	
Queue Length 50th (ft)		72			67						115	0
Queue Length 95th (ft)		96			100						#341	12
Internal Link Dist (ft)		268			168			188			372	
Turn Bay Length (ft)												175
Base Capacity (vph)		593			594						1348	1134
Starvation Cap Reductn		0			0						0	0
Spillback Cap Reductn		0			0						0	0
Storage Cap Reductn		0			0						0	0
Reduced v/c Ratio		0.36			0.27						0.73	0.14

Intersection Summary

Area Type: CBD

Cycle Length: 75

Actuated Cycle Length: 75

Offset: 19 (25%), Referenced to phase 6:SWTL, Start of Yellow

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 15.6

Intersection LOS: B

Intersection Capacity Utilization 58.1%

ICU Level of Service B

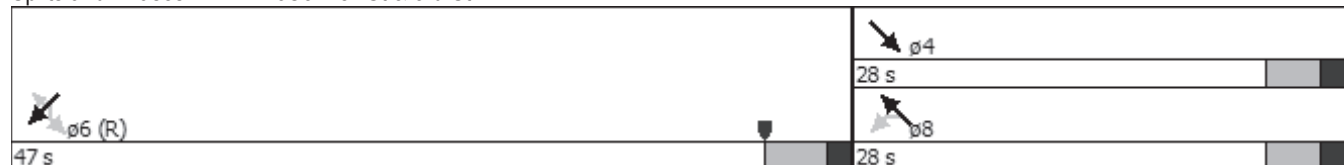
Analysis Period (min) 15

* User Entered Value

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.


















Splits and Phases: 21: McConnell St & 3rd St



HCM 2010 Signalized Intersection Summary

21: McConnell St & 3rd St


















Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations											 	
Volume (veh/h)	0	105	72	16	126	0	0	0	0	9	941	115
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow veh/h/ln	0.0	169.5	170.1	172.7	172.7	0.0				178.7	170.2	178.7
Lanes	0	1	0	0	1	0				0	2	1
Cap, veh/h	0	197	120	88	228	0				36	2259	1025
Arrive On Green	0.00	0.20	0.18	0.20	0.20	0.00				0.67	0.67	0.67
Sat Flow, veh/h	0	986	602	106	1140	0				53	3348	1519
Grp Volume(v), veh/h	0	0	211	159	0	0				516	470	155
Grp Sat Flow(s),veh/h/ln	0	0	1589	1246	0	0				1699	1702	1519
Q Serve(g_s), s	0.0	0.0	7.8	0.8	0.0	0.0				9.0	7.9	2.4
Cycle Q Clear(g_c), s	0.0	0.0	7.8	8.6	0.0	0.0				9.0	7.9	2.4
Prop In Lane	0.00		0.38	0.18		0.00				0.03		1.00
Lane Grp Cap(c), veh/h	0	0	318	316	0	0				1146	1148	1025
V/C Ratio(X)	0.00	0.00	0.66	0.50	0.00	0.00				0.45	0.41	0.15
Avail Cap(c_a), veh/h	0	0	598	592	0	0				1146	1148	1025
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	23.7	22.8	0.0	0.0				4.8	4.7	3.8
Incr Delay (d2), s/veh	0.0	0.0	2.4	1.2	0.0	0.0				1.3	1.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile Back of Q (50%), veh/ln	0.0	0.0	3.2	2.2	0.0	0.0				3.3	2.8	0.7
Lane Grp Delay (d), s/veh	0.0	0.0	26.1	24.0	0.0	0.0				6.1	5.7	4.1
Lane Grp LOS			C	C						A	A	A
Approach Vol, veh/h		211			159						1141	
Approach Delay, s/veh		26.1			24.0						5.7	
Approach LOS		C			C						A	
Timer												
Assigned Phs		4			8						6	
Phs Duration (G+Y+Rc), s		16.7			16.7						47.0	
Change Period (Y+Rc), s		5.0			5.0						5.0	
Max Green Setting (Gmax), s		23.0			23.0						42.0	
Max Q Clear Time (g_c+I1), s		9.8			10.6						11.0	
Green Ext Time (p_c), s		1.1			1.1						3.3	
Intersection Summary												
HCM 2010 Ctrl Delay			10.5									
HCM 2010 LOS			B									
Notes												

Lanes, Volumes, Timings
24: 5th St & Sarah St













Stroudsburg Boro. P.M. Peak Hour With Peds

Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	135	82	118	2	245	209	26	85	2	18	292	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	16	16	16	12	12	12	11	11	11	16	16	16
Grade (%)		-6%			7%			14%			-10%	
Storage Length (ft)	0		0	0		150	0		0	0		0
Storage Lanes	0		0	0		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.955				0.850		0.996			0.964	
Flt Protected		0.980			0.999			0.984			0.997	
Satd. Flow (prot)	0	1681	0	0	1648	1403	0	1507	0	0	1937	0
Flt Permitted		0.748			0.995			0.733			0.976	
Satd. Flow (perm)	0	1283	0	0	1642	1403	0	1122	0	0	1897	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		60				243		2			30	
Link Speed (mph)		25			35			35			35	
Link Distance (ft)		447			479			476			360	
Travel Time (s)		12.2			9.3			9.3			7.0	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.84	0.85	0.92	0.50	0.84	0.86	0.54	0.85	0.50	0.75	0.94	0.82
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)	0	0	0									
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	161	96	128	4	292	243	48	100	4	24	311	124
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	385	0	0	296	243	0	152	0	0	459	0
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Detector Phase	5	2		6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	10.5	28.5		28.5	28.5	28.5	26.0	26.0		26.0	26.0	
Total Split (s)	10.5	39.0		28.5	28.5	28.5	26.0	26.0		26.0	26.0	
Total Split (%)	16.2%	60.0%		43.8%	43.8%	43.8%	40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	5.0	33.5		23.0	23.0	23.0	19.0	19.0		19.0	19.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	5.0	5.0		5.0	5.0	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		-1.5			-1.5	-1.5		-1.5			-1.5	
Total Lost Time (s)		4.0			4.0	4.0		5.5			5.5	
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	5.0	5.0		5.0	5.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0	3.0	2.5	2.5		2.5	2.5	

Lanes, Volumes, Timings
24: 5th St & Sarah St

Stroudsburg Boro. P.M. Peak Hour With Peds
Existing Year 2013

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Time Before Reduce (s)	0.0	0.0		3.0	3.0	3.0	26.0	26.0		26.0	26.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0	0.0	10.0	10.0		10.0	10.0	
Recall Mode	None	None		None	None	None	Min	Min		Min	Min	
Walk Time (s)		11.0		11.0	11.0	11.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		12.0		12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Pedestrian Calls (#/hr)		1		1	1	1	1	1		1	1	
Act Effct Green (s)		22.8			22.8	22.8		15.7			15.7	
Actuated g/C Ratio		0.47			0.47	0.47		0.32			0.32	
v/c Ratio		0.61			0.39	0.31		0.42			0.73	
Control Delay		12.9			10.2	2.5		19.4			23.6	
Queue Delay		0.0			0.0	0.0		0.0			0.0	
Total Delay		12.9			10.2	2.5		19.4			23.6	
LOS		B			B	A		B			C	
Approach Delay		12.9			6.7			19.4			23.6	
Approach LOS		B			A			B			C	
Queue Length 50th (ft)		61			50	0		33			105	
Queue Length 95th (ft)		130			96	24		89			#280	
Internal Link Dist (ft)		367			399			396			280	
Turn Bay Length (ft)						150						
Base Capacity (vph)		969			980	935		512			881	
Starvation Cap Reductn		0			0	0		0			0	
Spillback Cap Reductn		0			0	0		0			0	
Storage Cap Reductn		0			0	0		0			0	
Reduced v/c Ratio		0.40			0.30	0.26		0.30			0.52	

Intersection Summary

Area Type: CBD

Cycle Length: 65

Actuated Cycle Length: 48.8

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 14.6

Intersection LOS: B

Intersection Capacity Utilization 73.0%





ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 24: 5th St & Sarah St

 ø2	 ø4
39 s	26 s
 ø5	 ø6
10.5 s	26 s
28.5 s	

HCM 2010 analysis expects stop-line detection. Detectors can not be further than 20 feet from the stop bar.